



Anxiety Sensitivity and Metacognition in Iranian Patients with Functional Gastrointestinal Disorders and Healthy Individuals

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Quantitative Study

Abstract

Background: Psychosomatic disorders are a group of psychiatric disorders in which psychological factors play an important role in the development, maintenance, and exacerbation of medical conditions. The most important category of psychosomatic disorders is functional gastrointestinal disorders (FGID). The present study aimed to compare anxiety sensitivity (AS) and metacognitions between patients with FGID and healthy individuals in Isfahan, Iran.

Methods: This case-control study was conducted on 50 patients (13 men and 37 women) with FGID who were diagnosed by a gastroenterologist and had the study inclusion criteria and 50 matched healthy individuals (15 men and 35 women). The subjects were randomly selected. The data collection tools consisted of the Anxiety Sensitivity Index-Revised (ASI-R) and Metacognitive Beliefs Questionnaire (MCQ-30). The data were analyzed in SPSS software.

Results: The results showed that there were significant differences in all subscales of ASI-R and MCQ-30, except the fear of publicly observable symptoms subscale in the ASI-R and negative beliefs about the uncontrollability of thoughts and corresponding danger (UD) subscale in MCQ-30 between patients with FGID and healthy individuals.

Conclusion: The results showed that AS and metacognitive beliefs about worry play a crucial role in psychosomatic disorders such as FGID. Anxiety has appeared as the common component between FGID. Hence, the management of anxiety in FGID by clinicians in the treatment of these disorders is recommended.

Keywords: Psychosomatic disorder, Anxiety sensitivity (AS), Metacognitive beliefs, Functional gastrointestinal disorders

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Introduction

Functional gastrointestinal disorders (FGID) is a category of psychosomatic disorders with the first rank among medical disorders associated with psychiatric consultation (Sadock & Sadock, 2007). FGID accounts for about 50% of patients referred to gastrointestinal diseases service centers in Iran (Mazaheri, Afshar, Weinland, Mohammadi, & Adibi, 2012).

These functional disorders are often associated with affective disorders (depression and anxiety), which indicates a relationship between the pathophysiologic mechanisms of affective disorders and the digestive system (Mayer, Craske, & Naliboff, 2001; Naliboff et al., 2012).

In recent years, the concept of anxiety sensitivity (AS) has attracted much attention as a mediator in a significant number of emotional disorders, anxiety disorders, somatic symptom disorders, and psychosomatic disorders (Stewart, Watt, & Taylor, 2009; Sabourin, Stewart, Watt, & Krigolson, 2015). AS has been defined as excessive fear of anxiety-related sensations (e.g., blushing, tachycardia, dizziness) and the individual's belief about the potential physical, psychological, and social traumatic consequences of these symptoms (Olatunji & Wolitzky-Taylor, 2009; Taylor et al., 2007).

AS induces fear of the emotions related to anxiety and its gastrointestinal symptoms. Negative cognitive appraisal plays a role in the establishment and maintenance of anxiety and stress which, in turn, exacerbate psychosomatic symptoms including FGID. Research has shown significant difference in AS between patients with FGID and healthy subjects (Lackner & Gurtman, 2005).

AS causes individuals to fear the physical symptoms of anxiety and to consider these symptoms as the beginning of a disaster. This concept of worry about worry (meta-worry) is based on metacognitive theories (metacognition) (Wells, 2011). AS and metacognitive beliefs are correlated with each other (Vujanovic, Zvolensky, Bernstein,

Feldner, & McLeish, 2007). Metacognition includes beliefs and strategies that appraise, monitor, or control the cognition. Metacognitive beliefs include positive and negative beliefs regarding worry. Positive beliefs refer to the advantages and benefits of engaging in anxiety (i.e., worry about the future helps me better plan for the future) (Wells, 2011). By activation of negative metacognitive beliefs, worry or rumination itself becomes the focus of negative appraisal, which causes meta-worry (Cook, Salmon, Dunn, & Fisher, 2014). Negative beliefs are related to beliefs about uncontrollability and dangerousness of thoughts and cognitive experiences (Wells, 2011). Negative beliefs about the need to control thinking might typically have a paradoxical effect; attempts to suppress unwanted thoughts or worries lead to increase in their salience and emotional distress (Cook et al., 2014).

The metacognitive variable is considered as the base of many psychological disorders, including generalized anxiety disorder (GAD), social phobia, panic disorder, obsessive-compulsive disorders (OCD), anorexia, and schizophrenia (Morrison et al., 2015; Fisher & Wells, 2005). Nevertheless, dysfunctional metacognitive beliefs can be important in psychosomatic disorders such as FGID in which stress plays a significant role. A recent study showed more dysfunctional metacognitive beliefs among patients with organic and functional gastrointestinal diseases (Quattropani, Lenzo, Mucciardi, & Toffle, 2015).

