

Own body experience and parents' attitudes perceived retrospectively in patients with irritable bowel syndrome

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Summary

Aim. The objective of the study was to seek connections between mental body representations (body image, body schema and body sense) and parents' attitudes perceived retrospectively in patients with irritable bowel syndrome.

Method. 184 adults aged 18 to 64 participated in the study, including patients with irritable bowel syndrome (IBS; $N = 63$), patients with inflammatory bowel diseases (IBD; $N = 60$) and healthy respondents ($N = 61$). Respondents took the Battery of Tests of the Body Self Representations (B. Mirucka) and the *Childhood Questionnaire* (J. Hardt, U.T. Egle and A. Engfer).

Results. (1) IBS patients are characterized by lower representations of the body schema, body image and body sense compared to healthy people as well as lower organized body schema and body sense compared to IBD patients. (2) IBS patients in a similar way to IBS patients and healthy people describe the attitude of their mothers during childhood. In comparison to healthy people, IBS patients experience their fathers as significantly less loving. (3) In the group of IBS patients, there are significant relationships between the body sense and the retrospectively perceived attitude of love and control from both mothers and fathers.

Conclusions. IBS patients are characterized by lower organization of mental body representation than healthy people and IBD patients. In the psychosocial functioning of IBS patients, the representation of body sense is particularly important. The peculiarity of the IBS patients' childhood relationship with their parents seems to be significant and requires further research.

Key words: irritable bowel syndrome, body image, parental attitudes

Introduction

Irritable bowel syndrome

Irritable bowel syndrome (IBS) is a functional disorder where the main symptoms are recurring stomach aches – on average once a week for the past 3 months – and changes in the pattern of bowel movements – diarrheas and/or constipation [1]. Research indicates an incidence of IBS in European countries at the level of 11.5%; it occurs significantly more frequently in women [2, 3]. Etiology of the disorder is complex; some of the indicated causes feature: genetic factors, gastrointestinal tract motility disorders, visceral hypersensitivity, bacterial infections or dysregulation of the gut-brain axis [4–7]. According to the latest findings (Rome IV Criteria), IBS is defined as a functional disorder of the gut-brain interaction [1], which indicates researchers' consensus as regards its psychosomatic nature.

Mental factors are not among the formal IBS diagnostic criteria but are related to the symptom intensification, history of the disorder development, decision to seek medical help; they also affect the course of the treatment process, in particular in patients reporting more severe symptoms [1, 8–10]. There is a link between the IBS symptoms and the anxiety disorder symptoms (panic disorder, generalized anxiety disorder), mood disorders (depression, dysthymia) as well as somatoform disorders [2, 8, 10–13]. Moreover, the following traumatic events were found to be significantly more frequent in the life stories of people diagnosed with IBS than in the group of healthy people: sexual abuse, physical and mental violence; death or illness of a parent; mental illness in the family [8, 14, 15]. People with a diagnosis of functional gastrointestinal system disorders significantly more frequently experience physical violence and sexual abuse as compared with organic intestinal disorder sufferers [16]. Furthermore, patients suffering from medium and severe functional symptoms significantly more frequently show an anxious-avoidant attachment style in comparison to a control group of healthy people [17], which indicates that also the quality of daily interactions with carers in the childhood is of importance in the case of people with an IBS diagnosis.

IBS patients focus on their bodies in a particular manner. In comparison with healthy people they experience higher somatic anxiety [18], and in particular gastrointestinal-specific anxiety. Such anxiety occurs in relation to visceral symptoms and sensations as well as the context of their occurrence. It is related to an intensification of somatic symptoms, higher level of stress and reduced quality of life [19, 20]. Patients are characterized with a stronger tendency to experience somatic sensations as more intense, potentially harmful and unsettling than healthy people (so-called somatosensory amplification) [12]. Individual study results show that patients with this diagnosis present a less positive body image than healthy people and patients with an organic intestinal disease diagnosis [9, 12].

