

# The Relationship between Type D Personality and Gastrointestinal Symptom Levels in Patients with Irritable Bowel Syndrome

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## ABSTRACT

**Objective:** The aim of this descriptive and cross-sectional study was to examine the relationship between type D personality and gastrointestinal symptoms in patients with irritable bowel syndrome (IBS).

**Methods:** A total of 168 of 192 patients who presented at the gastroenterology polyclinic of a university hospital between February 15 and May 15, 2019 and were diagnosed with IBS were enrolled. The data were collected using a patient identification form, the Gastrointestinal Symptom Rating Scale (GSRS), and the Type D Scale-14 (DS-14) personality assessment.

**Results:** Of the IBS patients studied, 70.8% had type D personality. The GSRS total score of the patients with type D personality ( $p=0.001$ ), as well as their reflux ( $p=0.001$ ), diarrhea ( $p=0.01$ ), abdominal pain ( $p=0.001$ ), constipation ( $p=0.001$ ), and indigestion ( $p=0.004$ ) sub-dimension scores were statistically significantly higher than those without type D personality. Multiple regression analysis indicated that the GSRS total score and all subdimension scores except reflux had a predictive value of 20% ( $R^2=0.203$ ;  $p<0.0001$ ).

**Conclusion:** In all, 70.8% of individuals diagnosed with IBS were classified as type D personality. The gastrointestinal symptoms of abdominal pain, reflux, diarrhea, indigestion, and constipation were more prevalent among individuals with type D personality compared with other personality types.

## INTRODUCTION

Irritable bowel syndrome (IBS) is one of the leading causes of primary care doctor visits, and is also the most common diagnosis in gastroenterology outpatient clinics. The precise role of symptoms in subjects with IBS seeking healthcare treatment continues to be a source of discussion. IBS is a chronic, functional digestive system disease that is characterized by abdominal pain or discomfort and changes in bowel habits with generally normal physical examination and pathology laboratory findings.<sup>[1-4]</sup> Symptoms such as increased frequency of bowel movements with abdominal pain, decrease in pain and relief after defecation, abdominal swelling, a feeling of incomplete bowel evacuation, and complaints of mucus in the rectum are widely seen.<sup>[5]</sup> IBS constitutes 12% of the diagnoses made by primary care physicians and 25% to 50% of these patients are referred to gastroenterologists, and IBS represents 28% to 36% of the diagnoses made by gastroenterologists.

<sup>[6,7]</sup> Comorbid somatic diseases, such as fibromyalgia or chronic fatigue, are common in people diagnosed with IBS, as well as psychiatric disorders, such as anxiety and depression.<sup>[8]</sup> A review of the literature revealed several studies that have examined the relationship between IBS and psychological factors and that personality characteristics have been found to play a role in IBS.<sup>[9,10]</sup> One study noted that 40.7% of IBS patients had type D personality, which is characterized by depression, anxiety, unhappiness, fatigue, exhaustion, and unwillingness. The authors observed that type D personality was associated with increased symptom severity and reduced quality of life in IBS patients.<sup>[10]</sup> A negative affect and social introversion are prominent characteristics of type D personality. These individuals typically experience a high level of emotional distress, suppress their feelings, are prone to have more physical symptoms, and have a poorer response to illness.<sup>[11]</sup> In addition, people with type D personality are more vulnerable to stress. Although the underlying mechanisms

are not clear, stress is thought to increase the inflammatory response, alter the functioning of immune cells, and increase vulnerability to infectious and systemic diseases.<sup>[11,12]</sup> Thus, stress can play an important role in the course of disease and its consequences. Healthcare professionals, especially doctors and nurses working in community health, should be mindful of the effect of personality types on psychological and physical health.

To the best of our knowledge, there are no published studies on the relationship between type D personality and the gastrointestinal symptoms widely seen among IBS patients. The objective of this study was to examine the relationship between type D personality characteristics and gastrointestinal symptoms in IBS patients.

