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Evaluation of personality traits in patients with functional gastrointestinal disorders

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Abstract

Introduction: Functional GastroIntestinal Disorders (FGIDs) represent the most prevalent condition in patients who come to medical clinics with abdominal symptoms. Several studies have shown that psychiatric comorbidity, including mood and anxiety disorders, is highly prevalent in patients with FGIDs. Personality traits can cause functional symptoms in a variety of diseases. However, limited studies have assessed personality characteristics in FGIDs patients. Therefore, the purpose of the present research was to compare personality traits between patients with FGIDs and healthy people based on the five-factor personality model.

Materials and Methods: In this case-control study, 40 patients referred to the psychosomatic clinic of Booali Sina Hospital, Qazvin, Iran, from September 2019 to March 2020 and diagnosed as FGIDs and 40 healthy individuals were participated. After a clinical interview with a psychiatrist, all participants completed the NEO-Five Factor Inventory (NEO-FFI). The data was analyzed using Chi-square test, independent t-test, and the Pearson correlation test.

Results: The results showed that the mean neuroticism score in patients with FGIDs was significantly higher than that of healthy individuals (P= 0.000). Also, FGID cases had significantly lower extraversion (P= 0.000), conscientiousness (P= 0.005), openness to experiences (P= 0.023), and agreeableness (P= 0.000) scores compared to healthy subjects.

Conclusion: The results of this research indicated personality differences between patients with functional gastrointestinal disorders and healthy individuals. If further studies confirm this finding, new psychological interventions focused on personality characteristics may be introduced to treat functional gastrointestinal disorders.

Keywords: Dyspepsia, Functional gastrointestinal disorders, Irritable bowel syndrome, Personality

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Introduction

Functional GastroIntestinal Disorders (FGIDs) represent the most prevalent condition in subjects who come to medical clinics with abdominal symptoms. FGIDs are characterized by various combinations of cyclical and chronic abdominal symptoms not explained by marked biochemical or structural abnormalities. Irritable Bowel Syndrome (IBS) and Functional Dyspepsia (FD) are the most recognized FGIDs (1). FGIDs impose a considerable health burden. These disorders are associated with significant impairment of quality of life and increased healthcare costs (2-5). Limited information exists on the etiology and pathophysiology of FGIDs. To justify these disorders, a multifactorial model, which includes the interactions of biological, social, and psychological factors, is used (4,5).

Several studies have shown that psychiatric comorbidity, including mood and anxiety disorders, is highly prevalent in patients with FGIDs. This comorbidity suggests the complex connection between the brain and gut, which is named the brain-gut axis. This interaction between the enteric and central nervous systems depends on immune, neural, and endocrine pathways (6-12). Limited studies have assessed personality characteristics in FGID patients (13). Personality is described as the combination of consistent and unique behaviors, thinking, and emotion patterns (14). It can affect the severity, duration, and reaction to pain. Personality traits can cause functional symptoms in various diseases (13-15).

A five-factor model of personality categorizes personality characteristics into five dimensions: neuroticism (vulnerability to experiencing negative emotions and psychological distress in reaction to stressful events), extraversion (level of sociability, assertiveness, positive emotionality, excitement seeking, and general activity), agreeableness (altruistic, sympathetic, and cooperative tendencies), conscientiousness (level of self-control in organization and planning), and openness to experience (level of curiosity, creativity, independent judgment, and imagination). This model has been broadly approved because the structure of traits is consistent among different cultures with various languages (13). Some research has been conducted on evaluating personality traits in FGID patients based on the five-factor personality model. However, in Iran, studies are limited; most have examined personality traits in IBS, and studies on other FGIDs are much more limited (2). Farnam et al. examined 166 patients with IBS. They showed that they had significantly higher levels of neuroticism, conscientiousness, and lower levels of openness to experience and agreeableness compared to the general population. In this study, the extraversion score did not significantly differ between patients with IBS and the general population (16). In a study conducted by Palmer et al., in 41 IBS patients and 2000 healthy individuals using the Maudsley personality inventory, IBS patients had significantly higher levels of neuroticism and lower levels of extraversion than healthy individuals (17). Faramarzi et al. evaluated 60 FD patients and 60 healthy individuals, demonstrating that patients with FD had significantly higher scores on neuroticism and more openness to experience than healthy individuals. The two groups had no significant difference in extraversion, agreeableness, and conscientiousness scores (4).

Jamshidbeigi et al. examined the relationship between dyspepsia, quality of life, and personality traits in 50 patients with indigestion, and found that dyspepsia reduces the quality of life and affects individuals' personality traits (18). Ma et al. investigated the relationship between gastrointestinal symptoms in FGID patients and D-type personality and emotion regulation strategies. Their results showed that negative affectivity emerges as a key predictor, positively associated with symptom severity, whereas social inhibition correlates negatively with abdominal pain (19).