Mental body representations

The literature on mental aspects of own body experiencing features a wide terminology variation, including those within mental body representations [21]. Among them two notions are predominant: 'body schema' and 'body image'. Body schema is an automatic sensorimotor system constantly regulating the posture and movements without a need of conscious monitoring [22]. Body image is a complex process of experiencing oneself in a bodily manner, which exists on the border of internal life of an individual and the external world – relationships with others [21]. Functional symptoms on the part of the gastrointestinal tract do not have a very explicit impact on body appearance or on mobility. IBS is associated with a particular, distinct from the one of healthy persons, manner of perceiving somatic sensations and a personal attitude towards them. Therefore, neither the body schema nor body image concept is directly related to such type of experiences derived from the sense of interoception. Hence a separate construct allowing to capture such phenomena is helpful. Apart from the body schema and body image, the model of an embodied subject by Mirucka [23] distinguishes a body sense as a complex mental representation referring to creating images of states, processes or body functioning and covers comprehensive experiencing the physical condition [23]. Interoception, as the main source of information for this representation, constitutes a communication axis between the body and the brain, referring to the body and internal organs condition, covers signals from the heart, lungs, stomach, intestines or bladder, it registers the heartbeat pace, sensation of hunger, nausea, intestinal cramps and facilitates homeostatic regulation of the body as a whole [24]. An analysis of literature provides an assumption that there is no research in which mental body representation in IBS would constitute the focal notion.

The success of the embodiment process, which involves a transition from simple, unconscious experiencing one's body as a whole to a complex, conscious experience of self in a bodily manner [23] is primarily dependent on interpersonal factors starting with the quality of early childhood relationship with a carer [21, 23, 25]. The authors interested in the aspects of corporeality are unanimous as regards the significance of sufficiently good care in the development of mental representations of the body [21, 23, 25–27]. In the light of data on a greater number of interpersonal abuses among people with IBS in comparison with healthy people [8, 14–16], the question about the relationship between these difficult experiences and mental body representations becomes important. Hence, it is likely that the respondents, who experience their bodies in a disturbed manner, shall also present more negative representations of their carers from the childhood period. Thus, it was decided that a study of the relation between mental body representations and retrospectively perceived attitudes of a mother and father in IBS patients is worth exploring.

Due to the similarity of symptoms, yet distinct etiological differences, it was considered justifiable to compare the functioning of IBS patients to the inflammatory bowel disease (IBD) patients: Crohn's disease and ulcerative colitis. It was assumed that an analysis of differences between the patients reporting gastrointestinal tract functional *versus* organic symptoms shall expand understanding of the IBS character.

Due to the inclusion of a group of IBD patients, experiencing somatic symptoms shall be the control variable and therefore it shall be possible to analyze the meaning of psychosocial variables separately.

According to the above-mentioned objectives, the following research questions were formulated:

- (1) Are there significant differences between IBS patients and IBD patients and healthy people as regards the representation of body schema, body image and body sense?
- (2) Are IBS patients significantly different from IBD patients and healthy people as regards parents' attitudes in the childhood perceived retrospectively?
- (3) What are associations between mental representations of the bodily Self and retrospectively perceived attitudes of mothers and fathers from the IBS patients' childhood?

Method

The study involved 184 adult people aged 18–64 ($M = 35.83$). Three respondent groups were selected. Group A ($N = 63$) were respondents with IBS diagnosed by a gastroenterologist. Group B ($N = 60$) covered respondents with an IBD diagnosis. Group C ($N = 61$) covered only healthy respondents who did not report any presence of a chronic disease or frequency of experiencing stomach ache more than once a week. A difference (tested using Kruskal-Wallis H test) among three respondent groups as regards the age showed to be insignificant ($p > 0.05$). A majority of respondents (72.8%) were women ($N = 134$): in group A – 79.4%, in group B – 65%, and in group C – 73.8%.

The study of respondents suffering from IBS (A) and IBD (B) was conducted individually on hospital premises in cooperation with doctors and nurses. The majority of patients ($N = 119$) were recruited from clinics and hospital wards, specialist clinics (gastroenterological and intestinal diseases), four patients – from private psychotherapy centers. The admission criterion in the group of subjects was the diagnosis made by a gastroenterology specialist. All patients were under the active treatment of a specialized doctor. The control group (C) included respondents selected in relevance to their sex and age in relation to group A. They were recruited from various sectors of national institutions and private enterprises. Respondents have not been remunerated for participation in the study.

Respondents completed the Battery of Tests of the Body Self Representations (B. Mirucka) [23, 28] and the *Childhood Questionnaire* (J. Hardt, U.T. Egle, A. Engfer) [29, 30].