## MATERIALS AND METHODS

### Study Design, Setting, and Population Sample

This descriptive and cross-sectional study was an analysis of IBS outpatients of the gastroenterology clinic of a university hospital. An average of 4 outpatients diagnosed with IBS present at the gastroenterology clinic per day. The study population consisted of 192 outpatients diagnosed with IBS who presented at the clinic between February 15 and May 15, 2019. The final sample consisted of 168 patients. The inclusion criteria were fulfillment of the Rome IV criteria for IBS,  $\geq 18$  years of age, ability to communicate with the researchers, and willingness to participate in the study. Patients were excluded if they had an organic gastrointestinal disorder, a serious illness that decreased life expectancy, a major cognitive or psychiatric disorder, or antidepressant medication use.

### Data Collection Tools

The study data were collected using a patient identification form, the Gastrointestinal Symptom Rating Scale (GSRS), and the Type D Scale-14 (DS-14) personality assessment tool. The GSRS was developed to evaluate the symptoms widely reported in gastrointestinal system disorders. The reliability and validity of the GSRS were established by Revicki et al.<sup>[13]</sup> and the Turkish version was evaluated by Turan et al.<sup>[14]</sup> The GSRS assesses how the individual felt within the previous week with regard to gastrointestinal symptom clusters. The scale consists of 15 items divided into 5 subdimensions: reflux (2 items), indigestion (4 items), diarrhea (3 items), constipation (3 items), and abdominal pain (3 items). A higher score indicates more severe symptoms. Turan et al.<sup>[14]</sup> determined a Cronbach alpha value of 0.82. In this study, the Cronbach alpha value of the GSRS was found to be 0.89.

The DS-14 developed by Denollet<sup>[15]</sup> consists of 14 items and was specifically to evaluate type D personality. The scale includes 2 subdimensions consisting of 7 items each to measure negative affect and social inhibition. A Likert-type scale is used to score each item between 0 and 4. The total score can vary between 0 and 28 in each subdi-

mension. The cutoff point of both subdimensions is  $\geq 10$ . A validity and reliability study of the Turkish scale was performed by Alçelik et al.<sup>[16]</sup> In the current study, the Cronbach alpha value of the scale was 0.86.

### Statistical Analysis

IBM SPSS Statistics for Windows, Version 19.0 software (IBM Corp., Armonk, NY, USA) was used to analyze the study data. Skewness and kurtosis values indicated normal distribution. The data were described and analyzed using percentages, mean values, SD, a t-test, a chi-squared test, and regression analysis.

### Ethical Considerations

Permission for this study was granted by the Zonguldak Bulent Ecevit University Clinical Research Ethics Committee on February 6, 2019 (no: 2019/03). All of the patients provided written, informed consent.

## RESULTS

The distribution of the GSRS total and subdimension scores is given in Table 1. The mean total GSRS score of the patients was  $51.4 \pm 15.7$ , indicating a moderate level of symptom severity. The mean subdimension score was  $6.7 \pm 3.0$  for reflux,  $9.5 \pm 4.4$  for diarrhea,  $9.8 \pm 3.5$  for abdominal pain,  $10.5 \pm 4.6$  for constipation, and  $14.8 \pm 5.0$  for indigestion. In all, 70.8% of the patients had type D personality ( $n=119$ ).

The distribution of the sociodemographic and medical characteristics of patients with and without type D personality can be seen in Table 2. No statistically significant difference between patients with and without type D personality was seen for variables of age, sex, marital status, education level, income level, occupation, disease duration, the presence of an additional chronic disease, or regular check-ups ( $p>0.05$ ).

