

Trigger survey approach to the evaluation of anxiety in patients with irritable bowel syndrome

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Irritable bowel syndrome (IBS) is one of the most common psychosomatic conditions affecting near 10 % of general population. Despite its relevance for today, there is no a unified approach to understanding its pathogenesis, it could be recognized as a complex somatoform reaction (based on the argument of extremely high comorbidity with anxiety and depressive conditions) or as a functional disorder (based on stereotypical clinical manifestations). The understanding of IBS as a psychosomatic condition as one that has combined psychopathogenesis seems to have the greatest perspectives in a clinical way. The study on psychological and behavioral components of IBS presents a promising area to understand ways of providing high-quality medical care for IBS patients.

Aim. To systematize and evaluate the triggers of anxiety in patients with mixed form of irritable bowel syndrome.

Materials and methods. A prospective study was conducted over a period of 2022–2023 including 100 patients with the main diagnosis of IBS. A distribution of IBS forms was as follows: 67 individuals with IBS-D (ICD-10: K58.1), 12 individuals with IBS-C (ICD-10: K58.2), 21 individuals with IBS-M (ICD-10: K58.3). They all were enrolled in the study as voluntary participants in a closed-ended online survey for IBS community support group. A mean age of IBS group was 38.5 ± 6.1 years. The comparison group was presented by 100 healthy volunteers without diagnosed pathology of gastrointestinal (GI) tract (or any GI-associated complains). A mean age of healthy volunteers was 29.5 ± 4.2 years. The study relied on the following methods: anamnestic, psychodiagnostic and statistical.

Results. To structurally evaluate triggers of anxiety in patients with IBS we managed to distribute 23 separate triggers in 3 categories (social activity violations, eating habits and diet restrictions, health concerns). Each category was associated with features of a specific mental disorder: social activity violations – social anxiety disorder; eating habits and diet restrictions – avoidant and restrictive food intake disorder; health concerns – hypochondriasis. Anxiety level rating was collected according to the Likert scale in 5 ranks: "0" no anxiety (calm state); "1" – mild anxiety (slightly nervous); "2" – moderate anxiety (nervous); "3" – severe but controlled anxiety (very nervous or experiencing fear); "4" – uncontrolled anxiety (panicking). A distribution of anxiety levels for each trigger was determined and compared between healthy and IBS individuals.

Conclusions. The analysis of the trigger set for social activity violations has shown a dominance of the formal setting and complexity of social situations in increasing the level of anxiety. The analysis of the trigger set related to eating habits and diet restrictions has shown that the formal setting, complicated social activity, and diet violations also tended to induce more intensive anxiety. The analysis of the health concern trigger set has revealed that sensations in the abdomen caused the most intensive cases of anxiety along with concerns about possible misdiagnosis of IBS.

Ключові слова:
тригер, тривога,
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Підхід до оцінювання тригерів тривоги шляхом опитування пацієнтів із синдромом подразненого кишечника

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Синдром подразненого кишечника (СПК) – один із найпоширеніших соматоформних станів. Незважаючи на актуальність питання, досі немає єдиного розуміння патогенезу СПК: цей розлад можна визначати як складну соматоформну патологію (зважаючи на надзвичайно високу коморбідність із тривожно-депресивними станами) або як функціональний стан (на підставі стереотипних клінічних проявів). Розуміння СПК як психосоматичного стану, що має комбінований (психо-)патогенез, є перспективним у клінічному аспекті та потребує вивчення психічних і поведінкових компонентів.

Мета роботи – систематизувати й оцінити тригери тривоги в пацієнтів із синдромом подразненого кишечника.

Матеріали та методи. Проспективне дослідження здійснили у 2022–2023 рр. на контингенті 100 пацієнтів з основним діагнозом СПК. Структура контингенту за формою СПК: 67 осіб із СПК-Д (МКХ-10: K58.1), 12 хворих на СПК-К (МКХ-10: K58.2), 21 випадок СПК-З (МКХ-10: K58.3). Обстежені залучені в дослідження як волонтери в закритому онлайн-опитуванні спільноти підтримки СПК. Середній вік групи хворих на СПК становив $38,5 \pm 6,1$ року. У групу порівняння залучили 100 здорових добровольців без діагностованої патології шлунково-кишкового тракту (або будь-яких скарг щодо шлунково-кишкового тракту). Середній вік здорових добровольців становив $29,5 \pm 4,2$ року. Методи дослідження: анамнестичний, психодіагностичний і статистичний.