Sundas et al. investigated the relationship between psychosocial quality of life in functional gastrointestinal disorders in 52 patients. They concluded that psychological factors, especially depression, significantly contribute to poor quality of life in those patients and should be addressed in a holistic, multidisciplinary way (20). Therefore, the purpose of the present research was to compare personality traits between patients with FGIDs and healthy people using the five-factor personality model.

Materials and Methods

This case-control study was performed on 40 patients referred to the psychosomatic clinic of Booali Sina Hospital, Qazvin, Iran, from September 2019 to March 2020 and diagnosed as FGIDs according to Rome IV diagnostic criteria after excluding organic gastrointestinal

disorders. The sample size was calculated based on formula and previous studies (4). Participants in the control group were selected from those who accompanied the patients admitted to the clinic. Forty healthy persons matched with the case group regarding age, gender, and education were included in this research. These participants in the control group had no gastrointestinal diseases and did not suffer from any abdominal symptoms.

Inclusion criteria were diagnosed FGID based on Rome IV criteria, age 20-60 years, reading and writing ability, and the absence of organic gastrointestinal disorder. Exclusion criteria were history of severe medical and psychiatric disorders (psychosis, substance use disorders, mental retardation, dementia, anxiety, depression), and having warning abdominal symptoms such as weight loss, gastrointestinal bleeding, and difficulty swallowing.

Research instruments

A) Demographic data: It includes age, gender, education, marital status, and place of living. In the case group, a history of abdominal symptoms such as nausea, vomiting, bloating, diarrhea, constipation, tenesmus, burping, and postprandial fullness.

B) Visual Analogue Scale (VAS): VAS is a 10-centimeter (100 mm) long horizontal line with two descriptors at each end to show the extremes of the feeling. Respondents marked the point on the line that matched their pain intensity. Pain intensity is scaled from zero as "no pain" to 100 as "the worst pain". It was used to assess the abdominal pain intensity over the past week was assessed by.

C) The NEO Five-Factor Personality Inventory: It was designed by Costa and McCrae in 1989 to measure the five main factors of personality (21). The NEO-FFI contains 60 self-descriptive items about five personality dimensions: neuroticism, extraversion, agreeableness, openness to experiences, and conscientiousness. Each dimension consists of 12 items, and respondents find out how much they agree or disagree with each item on a five-point Likert scale (0= completely disagree, 4= completely agree). Eight items are scored reversely (13). The validity and reliability of the original NEO-FFI have been evaluated as acceptable in studies (22,23). The validity and reliability of its Persian version have been evaluated as acceptable in studies. The Cronbach's alpha coefficients for neuroticism, agreeableness, extraversion, openness to experiences, and conscientiousness were 0.86, 0.68, 0.73, 0.56, and 0.87, respectively (21,24).

After data collection, the comparison and determination of differences in personality traits between the case and control groups were performed using Chi-square tests and independent t-tests. Statistical analysis was done with SPSS software version 20. The relationship between quantitative variables was analyzed using the Pearson correlation test.

Results

This study evaluated 40 patients with FGIDs and 40 healthy individuals. The mean age of participants in the FGIDs group was 38.50 ± 11.50 years and 30.40 ± 8.50 years in the healthy group. The FGIDs group included 16 (40%) men and 24 (60%) women, and the healthy group included 20 (50%) women and 20 (50%) men. In the FGIDs group, 19 people (47.5%) were diagnosed with Irritable Bowel Syndrome (IBS), and 21 people (52.5%) were diagnosed with Functional Dyspepsia (FD). Table 1 shows the demographic characteristics of the study participants. The two groups did not differ significantly in age, gender, marital status, place of living, and education (P> 0.05).

Table 1. Demographic characteristics of the study population

Variable		FGIDs patients	Healthy individuals	P
Age (Year)		38.50 ± 11.50	30.40 ± 8.50	0.76
Marital status	Single	21 (52.5%)	23 (57.5%)	0.85
	Married	19 (47.5%)	17 (42.5%)	0.91
Gender	Female	24 (60%)	20(50%)	0.77
	Male	16 (40%)	20(50%)	0.74
Place of living	Urban	17 (42.5 %)	18 (45%)	0.83
	Rural	23 (57.5%)	22 (55%)	0.87
Education (Year)		13.4 ± 2.30	12.80 ± 2.20	0.77

Table 2 and Figure 1 (B) show the mean and standard deviation of the five personality dimensions scores in patients with FGIDs and healthy individuals. The results showed that the mean score of neuroticism in patients with FGIDs was significantly higher than that of healthy people. FGID cases had significantly lower agreeableness, extraversion, conscientiousness, and openness to experiences scores compared to healthy subjects.