The distribution of the GSRS total and subdimension scores of the IBS patients according to the DS-14 is provided in Table 3. The total GSRS score of the patients with type D personality ( $p=0.001$ ), as well as the reflux ( $p=0.001$ ), diarrhea ( $p=0.01$ ), abdominal pain ( $p=0.001$ ),

**Table 1.** The distribution of the GSRS total and sub dimension scores of IBS patients

Scales	Mean $\pm$ SD
GSRS total	51.43 $\pm$ 15.70 (0–88)
Reflux	6.72 $\pm$ 3.02 (0–14)
Diarrhea	9.54 $\pm$ 4.47 (0–21)
Abdominal pain	9.82 $\pm$ 3.54 (0–19)
Constipation	10.50 $\pm$ 4.64 (0–21)
Indigestion	14.83 $\pm$ 5 (0–27)

GSRS: Gastrointestinal Symptom Rating Scale; IBS: Irritable bowel syndrome; SD: Standard deviation.

**Table 2.** Distribution of the sociodemographic and certain medical characteristics of IBS patients according to personality type (n=168)

Variables	Non-type D personality (n=49)	Type D personality (n=119)	p <sup>x</sup>
Age (years)			
18–39	21 (29.2)	51 (70.8)	=0.11
≥40	28 (29.2)	68 (70.8)	
Gender			
Female	26 (27.4)	69 (72.6)	=0.55
Male	23 (31.5)	50 (68.5)	
Marital status			
Married	24 (24.2)	75 (75.8)	=0.09
Single	25 (36.2)	44 (63.8)	
Education			
Illiterate	4 (21.1)	15 (78.9)	=0.08
Literate	7 (63.6)	4 (36.4)	
Elementary school	11 (23.9)	35 (76.1)	
High school	12 (26.7)	33 (73.3)	
Bachelor's and above	15 (31.9)	32 (68.1)	
Level of income			
Poor	30 (30.0)	70 (70.0)	=0.68
Moderate	12 (25.0)	36 (75.0)	
Good	7 (35.0)	13 (65.0)	
Occupation			
Unemployed	7 (46.7)	8 (53.3)	=0.26
Housewife	11 (24.4)	34 (75.6)	
Laborer	8 (33.3)	16 (66.7)	
Officer	8 (18.6)	35 (81.4)	
Retired	8 (34.8)	15 (65.2)	
Self-employed	7 (38.9)	11 (61.1)	
Disease duration			
1–5 years	34 (32.1)	72 (67.9)	=0.54
6–10 years	8 (20.0)	32 (80.0)	
11–16 years	4 (30.8)	9 (69.2)	
≥17 years	3 (33.3)	6 (66.7)	
Additional chronic disease			
Yes	15 (27.3)	40 (72.7)	=0.70
No	34 (30.1)	79 (69.9)	
Regular check-ups			
Yes	23 (31.9)	49 (68.1)	=0.49
No	26 (27.1)	70 (72.9)	

\*p&lt;0.05; x: chi-squared test.

constipation ( $p=0.001$ ), and indigestion ( $p=0.004$ ) subdimension scores were statistically significantly higher than those without type D personality. Multiple regression analysis revealed that the GSRs total score and all subdimension scores with the exception of the reflux subscale were significant predictors of type D personality, explaining 20% of the total variance ( $R^2=0.203$ ;  $p<0.0001$ ) (Table 4).

## DISCUSSION

Several studies have reported a high incidence of psychological symptoms and psychiatric comorbidity in IBS, which

suggests that they may be relevant to this disease. However, there are only a limited number of studies that have examined personality structure and personality characteristics in relation to IBS.<sup>[10]</sup> Personality has an important role in determining behavior and habits that can affect health and the disease process. A negative affect and social introversion are principal features of type D personality. These individuals are at higher risk for depression, experience significant levels of anxiety and stress, typically suppress their emotions, and frequently have a poorer reaction to illness than other personality types.<sup>[17,18]</sup> Individuals with type D personality experience greater cortisol reactivity

**Table 3.** Distribution of the GRS total and sub dimension scores of IBS patients according to the type D Personality Scale (n=168)