Результати. Визначили 23 окремі тригери у 3 категоріях (порушення соціальної активності, харчові звички й обмеження дієти, занепокоєння здоров'ям). Кожна категорія асоційована з ознаками певного психічного розладу: порушення соціальної активності – соціальний тривожний розлад; харчові звички й обмеження дієти – розлад уникнення / обмеження споживання їжі; переживання, пов'язані зі здоров'ям, – іпохондрія. Рівень тривожності оцінювали за шкалою Лайкєр-та, що передбачала 5 ґрадацій: «0» – немає тривожності (спокійний стан); «1» – легка тривожність (злегка нервує); «2» – помірна тривожність (нервує); «3» – сильна, але контрольована тривога (дуже нервує або відчуває страх); «4» –

неконтрольована тривога (паніка). Визначили розподіл рівнів тривоги для кожного тригера, порівняли показники хворих на СПК і здорових осіб.

Висновки. Аналіз набору тригерів категорії порушень соціальної активності показав домінування чинників формальної обстановки та складності соціальних ситуацій щодо підвищення рівня тривожності. Аналіз набору тригерів категорії харчових звичок і дієтичних обмежень, показав: формальна обстановка, складна соціальна активність і порушення дієти також спричиняли більш інтенсивну тривожність. Аналіз набору тригерів категорії занепокоєння здоров'ям показав, що відчуття в животі зумовлюють найінтенсивніші випадки тривоги разом із занепокоєнням щодо можливого неправильного діагнозу СПК.

The psychosomatic pathology regardless to a traditional psychological approach is currently seen in the context of specialized medical specialties. Meanwhile, the prevalence of these disorders is high, despite all the justified measures for their prevention. Therapy for these disorders often does not reach efficacy, that must be due to a merely somatic understanding of their origin and mechanisms of development. One of the most promising directions for solving this paradox is the concept of psychological distress caused by physical symptoms, social consequences, and self-esteem violations in psychosomatic conditions [1,3,4,7,9].

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The understanding of IBS as a psychosomatic condition as one that has combined psychopathogenesis seems to have the greatest perspectives in a clinical way. The study on psychological and behavioral components of IBS presents a promising area to understand ways of providing high-quality medical care for IBS patients [1,2,4,5,6].

Aim

To systematize and evaluate the triggers of anxiety in patients with mixed form of IBS.

Materials and methods

A prospective study was conducted over a period of 2022–2023 including 100 patients with the main diagnosis of IBS. A distribution of IBS forms was as follows: 67 individuals with IBS-D (ICD-10: K58.1), 12 individuals with IBS-C (ICD-10: K58.2), 21 individuals with IBS-M (ICD-10: K58.3). They all were enrolled in the study as voluntary participants in a closed-ended online survey for IBS community support group. A mean age of IBS group was 38.5 ± 6.1 years. The comparison group was presented by 100 healthy volunteers without diagnosed pathology of gastrointestinal (GI) tract (or any GI-associated complaints). A mean age of healthy volunteers was 29.5 ± 4.2 years.

The study relied on the following methods:

- anamnesic, was used during the main stage of the study to define the medical status of the contingent and a range of anxiety triggers. The method was implemented through online-interviews;

- psychodiagnostic, was used to determine the distribution of anxiety levels based on its triggers by structured psychodiagnostic interviews applied to the study contingent. Anxiety triggers were transformed to the structured

psychodiagnostic interviews and evaluated with the Likert scale. The method was implemented via the closed-ended online survey;

- statistical, was presented by the Pearson's χ^2 test. All calculations were performed on a personal computer using the Statistica 13.0 program (StatSoft, USA).

Results

To structurally evaluate triggers of anxiety in patients with IBS we managed to distribute 23 separate triggers in 3 categories (social activity violations, eating habits and diet restrictions, health concerns). Each category was associated with features of a specific mental disorder: social activity violations – social anxiety disorder; eating habits and diet restrictions – avoidant and restrictive food intake disorder; health concerns – hypochondriasis.

Anxiety level rating was collected according to the Likert scale in 5 ranks: "0" no anxiety (calm state); "1" – mild anxiety (slightly nervous); "2" – moderate anxiety (nervous); "3" – severe but controlled anxiety (very nervous or experiencing fear); "4" – uncontrolled anxiety (panicking).