The Battery of Tests of the Body Self Representations (The Battery of Tests BSR, B. Mirucka) constitutes an empirical verification of a theoretical model of an embodied subject [23, 28]. It consists of three parts which are an operationalization of mental body representations: body schema, body image and body sense. All the scales are unidimensional with separate versions for women and men. The scale of the body schema and the scale of the body image consist of 6 items each. The body sense scale consists of 3 parts: the scale of bodily sensations, the scale of body-related emotions

and the scale of physical needs. In total it consists of 15 statements. All test items are in the form of an affirmative sentences with a need to express an attitude towards it with the application of a 7-point scale from "I fully disagree" to "I fully agree". The higher the factor on a particular scale, the more the individual mental representation is conducive to a correct, *i.e.*, subjective, experiencing one's own body [28].

The scale of body schema is used to study the level of one's own bodily integrity. High results indicate experiencing own body as a complex of a variety of parts which are an indivisible whole. They also testify to the sense of directing one's body efficiently, coordinating one's movements and actions. Whereas low results prove difficulties in experiencing oneself as a psychophysical unity, insufficient motor coordination as well as insufficient sense of ownership of one's body and capability to control it. The body image scale is intended for a perceptive analysis of own body appearance. High results suggest acceptance of one's external appearance. Low results are evident of dissatisfaction with own body appearance. The body sense scale refers to body sensations, body-related emotions and bodily needs. The bodily sensations subscale allows to establish the level of awareness of stimuli from various areas of the body: external (e.g., skin) and internal (e.g., internal organs). Obtaining high results proves the advantage of positive body sensations over physical discomfort, as well as a developed ability to recognize and interpret body experiences. Low results suggest a reduced awareness of signals from the body, which is associated with a feeling of discomfort and narrowing the spectrum of experiences to unpleasant bodily sensations (e.g., pain). The body-related emotions subscale is used to examine emotional experiences related to body sensations. High results indicate experiencing own corporeality in a positive way and a developed ability to deal with strong emotions. Low results suggest experiencing one's body as a source of negative emotions and helplessness in the presence of strong emotional arousal. Within the physical needs subscale high results are evident of undertaking actions aimed at caring and protecting one's own body. Low results imply neglecting or inadequate meeting of bodily needs, which may be manifested in self-neglect in terms of appearance, nutrition, as well as rest and relaxation.

Psychometric properties (construct, criterion, diagnostic validity and reliability) of the tests were assessed as sufficient based on the results of several studies [23, 28]. In this study, reliability, measured with the Cronbach's alpha statistics, is satisfactory for all three major scales and is respectively: for the scale of body schema $\alpha_s = 0.73$, body image $\alpha_o = 0.86$ and body sense $\alpha_p = 0.84$. For the entire scale reliability was very high $\alpha = 0.91$.

The Childhood Questionnaire (German *Kindheitsfragebogen* – KFB) was translated into Polish by Monika Misiec and Katarzyna Schier. The tool is directed to adults and includes 128 questions on family experiences from the period of childhood (until the age of 14) divided into two parts. The first part includes questions related to the family members, relations between them, experienced violence, social support received from people outside the family, and socioeconomic status of the family. This study used the second part, *i.e.*, questionnaire on a retrospective attitude of a mother and retrospective attitude of a father. The tool includes 4 subscales (5 items each) defining

the features of a relationship with a parent: *Love*, *Ambition*, *Role reversal* and *Control* (item examples: love scale – “My mother was very understanding of me”, ambition scale – “My father was very demanding towards me”, role reversal scale – “With marital problems I was supposed to take my mother’s side always” and control scale – “My father believed that penalties must break child’s stubbornness”). A respondent marks their answers on a 4-point scale from “completely irrelevant” to “very relevant”. The tool was evidently reliable for this study – Cronbach’s alpha statistics for individual scales oscillated between 0.77 (*Role reversal* scale – mother’s attitude) and 0.94 (*Love* scale – father’s attitude) [29, 30].

The described study is a part of a larger project [31], which was positively viewed by the Research Ethics Committee at the Psychology Department, University of Warsaw.

Results

In order to define differences between respondent groups, descriptive statistics were calculated and a one-way analysis of variance for independent groups was conducted as well as Scheffe’s test (*post hoc*). To find out the relationship between mental body representations and the retrospectively perceived attitudes of parents, Pearson’s *r* correlation coefficients were calculated. Data analysis was performed using SPSS version 25 and a *p*-value < 0.05 was considered statistically significant.

Differences in mental body representations

The results within mental body representations were compared between IBS patients (A), IBD patients (B) and healthy respondents (C). The results showed statistically significant intergroup differences within all mental body representations (Table 1). The values of body schema are significantly different in the compared groups. There is a small effect size $\eta^2 = 0.04$. On the basis of Scheffe’s test, it was concluded that the shape of the body schema in the group of IBS patients (A) is significantly different ($p < 0.01$) in comparison to healthy people (C).