Table 2. Mean and standard deviation of personality dimensions scores in FGID patients and healthy individuals

Variable	FGIDs patients (Mean ± SD)	Healthy individuals (Mean ± SD)	P
Neuroticism	28.90±7.60	21.40±7.30	0.000
Extroversion	22.40±7.60	28.30±5.60	0.000
Openness	23.8±6.02	26.90±5.80	0.023
Agreeableness	24.60±6.20	29.70±5.80	0.000
Conscientiousness	28.50±8.20	33.50±7.01	0.005

Table 3 presents the mean and standard deviation of the five personality dimensions scores in patients with IBS and FD. Comparing these scores between the two groups demonstrated that the scores of all five personality dimensions were not significantly different between IBS and FD patients ($P>0.05$). Table 3 and Figure 1 (A) show the scores of personality dimensions between patients with various subtypes of FGIDs and healthy individuals.

The results were similar to the findings of a comparison between FGID patients and healthy persons, except that the score of openness to experiences was not significantly different between IBS patients and healthy persons.

Table 3. Mean and standard deviation of personality dimensions scores in IBS and FD patients and healthy individuals

Variable	IBS patients (Mean ± SD)	Dyspepsia patients (Mean ± SD)	Healthy (Mean ± SD)	P (IBS vs FD)	P (IBS vs control)	P (FD vs control)
Neuroticism	29.80 ± 8.70	28.10 ± 6.60	21.40 ± 7.30	0.25	0.001	0.001
Extroversion	21.00 ± 6.50	23.80 ± 8.50	28.30 ± 5.60	0.66	0.000	0.040
Openness	24.20 ± 5.10	23.40 ± 6.80	26.90 ± 5.80	0.65	0.080	0.040
Agreeableness	24.80 ± 5.70	24.40 ± 6.70	29.70 ± 5.80	0.78	0.005	0.005
Conscientiousness	29.10 ± 7.40	28.00 ± 8.90	33.50 ± 7.01	0.67	0.030	0.020

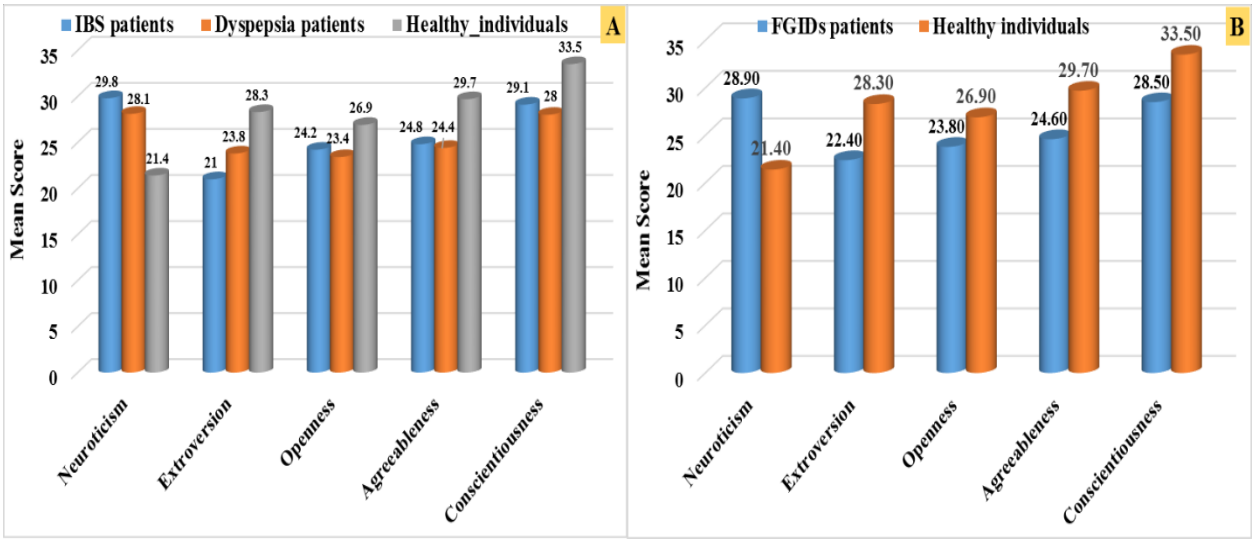

Figure 1. Mean of personality traits scores, A; between IBS, FD, and control group, B; patient group and control group

The mean score of abdominal pain intensity according VAS in FGIDs patients was 46. The relationship between abdominal pain intensity and the scores of personality traits using Pearson's test is shown in Table 4. The values obtained from the Pearson's correlation test showed no significant relationship between pain intensity and personality traits, including neuroticism, extroversion, openness, agreeableness, and conscientiousness. The highest correlation between pain intensity and personality traits was obtained for neuroticism, with a value of 0.24, and the lowest correlation was obtained for conscientiousness. In contrast, the relationship between pain intensity and extroversion was inverse at -0.218. Also, the P-value obtained between pain intensity and personality traits showed no significant relationship between the personality traits of patients and their pain intensity ($P > 0.05$).