One of the subjects which has attracted the most attention in recent studies is evaluation of factors associated with anxiety which play a role in psychosomatic diseases as a mediator variable (i.e., AS and dysfunctional metacognitive beliefs) (Cook et al., 2014; Lenzo et al., 2013; Quattropani et al., 2015; Yilmaz, Gencoz, & Wells, 2011). Although extensive researches have been carried out on these variables in some groups of gastrointestinal diseases, no single study has adequately compared AS and dysfunctional metacognitive

beliefs in patients with FGID and healthy controls, simultaneously. If metacognitive beliefs or AS are important in FGID, they require particular psychotherapies. Moreover, psychological prevention methods of FGID have been specified.

AS and metacognitive beliefs have an important role in the development and maintenance of psychosomatic disorders related to anxiety, such as FGID. Thus, the aim of this study was to determine whether there are significant differences in metacognitive beliefs and AS between patients with FGID and healthy individuals in Isfahan, Iran.

Methods

The present case-control study was conducted on 50 patients with FGID who were diagnosed by a gastroenterologist and referred to health centers, private medical offices, and public medical centers in Isfahan from May to July 2015. The subjects were randomly selected. Their healthy matched individuals, who did not have an established diagnosis, were selected based on demographic characteristics from among attendants of patients with FGID. The participants' age ranged from 20 to 65 years and the 50 healthy subjects were in the same age range. After signing informed consent forms, the participants in both groups completed the Anxiety Sensitivity Index-Revised (ASI-R) and the 30-item Metacognition Questionnaire (MCQ-30).

Questionnaires

Anxiety Sensitivity Index-Revised: The initial version of this scale was developed in 1986 (Reiss & McNally, 1985). This questionnaire consists of 16 items rated on a 5-point Likert type scale ranging from 0 to 4 (0: very low-4: very high) and 3 subscales.

The basic subscales of ASI-R include fear of physical symptoms, fear of cognitive symptoms, and fear of publicly observable symptoms (Taylor et al., 2007). The fear of physical symptoms refers to fear of somatic anxiety symptoms, which are believed to lead

to a catastrophic physical issue. The fear of cognitive symptoms refers to the fear of the mental correlates of anxiety symptoms, considered as signals of a mental disorder. The fear of publicly observable symptoms refers to the belief that a public exhibition of anxiety symptoms will result in public ridicule and rejection (Taylor et al., 2007).

In the study by Kavooosi (2014), the internal consistency of the Persian version of ASI was obtained at 0.89. Furthermore, the reliability of the 3 subscales of fear of physical symptoms, fear of cognitive symptoms, and fear of publicly observable symptoms was 0.86, 0.84, and 0.85, respectively.

The 30-item Metacognition Questionnaire:

This measure assesses individual differences in metacognitive beliefs, judgments, and monitoring tendencies. It consists of 5 subscales which are assessed by 30 items. These subscales are labeled positive beliefs about worry (POS), uncontrollability and danger (UD), cognitive confidence (CC), need to control (NC), and cognitive self-consciousness (CSC). POS measures the extent to which a person thinks that perseverative thinking is useful. The UD subscale assesses the negative beliefs about worry concerning uncontrollability and danger, which refers to the extent to which a person believes perseverative thinking to be uncontrollable and dangerous. The CC subscale measures confidence in attention and memory. NC assesses the extent to which a person believes that certain types of thoughts need to be suppressed (e.g., "I should be in control of my thoughts all of the time"). CSC measures the tendency to monitor one's own thoughts and focus attention inward (Wells & Cartwright-Hatton, 2004). In the MCQ-30, each item is scored based on a 4-point Likert scale ranging from 1-4 (do not agree-very much agree). The original MCQ (Wells & Cartwright-Hatton, 2004) and its Persian version (Shirinzadeh Dastgiri, Goudarzi, Rahimi, & Naziri, 2009) possess good internal consistency and convergent validity, as well as acceptable test-retest reliability. The Persian version of the

MCQ-30 (Shirinzadeh Dastgiri et al., 2009) was used in this study.

Ethical Considerations

This study was approved by the Behavioral Sciences Research Center of Isfahan University of Medical Sciences (Grant no: 294270). In addition, before the beginning of the study, informed consent was obtained from all participants, and they were assured of the confidentiality of all their personal information.