Scales	Type D (n=119)	Non type D (n=49)	p
Reflux	11.15±4.38	8.82±4.97	**0.001 <sup>‡</sup>
Diarrhea	10.05±4.29	8.19±4.74	*0.01 <sup>‡</sup>
Abdominal pain	10.75±3.37	7.44±2.80	**0.001 <sup>‡</sup>
Constipation	8.82±4.97	11.15±4.38	**0.001 <sup>‡</sup>
Indigestion	15.97±4.77	12.00±4.55	**0.004 <sup>‡</sup>
GSRs total	55.36±14.98	41.44±13.15	**0.001 <sup>‡</sup>

\*p<0.05; \*\*p<0.001; <sup>‡</sup>T-test. GSRs: Gastrointestinal Symptom Rating Scale; IBS: Irritable bowel syndrome.

**Table 4.** Regression analysis examination of the GRS total and subdimension scores according to type D personality status (n=168)

Type D personality	B	Beta	t	p
Constant	0.120		1.059	0.291
Abdominal pain	0.114	0.879	2.919	0.004**
Reflux	0.076	0.502	1.815	0.05
Diarrhea	0.070	0.684	1.915	0.04*
Indigestion	0.079	0.862	2.009	0.04*
Constipation	0.072	0.728	1.925	0.04*
GSRs total	-0.071	-2.418	-1.908	0.04*

R=0.450 R<sup>2</sup>=0.203 F=6.831 p=0.000\*\*

\*p<0.05; \*\*p<0.001. GSRs: Gastrointestinal Symptom Rating Scale; IBS: Irritable bowel syndrome.

to stress and are more inclined to psychological distress.<sup>[10]</sup> In this study, most of the patients (70.8%) were found to have type D personality. There were no significant differences between patients with and without type D personality with regard to sociodemographic characteristics. Sararoudi et al.<sup>[10]</sup> reported a rate of type D personality of 40.7% among IBS patients controlled for sociodemographic characteristics and that it appeared to have a notable effect on quality of life. Hansel et al.<sup>[19]</sup> examined personality characteristics and quality of life in patients with functional gastrointestinal disorders and reported a type D personality rate of 37%.<sup>[19]</sup> They found no significant difference between patients with and without type D personality with regard to sociodemographic characteristics, with the exception of age. Our results were consistent with the findings of these studies.

We found that type D personality was associated with the total GSRs score and all of the subdimension scores (reflux, diarrhea, abdominal pain, constipation, indigestion). Multiple regression analysis indicated that the GSRs total score and all of the subdimension scores except the reflux score were significant predictors of type D personality, explaining 20% of the total variance (R<sup>2</sup>=0.203; p<0.0001). It

has been well established that a negative affect can increase colonic motility and that this effect is more pronounced in IBS patients. High levels of neuroticism, anxiety sensitivity, and sensitivity to visceral perceptions are common characteristics of IBS patients and also predictors of IBS symptoms.<sup>[17]</sup> Thus, the close relationship between the digestive tract and emotional status has led to the acceptance of IBS as a functional gastroenterological disease.<sup>[20]</sup> Our findings indicate higher symptom severity in patients with type D personality compared to patients without type D personality. IBS symptoms can occur during periods of stress and emotional distress, and emotional stress can cause bowel hypermotility. Erdoğan and Kurcer<sup>[8]</sup> studied IBS patients and observed that depression and hopelessness were especially high in patients with constipation, while in a study that examined individuals ≥20 years of age, Haug et al.<sup>[21]</sup> found a relationship between depression and constipation, diarrhea, and heartburn. Gorard et al.<sup>[22]</sup> also demonstrated a relationship between depression and increased intestinal transit time. In studies of the basic pathophysiological and symptomatic correlates of IBS, negative emotions such as anger, anxiety, and depression have been analyzed most often.<sup>[23]</sup> These negative emotions are widely observed widely individuals with type D personality. The fact that type D personality was found in 70.8% of this study group suggests a relationship to IBS. Type D personality would appear to be an important factor not only in cases of cardiovascular disease, but other medical conditions as well, including IBS.