There are statistically significant differences within body image between the studied groups. However, in this case the effect size is hardly significant $\eta^2 = 0.04$. The group of IBS patients (A) differs from the group of healthy people (C) in terms of own body acceptance ($p < 0.05$).

Table 1. Comparison of groups A, B and C in terms of average results of body representation

Mental body representations	Group						Significance of differences	
	A		B		C		F	post hoc
	M	SD	M	SD	M	SD		
Body schema	22.7	7.0	24.4	5.7	26.5	5.4	5.90*	A-C
Body image	19.8	10.5	23.1	8.0	24.5	7.6	4.80*	A-C

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Body sense	19.9	5.2	22.7	4.9	26.8	4.7	29.25***	A-B A-C B-C
Bodily sensations	14.4	7.3	18.5	6.7	25.8	5.7	47.42***	A-B A-C B-C
Body-related emotions	22.1	7.4	24.2	6.7	27.4	5.5	10.24***	A-C
Physical needs	22.6	6.0	24.8	5.0	26.8	5.0	9.61***	A-C

Levels of significance are marked as follows: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

A – group of irritable bowel syndrome patients, B – group of inflammatory bowel disease patients, C – healthy people; F – value of the analysis of variance; η^2 – value of Kruskal-Wallis H test

A single-factor analysis of variance showed the existence of significant differences between the groups within the body sense. In this case, a much higher effect size was obtained $\eta^2 = 0.24$, which indicates a high relevance of the group belonging factor in differentiating the level of the body sense. On the basis of Scheffe's test, it was decided that significant differences within the body sense occur among all respondent groups, *i.e.*, group A and B ($p < 0.01$), group A and group C ($p < 0.001$) and between group B and group C ($p < 0.001$).

A detailed analysis of the body sense structure, *i.e.*, the system of three representations: bodily sensations, body-related emotions and physical needs, indicated the following discrepancies between the studied groups. First of all, a single-factor analysis of variance showed the existence of significant differences between the groups within bodily sensations. The effect size turned out to be large $\eta^2 = 0.34$. Scheffe's *post hoc* test made it possible to conclude that statistically significant differences within the results on the body sensation scale occur between all analyzed groups, *i.e.*, group A and group C ($p < 0.001$), group of IBD patients (B) and group of healthy respondents (C) ($p < 0.001$) as well as between the group of IBS (A) and IBD (B) patients ($p < 0.01$). Secondly, the single-factor analysis of variance test showed the existence of significant differences between the groups as regards emotions directed towards own body. The size effect was medium $\eta^2 = 0.1$. On the basis of Scheffe's *post hoc* test, it was concluded that statistically significant differences within body-related emotions occur between group A and C ($p < 0.001$). Thirdly, application of the single-factor analysis of variance allowed to observed the existence of significant differences between groups with regards to physical needs. In this case, the effect size was medium $\eta^2 = 0.1$. Scheffe's *post hoc* test allowed to conclude that statistically significant differences within taking care to satisfy own bodily needs occur only between the group of IBS patients (A) and healthy respondents (C) ($p < 0.001$).

Differences in parents' attitudes perceived retrospectively

Average result values within ambition, control, role reversal, and love perceived retrospectively in the carers' (mother and father) behavior in the childhood in individual respondent groups are presented in Table 2.

Retrospectively perceived mother's attitudes in the childhood do not differentiate respondent groups in a significant manner. Whereas, in terms of the described father's attitudes, statistically significant intergroup discrepancies were reported only within the results on the scale of father's love. On the basis of Scheffe's test (*post hoc*), a significant difference was observed between the group of IBS patients (A) and healthy people (C) ($p < 0.05$), in the group of IBS sufferers the results on the love scale were lower.