Despite the fact, that mean values did not match the exact and reliable data on anxiety levels due to its pseudo-quantitative character, it could be useful for clinical understanding the differences between contingents (without accurate statistical analysis).

The categories of anxiety triggers were:

1. Social activity violations associated with agoraphobia: the set of triggers influencing psychological distress caused by a forced avoidance of social activities due to manifestations of IBS. The set included recreational activities, personal relations, study and labor activity, volunteering, etc. Distress distribution in the trigger set is presented in *Tables 1* and *2*.

The anxiety levels in healthy volunteers and IBS patients were compared in various social situations. In the healthy group, most volunteers reported low anxiety levels in most trigger situations with slight observed variations. However, in IBS group, higher mean anxiety levels were steadily reported in almost all trigger situations.

While walking outdoors, healthy volunteers reported a mean anxiety level of 0.12. In contrast, volunteers with IBS reported a mean anxiety level of 1.21. Walking in public places was associated with a mean anxiety level of 0.25 in healthy volunteers. However, volunteers with IBS reported a significantly higher mean anxiety level of 1.69. When visiting recreational events, healthy volunteers reported a mean anxiety level of 0.36 compared to that of 2.30 in volunteers with IBS. Healthy volunteers reported a mean anxiety level of 0.07 when visiting stores, that was minimal, and those with IBS reported a level of 1.63. A mean anxiety level associated with long-distance traveling was of 0.56 in healthy volunteers, but it was significantly higher, 2.93, in

Table 1. Healthy group: a distribution of anxiety levels in the trigger set of social activity violations

Triggers	The Likert scale anxiety level (n, %)					
	0	1	2	3	4	Mean (M)
Walking outdoors	96	0	4	0	0	0.12
Walking in public places	81	15	2	2	0	0.25
Visiting recreational events	79	9	9	3	0	0.36
Visiting stores	96	2	1	1	0	0.07
Long-distance traveling (more than 1 day)	66	19	9	5	1	0.56
Meeting friends or dating in public places	85	7	8	0	0	0.23
Visiting friend's apartment	90	8	2	0	0	0.22
Visiting appointments	57	22	17	4	0	0.68
Visiting healthcare facilities	10	35	39	10	6	1.68

Table 2. IBS group: a distribution of anxiety levels in the trigger set of social activity violations

Triggers	The Likert scale anxiety level (n, % = 100)					
	0	1	2	3	4	Mean (M)
Walking outdoors	28**	27**	41**	4	0	1.21
Walking in public places	13**	22	48**	17**	0	1.69
Visiting recreational events	4**	20*	27**	40**	9	2.30
Visiting stores	13**	28**	42**	17**	0	1.63
Long-distance traveling (more than 1 day)	5**	9*	19*	22**	45**	2.93
Meeting friends or dating in public places	12**	8	30**	31**	19**	2.37
Visiting a friend's apartment	15**	22**	31**	18**	13**	1.94
Visiting appointments	12**	23	34**	26**	5*	1.89
Visiting healthcare facilities	13	32	24*	24**	7	1.82

Significant differences (Pearson's χ^2 test): * – $p \leq 0.05$; ** – $p \leq 0.01$

Table 3. Healthy group: a distribution of anxiety levels in the trigger set of eating and diet restrictions

Triggers	The Likert scale anxiety level (n, % = 100)					
	0	1	2	3	4	Mean (M)
Eliminating desired food from a diet	74	22	4	0	0	0.30
Impulsive diet violations	77	14	7	2	0	0.34
Urges to the toilet right after a meal	94	2	4	0	0	0.14
Eating in social environment	96	1	2	1	0	0.08
Eating in public places	85	8	6	1	0	0.23
Breakfast before leaving home to work	91	7	2	0	0	0.11
Eating at a workplace	88	7	5	0	0	0.17

Table 4. IBS group: a distribution of anxiety levels in the trigger set of eating and diet restrictions

Triggers	The Likert scale anxiety level (n, % = 100)					
	0	1	2	3	4	Mean (M)
Eliminating desired food from a diet	26**	32	17**	12**	13**	1.54
Impulsive diet violations	19**	18	27**	23**	13**	1.93
Urges to the toilet right after a meal	8**	12**	33**	19**	28**	2.47
Eating in social environment	8**	13**	25**	28**	26**	2.51
Eating in public places	15**	10	24**	24**	27**	2.38
Breakfast before leaving home to work	21**	17*	21**	13**	28**	2.09
Eating at a workplace	17**	23**	21**	24**	15**	1.97