## CONCLUSION

In this study, 70.8% of the IBS patients had type D personality. Gastrointestinal symptoms of abdominal pain, reflux, diarrhea, indigestion, and constipation were found to be more common among individuals with type D personality compared with those with another personality type. Healthcare professionals must explain to patients that IBS is a chronic condition without definitive treatment, that there may be changes in the symptoms from time to time, and that the treatment focuses on the alleviation of symptoms. IBS patients who are thoroughly informed in a primary care appointment may lead to fewer hospital visits.

Given that IBS is a chronic disease and that the physical and laboratory findings underlying the complaints are not clear, personality type should be a consideration in the evaluation of gastrointestinal symptoms. The relationship we found between gastrointestinal symptoms and type D personality should be further examined in studies with larger samples, and the findings should be considered in treatment planning.

## Study limitations

The results are based on cross-sectional data; therefore, a causal relationship between variables cannot be inferred. Longitudinal research is needed to thoroughly examine the relationship between study variables.

### Ethics Committee Approval

This study was approved by the Zonguldak Bülent Ecevit University Clinical Research Ethics Committee (6 February 2019, no: 2019/03).

### Peer-review

Internally peer-reviewed.

### Authorship Contributions

Concept: Z.E., M.A.K.; Design: Z.E., M.A.K.; Supervision: Z.E., M.A.K., Z.Ö.; Data: Z.E., M.A.K., Z.Ö.; Analysis: Z.E., Z.Ö.; Literature search: Z.E., M.A.K., Z.Ö.; Writing: Z.E.; Critical revision: Z.E., M.A.K.

### Conflict of Interest

None declared.

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## Irritable Bağırsak Sendromu Olan Hastalarda D Tipi Kişilik Özelliklerinin Gastrointestinal Semptom Düzeyiyle İlişkisi

**Amaç:** Tanımlayıcı ve kesitsel tipteki bu çalışmanın amacı, irritable bağırsak sendromu (IBS) hastalarında D tipi kişilik ile gastrointestinal semptomlar arasındaki ilişkiyi ortaya koymaktır.

**Gereç ve Yöntem:** Bu çalışma, bir üniversite hastanesinin gastroenteroloji polikliniğinde IBS tanısı alan hastalarla yapıldı. Çalışmanın evrenini, 15 Şubat 2019 ve 15 Mayıs 2019 tarihleri arasında poliklinikte IBS tanısı konan 192 hasta, örneklemini 168 hasta oluşturdu. Veriler bir Hasta Tanıtım Formu, Gastrointestinal Semptom Derecelendirme Ölçeği (GSRs) ve D-14 Kişilik Tipi Ölçeği (DS-14) kullanılarak toplandı.

**Bulgular:** Irritable bağırsak sendromu hastalarının %70.8'inde tip D kişiliği vardır. D Tipi kişiliğe sahip olan hastaların GSRs toplam puanı ( $p < 0.0001$ ) ve alt boyutlarından reflü ( $p < 0.0001$ ), diyare ( $p = 0.01$ ), karın ağrısı ( $p = 0.001$ ), konstipasyon ( $p = 0.001$ ), hazımsızlık ( $p = 0.004$ ) puanları D tipi kişiliğe sahip olmayan hastalara göre anlamlı derecede yüksekti. Çoklu regresyon analizi yapıldığında; reflü hariç tüm alt boyut ve GSDÖ toplam puanının %20 oranında ( $R^2 = 0.203$ ,  $p = 0.000$ ) belirleyicilik rolü olduğu bulunmuştur.

**Sonuç:** Bu çalışmada IBS tanısı alan bireylerde D tipi kişilik oranının %70.8 olduğu, gastrointestinal semptomlardan karın ağrısı, reflü, diyare, hazımsızlık ve konstipasyonun D tipi kişiliği olan bireylerde olmayanlara göre daha fazla görüldüğü saptandı.

**Anahtar Sözcükler:** D tipi kişilik; gastrointestinal semptom; gastrointestinal sistem; irritable bağırsak sendromu.