Statistical analysis

All analyses were performed in SPSS software (version 18, SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to present the demographic data. Two-sample t-test and chi-square test were, respectively, used for the comparison of continuous variables, and categorical variables.

Results

Table 1 shows the analysis of demographic data in patients with FGID and healthy subjects. The results of t-test in the variable of age and chi-square test in other variables showed that there was no significant difference between demographic variables in the group of

patients with FGID and the control group.

For comparison of the two groups in terms of metacognitive beliefs and AS, multivariate analysis of variance (MANOVA) was used. MANOVA assumptions were made. Regarding equality of covariance matrices, Box's test showed that the observed covariance matrices of the dependent variables were equal across groups ($F = 1.31$, $P = 0.38$). Levene test results showed equality of variances between FGID and control groups in AS and metacognitive beliefs ($F = 0.31$, $P = 0.39$). Wilks' Lambda test results regarding mean differences in the two groups showed a significant difference between FGID and control groups in terms of AS and metacognitive beliefs generally ($F = 2.62$, $P = 0.01$). Table 2 provides the mean scores and standard deviations of the dependent variables (AS and metacognitive beliefs) and comparison of the measures in FGID and control groups. These results have been separately presented in table 2.

Table 2 shows the two groups have significant differences in all subscales of ASI-R and MCQ-30 except the subscales of fear of publicly observable symptoms and UD.

Table 1. Demographic characteristics of the subjects

Variable	Patients with FGID	Control group	P-value
Age [mean (SD)]	35.36 (12.3)	34.51 (11.72)	0.72
Gender [N (%)]			
Male	37 (74.0)	33 (73.3)	0.56
Female	13 (26.7)	12 (26.0)	
Education level [N (%)]			
< High school	29 (59.2)	23 (50.0)	0.61
Bachelor degree	15 (30.6)	16 (34.8)	
> Bachelor degree	5 (10.2)	7 (15.2)	
Marital status [N (%)]			
Single	11 (22.9)	16 (35.6)	0.133
Married	37 (77.1)	29 (64.4)	
Occupation [N (%)]			
Housewife	18 (41.9)	7 (17.9)	
Self-employed	7 (16.3)	8 (20.5)	0.91
Salaried Employee	11 (25.6)	6 (15.4)	
Student	4 (9.3)	2 (5.1)	
Unemployed	3 (7.0)	7 (17.9)	

Table 2. Means, standard deviations, and comparison of anxiety sensitivity and metacognitive beliefs in the functional gastrointestinal disorders and control groups

		Mean \pm SD	Mean square	df	F	P-value
Fear of physical symptoms	FGID	13.02 \pm 8.45	13665.61	1	248.71	0.01
	Control	10.36 \pm 8.59	2570.49	1	172.34	
Fear of cognitive symptoms	FGID	6.74 \pm 4.22	7482.25	1	781.17	0.01
	Control	4.40 \pm 3.45	29790.76	1	152.24	
Fear of publicly observable symptoms	FGID	8.62 \pm 3.08	21550.24	1	115.42	0.48
	Control	8.68 \pm 3.09	26536.41	1	113.65	
POS	FGID	18.56 \pm 4.86	19432.36	1	140.25	0.01
	Control	15.96 \pm 4.91	16002.25	1	114.87	
UD	FGID	14.88 \pm 4.39	13665.61	1	248.71	0.3
	Control	14.48 \pm 4.24	2570.49	1	172.34	
CC	FGID	16.78 \pm 4.63	7482.25	1	781.17	0.01
	Control	13.80 \pm 5.01	29790.76	1	152.24	
NC	FGID	14.40 \pm 3.74	21550.24	1	115.42	0.01
	Control	12.48 \pm 3.71	26536.41	1	113.65	
CSC	FGID	13.06 \pm 3.56	19432.36	1	140.25	0.01
	Control	12.24 \pm 3.89	16002.25	1	114.87	

POS: Positive beliefs about worry; UD: Uncontrollability and danger; CC: Cognitive confidence; NC: Need to control; CSC: Cognitive self-consciousness; FGID: Functional gastrointestinal disorders; SD: Standard deviation; df: Degrees of freedom

Discussion

AS and dysfunctional metacognitive beliefs play a significant role in FGID. Despite the role of these constructs in psychopathology, no studies have compared them between patients with FGID and healthy individuals. This study indicated significant differences between FGID and control groups in subscales of MCQ-30 (i.e., POS, CC, NC, and CSC); FGID patients obtained higher scores in these subscales compared with the healthy controls.