Table 4. Investigating the relationship between pain intensity and personality traits scores in patients with functional gastrointestinal disorders

Personality traits	Pearson's correlation coefficient	P
Neuroticism	0.243	0.135
Extroversion	-0.218	0.182
Openness	0.195	0.235
agreeableness	0.148	0.369
Conscientiousness	0.018	0.913

Discussion

This study was designed to compare the personality characteristics of FGID patients with healthy persons. In our study, FGID patients had a higher level of neuroticism than healthy persons. This finding is consistent with the results of previous research (4,5,11).

The mechanisms underlying the relationship of neuroticism with FGIDs are not precise. However, some explanations may describe this relationship. Vulnerability to negative emotional experiences such as anxiety, anger, and depression is one of the core ingredients of neuroticism. Negative emotionality causes persons to cope with adverse conditions with intensified stress. Some research suggests that people with a high level of neuroticism have more sympathetic nervous system reactivity. The intestinal nervous system is exceedingly sensitive to emotional patterns. These negative emotions can change intestinal motility, which can cause abdominal symptoms similar to those of FGIDs (6,25). On the other hand, neuroticism is related to an increased risk of depression and anxiety, which can exacerbate symptoms of FGIDs (14,26). Findings of our study also declared that FGIDs patients had lower extroversion than healthy people. Previous studies demonstrated similar results (4,5). Extrovert individuals experience a positive emotional pattern and a capacity to develop social interests and interpersonal relationships. Positive emotions help extrovert people respond to stressful situations both psychologically and physiologically. Extroversion increases flexible thinking and a range of behavioral responses in stressful conditions. Moreover, extrovert individuals benefit from effective interpersonal support as a protective factor in stressful events. All these characteristics increase extrovert persons' capacity to overcome adversities (6,25,27,28) effectively.

Our results also indicated that FGID patients, compared to healthy individuals, scored lower in openness to experiences, conscientiousness, and agreeableness. The results of previous studies about the relationship between these three dimensions and FGIDs are inconclusive (27). Sharbafchi in a study conducted on 4763 individuals from the general population, found that lower openness to experiences, conscientiousness, and agreeableness scores were associated with higher risk of FD (15).

Farnam et al. examined 166 patients with IBS. They showed significantly higher conscientiousness levels and lower openness to experiences and agreeableness in IBS patients compared to the general population (29). The findings of the study by Zarpour demonstrated that the IBS group (60 patients), compared to healthy individuals (104 people), scored lower in conscientiousness. However, the two groups had no significant difference between agreeableness and openness scores (13). Ghasemi evaluated 35 IBS patients and 35 healthy individuals and declared that no significant differences were found in openness to experiences, agreeableness, and conscientiousness between the two groups (30). Therefore, further studies are needed to

determine the relationship between these three personality dimensions and FGIDs. In our study, personality dimensions exhibited a similar pattern in IBS and FD patients. Some patients with FGIDs have symptoms of both IBS and FD simultaneously. With regard to the overlap between the symptoms of IBS and FD, this finding is predictable. Until now, very limited research has compared personality traits between these two groups. Wrzesińska showed that conscientiousness differed between IBS and FD patients (31). Further studies in this field can illustrate the similarities and differences between the personality traits of these two disorders.

One of the strengths of this study is it focuses separately on personality traits in FD and IBS patients. The study compares these two patient groups together, and it also compares them with healthy people.

The other strength of the study is using the NEO-FFI test because the structure of personality traits according to this questionnaire is consistent among different cultures with various languages. The limitation of this study is that it does not evaluate the other FGID subgroups except IBS and FD. However, in future studies, by considering the other FGID subgroups, more information will be found about personality traits in FGIDs.

Conclusion

The results of this research indicated personality differences between patients with functional gastrointestinal disorders and healthy individuals. If further studies confirm this finding, new psychological interventions focused on personality characteristics may be introduced to treat functional gastrointestinal disorders.

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Conflict of Interest

The authors declare no conflict of interest related to this study.

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Ethical Considerations

The study protocol was approved by the ethics committee of Qazvin University of Medical Sciences and informed consent was obtained from all the participants.

Code of Ethics

IR.QUMS.REC.1396.177

Authors' Contributions

FZ: Visualization, conceptualization, investigation, data curation, and writing, reviewing, and editing the manuscript; HJ: Methodology, visualization, conceptualization, acquisition, analysis, interpretation of data, SH.R: Acquisition of data, writing the manuscript, BR: Visualization, conceptualization, investigation, writing, reviewing, and editing the manuscript.

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