Significant differences (Pearson's χ^2 test): * – $p \leq 0.05$; ** – $p \leq 0.01$

volunteers with IBS. While meeting friends or dating in public places, healthy volunteers experienced a mean anxiety level of 0.23 and those with IBS reported a higher mean anxiety level of 2.37. A mean anxiety level when visiting a friend's apartment in healthy volunteers was of 0.22, indicating a

minimal anxiety, versus 1.94 in IBS volunteers, showing a moderate level of anxiety. Visiting appointments induced a mean anxiety level of 0.68 in healthy volunteers and 1.89 in those with IBS. Healthy and IBS volunteers reported a mean anxiety level of 1.68 and 1.82, respectively, when visiting healthcare facilities.

2. Eating and diet restrictions associated with eating behavior disorders: the set of triggers representing psychological distress caused by relations between eating habits and specific diets and consequences of gastronomic violations included anxiety about eating, diet restrictions, impulsive eating, social eating, eating in public places, etc. Distress distribution in the trigger set is presented in Tables 3 and 4.

An analysis of anxiety levels induced by eating and diet restrictions has shown that anxiety from moderate to uncontrolled was largely provoked by eating in formal environment. Strict dietary restrictions were found to trigger less anxiety than the consequences of impulsive eating. Volunteers of healthy group mostly reported low anxiety levels in most trigger situations with slight variations. However, in IBS group, higher mean anxiety levels were steadily reported.

A mean anxiety level of 0.30 was reported by healthy volunteers due to elimination of desired food from a diet, and IBS volunteers reported the mean anxiety level of 1.54. Impulsive diet violations provoked a mean anxiety level of 0.34 in healthy volunteers versus a significantly higher level of 1.93 in those with IBS. Mean anxiety levels associated with urges to the toilet right after a meal were of 0.14 and 2.47 in healthy and IBS volunteers, respectively. Eating in social environment caused a mean anxiety level of 0.08 in healthy volunteers, that was minimal, while volunteers with IBS reported a mean anxiety level of 2.51. Healthy volunteers reported a mean anxiety level of 0.23 when eating in public places, and volunteers with IBS indicated a significantly higher mean anxiety level of 2.38. Breakfast before leaving home to work aroused mean anxiety levels of 0.11 and 2.09 in healthy and IBS volunteers, respectively. Mean anxiety levels of 0.17 and 1.97 were induced by eating at a workplace in healthy volunteers, indicating a minimal anxiety, and in those with IBS, respectively.

3. Health concerns associated with hypochondriasis: the set of triggers representing psychological distress caused by concerns about current health condition and somatic and mental health perspectives, included hypochondriac anxiety, change in bowel habits, abdominal discomfort, etc. Distress distribution in the trigger set is presented in Tables 5 and 6.

An analysis of anxiety levels induced by health concerns has shown the prevalence of specific concerns on abdominal distress over non-specific ones. Unusual feelings in the abdomen, abdominal pain and episodes of obstipation were the dominant sources of anxiety in this trigger set. The majority of healthy volunteers reported low anxiety levels in most trigger situations with slight variations. Though in IBS group, higher mean anxiety levels were steadily reported in trigger situations.

Healthy volunteers and those with IBS reported mean anxiety levels of 0.57 and 1.55, respectively, associated with concerns about weight loss. Concerns about fatigue triggered mean anxiety levels of 0.38 and 2.08 in healthy and IBS volunteers, respectively. Concerns about stool

consistency and color induced mean anxiety levels of 0.19 and 2.11 in healthy volunteers and those with IBS. Healthy volunteers reported a mean anxiety level of 0.47 due to concerns about abdominal pain, that was minimal, while IBS volunteers reported a level of 2.77. Mean anxiety levels associated with concerns about intestinal obstruction were 0.24 and 1.77 in healthy volunteers and those with IBS, respectively. Concerns about unusual abdominal feelings caused mean anxiety levels of 0.15 and 2.72 in healthy and IBS volunteers, respectively. Mean anxiety levels due to concerns about a possibility of misdiagnosis were of 0.17 and 2.18 in healthy volunteers and those with IBS, respectively.