These results are consistent with the findings of Quattropani et al., (2015) which showed significant correlations between diagnosis of gastrointestinal disorder (functional and organic) and metacognitive dysfunctional beliefs. Other studies showed a relationship between POS and anxiety in psychosomatic disorders such as cancer (Cook et al., 2014; Quattropani et al., 2015). Patients' belief that preservative thinking is useful can increase anxiety symptoms and AS. On the other hand, NC was negatively related to anxiety. It may be due to this that participants, with higher conviction about the need to control their thinking, experience greater anxiety. This finding is in agreement with the findings of a study that showed that cancer patients have higher scores in the NC

subscale of MCQ-30 which predicts higher anxiety in them (Cook et al., 2014).

In the present study, there were significant differences between FGID and control groups in the subscales of fear of physical symptoms and fear of cognitive symptoms of ASI-R. AS in gastrointestinal diseases has been described as gastrointestinal (GI) symptom-specific anxiety (GSA). GSA has 5 dimensions, which include worry, fear, vigilance, sensitivity, and avoidance (Saigo et al., 2014).

Hypervigilance is defined as an increased awareness and attention and might increase perceived relevance of GI-specific sensations leading to a decreased ability to notice other internal or external stimuli. Sensitivity, as heightened perception, might raise GI-specific sensations and symptoms under a variety of conditions including eating and stress (Labus et al., 2004). Hypervigilance and sensitivity as two dimensions of GSA are synonymous with the fear of physical symptoms subscale of ASI-R.

Dysfunctional metacognitive beliefs are correlated with AS in patients with gastrointestinal disorders (or GSA). For example, worry, vigilance, and sensitivity dimensions are related to the POS subscale of

MCQ-30. Moreover, avoidance (especially seeking reassurance) and vigilance dimensions are related to CSC and CC subscales of MCQ-30. The tendency to monitor one's own thoughts and focus attention inwards has a marginal role in the metacognitive model of psychopathology. This finding was consistently with previous studies on metacognition.

Individuals with high AS search the environment for any symptom of a potential disaster and react to any internal or external stimulant with hypervigilance and high sensitivity (Dowden & Allen, 1997).

Therefore, individuals with emotion vulnerabilities such as AS catastrophize and react to even normal events with enhanced anxiety (Kashdan, Zvolensky, & McLeish, 2008). Individuals with higher AS frequently have concerns about bodily anxiety symptoms and react to them negatively. Negative evaluation and catastrophizing of a bodily sense can lead to exacerbation of anxiety which, in turn, enhances anxiety symptoms (Schmidt et al., 2010).

In the current study, there were significant differences between FGID and control groups in the POS, CC, NC, and CSC subscales of MCQ-30; the FGID group had higher scores in these subscales. These results are consistent with the findings of a study that showed there were significant correlations between the diagnosis of gastrointestinal disorders (functional and organic) and metacognitive dysfunctional beliefs (Quattropani, Lenzo, Fries, & Belvedere, 2014). Other studies showed a relationship between POS and anxiety in psychosomatic disorders such as cancer (Quattropani et al., 2015, Cook et al., 2014). A patient's belief that preservative thinking is useful can increase anxiety symptoms and AS. On the other hand, NC was negatively related to anxiety. This suggests that participants with higher conviction about the need to control their thinking experience greater anxiety. This finding is consistent with the findings of Cook et al. (2014) who showed that cancer

patients have higher scores in the NC subscale of MCQ-30 and this predicts higher anxiety in them.

The present study showed that patients with FGID and healthy individuals did not have significant differences in the UD subscale. This finding was not consistent with previous studies on students and the public, which have indicated that greater negative beliefs about worry (such as UD) predict higher levels of anxiety (Wells, & Cartwright-Hatton, 2004; Spada, Mohiyeddini, & Wells, 2008; Yilmaz, Gencoz, & Wells, 2011; Allott, Wells, Morrison, Walker, 2005). This result may indicate a difference in negative beliefs about worry between FGID patients and the general population. However, further research is required to establish whether this is a true population difference or an artifact of the present data.

In summary, the current study provides initial evidence that patients with FGID have more dysfunctional metacognitive beliefs and AS compare to healthy populations.

Conclusion

Due to the importance of AS and dysfunctional beliefs as components in FGID, their roles in this respect and that of other psychological factors should be studied. A deeper understanding of these components is necessary for the development of better preventive and therapeutic methods. However, with a small sample size of heterogeneous patients with FGID, caution must be applied, as the findings might not be transferable to all patients with FGID. Hence, further researches with greater sample size are recommended in specific FGIDs.

Conflict of Interests

Authors have no conflict of interests.

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