Discussion

IBS is gastrointestinal pathology with a complicated neurotic structure [6,8]. Although it is well known that IBS have strong comorbid relations with anxiety and depressive disorders, there is a lack of studies that focused on a specific anxiety that seriously affects the GI functioning and general quality of life [3,4].

The collected and analyzed data are consistent with studies in clinical psychology on the role of anxiety in manifestations and course of IBS [5,6], however we managed to use a relatively wide set of triggers to get just a general perspective on directions of the impact rather than conduct a thorough analysis.

Study limitations were presented by a lack of clinical data and medical histories of patients, that follows from methodology used to form the contingent. However, the study aimed at the systematization and evaluation of anxiety triggers, but not at detecting any clinical relations.

Other limitation was an absence of standardized and valid diagnostic tools for evaluating anxiety triggers in IBS, thus we used non-standardized set of questions that could not be reliably quantified and compared with other studies on specific anxiety patterns in IBS. In following studies, we are planning to solve this problem by developing a questionnaire with sufficient statistical significance.

Conclusions

1. In total, 23 triggers of anxiety in patients with IBS were systematized in 3 sets: social activity violations (9 triggers), eating and diet restrictions (7 triggers), health concerns (7 triggers). By structured online survey, the distribution of anxiety levels (from 0 to 4 according to the five-point Likert scale) provoked by each trigger was identified and compared between two groups of 100 individuals each, healthy and diagnosed with IBS.

2. In the healthy group, most volunteers reported low anxiety levels with slight variations in most trigger situations with the one exception of the moderate anxiety level due to visiting healthcare facilities. However, in IBS group, higher mean anxiety levels were steadily reported in all trigger situations.

3. The analysis of social activity trigger set has shown that IBS individuals presented the highest anxiety levels due to visiting recreational events, long-distance traveling and meeting friends or dating in public places, however other social activities also provoked higher anxiety levels than in healthy individuals. Eating and diet restrictions trigger set

Table 5. Healthy group: a distribution of anxiety levels in the trigger set of health concerns

Triggers	The Likert scale anxiety level (n, % = 100)					Mean (M)
	0	1	2	3	4	
Concerns about weight loss	64	17	17	2	0	0.57
Concerns about fatigue	78	9	10	3	0	0.38
Concerns about stool consistency and color	91	0	8	1	0	0.19
Concerns about abdominal pain	67	24	4	5	0	0.47
Concerns about intestinal obstruction	81	14	5	0	0	0.24
Concerns about unusual abdominal feelings	87	11	2	0	0	0.15
Concerns about a possibility of misdiagnosis	90	4	5	1	0	0.17

Table 6. IBS group: a distribution of anxiety levels in the trigger set of health concerns

Triggers	The Likert scale anxiety level (n, % = 100)					Mean (M)
	0	1	2	3	4	
Concerns about weight loss	37**	17	17	12**	17**	1.55
Concerns about fatigue	15**	20*	24**	24**	17**	2.08
Concerns about stool consistency and color	8**	29**	22**	26**	15**	2.11
Concerns about abdominal pain	8**	6**	26**	21**	39**	2.77
Concerns about intestinal obstruction	28**	17	25**	10**	20**	1.77
Concerns about unusual abdominal feelings	8**	4	25**	34**	29**	2.72
Concerns about a possibility of misdiagnosis	17**	23**	6	33**	21**	2.18

Significant differences (Pearson's χ^2 test): * – $p \leq 0.05$; ** – $p \leq 0.01$

has revealed the highest anxiety levels in IBS individuals due to urges to the toilet right after a meal, eating in social environment, eating in public places, and breakfast before leaving home to work. Other triggers also have shown considerably higher potential to cause anxiety in comparison with healthy individuals. Health concerns trigger set analysis has shown that concerns about fatigue, stool consistency and color, abdominal pain, unusual abdominal feelings, possibility of misdiagnosis, which were major triggers in the category, caused massive anxiety in IBS individuals, also higher than that in healthy individuals.

4. Data obtained seems to be not absolutely accurate due to obvious limitations of the study (online format, incomplete analysis of medical histories, absence of powerful statistical tools, small study population), but gives an insight to psychological and behavioral components of IBS that could be potentially useful for the development of diagnostic tools aimed at IBS psychological distress and mental comorbidity.

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