Table 2. Comparison of groups A, B and C in terms of own parents' attitudes perceived retrospectively

Parents' attitudes		Group						Significance of difference		
		A		B		C		F	p	post hoc
		M	SD	M	SD	M	SD			
Mother's attitude	Ambition	11.8	3.6	12.3	2.6	12.0	2.8	0.50	0.61	
	Role reversal	11.4	4.1	11.2	3.2	10.6	3.2	0.78	0.46	
	Love	14.9	4.2	16.4	3.1	15.6	3.3	2.60	0.08	
	Control	10.4	3.9	9.3	2.7	10.0	3.2	1.89	0.15	
Father's attitude	Ambition	11.7	3.5	12.2	2.6	11.7	3.4	0.60	0.55	
	Role reversal	9.1	3.7	9.3	2.8	9.2	3.3	0.11	0.90	
	Love	12.2	4.7	13.7	3.9	14.4	4.0	4.44	0.01	A-C
	Control	11.1	4.4	10.3	3.4	9.7	3.4	2.10	0.12	

A – group of irritable bowel syndrome patients, B – group of inflammatory bowel disease patients, C – healthy people; η^2 – value of Kruskal-Wallis H test

IBS patients (A) perceive significant persons', mothers' as well as fathers', attitudes in a manner similar to the respondents with an IBD diagnosis (B). Respondents with IBS diagnosis (A) do not differ as regards evaluation of mother's attitude towards them in the childhood in comparison to healthy people (C), however they remember their father as less loving ($p < 0.01$).

Associations between body representations and parents' attitudes perceived retrospectively

Associations between mental body representations and parents' attitudes perceived retrospectively emerged as medium or weak (Table 3). The strongest associations occur between maternal control attitude and the body schema and the body sense. Mother's love remains in a significant positive and weak association with the body sense (body-related emotions and bodily needs). Maternal role reversal was weakly and negatively

correlated with body-related emotions. No significant correlations were observed between mother's ambition and the level of mental body representations development.

Table 3. Relationships between mother's and father's attitudes and mental body representations in group A – IBS patients (Pearson's r)

		Mental body representations					
		Body schema	Body image	Body sense	Body sensations	Body-related emotions	Physical needs
Mother's attitude	Ambition	-0.21	-0.11	-0.14	0.01	-0.22	-0.01
	Role reversal	0.09	0.07	-0.24	-0.16	-0.31*	0.03
	Love	0.24	-0.02	0.38**	0.22	0.29*	0.27*
	Control	-0.42**	-0.21	-0.40**	-0.22	-0.45**	-0.22
Father's attitude	Ambition	-0.22	-0.15	-0.17	-0.09	-0.19	-0.15
	Role reversal	-0.06	0.09	-0.06	-0.14	-0.03	-0.08
	Love	0.13	0.06	0.26**	0.20	0.26**	0.14
	Control	-0.24	-0.22	-0.37**	-0.20	-0.32**	-0.37**

Levels of significance are marked as follows: * $p < 0.05$; ** $p < 0.01$

Whereas, in the case of father's attitudes perceived retrospectively, the most significant associations were observed between father's love and control, and the body sense. Receiving love from a father is significantly positively, although weakly, related to more positive body-related emotions. The perception of a father as controlling is significantly, negatively and weakly correlated with negative emotions towards one's body and difficulties with fulfilling own physical needs. No significant correlations were observed between father's ambition and paternal role reversal, and mental body representations.

Discussion

The conducted research constitute a basis to formulate interesting conclusions about own body perception by IBS patients. The results of mental body representations analysis in this clinical group may refer to content-wise similar individual reports and results of qualitative research with a small group of respondents [6, 9, 10, 12, 32, 33]. The results of the conducted research are innovative, indicating that IBS is related to a significant disturbance of all mental body representations.

First of all, as it may seem clear, people with an IBS diagnosis, in comparison to healthy people, have a weaker sense of the body representation. They evaluate their own physical condition as poorer. They experience negative bodily sensations more frequently, which may be related to reports on an intensified visceral sensitivity and somatosensory amplification in functional gastrointestinal tract disorders [6, 10, 12]. They perceive their body as a source of more negative emotions and show a lower

ability to deal with strong emotions. Furthermore, lower results in terms of bodily needs representations indicate that people with irritable bowel syndrome are less prone to undertake actions aimed at taking care of their own body. Secondly, IBS patients are more dissatisfied with their appearance than healthy people, as indicated by lower results within body image. This result is coherent with research on quality of life of IBS patients, where the body image of people with functional bowel disorders is significantly lower in comparison to healthy people [9, 12]. The simplest explanation of the disorders within body image refers to phenomena observed in IBS, where one is dissatisfied with the appearance of one's stomach, which may change in size significantly due to inconvenient and persistent bloating [33]. In this sense, IBS really modifies bodily appearance, which may be reflected in an altered body image representation. Disturbances in body image may also indicate a presence of more profound disturbances within subjective body image, particularly expressed through a negative relationship with one's own physicality. Thirdly, IBS patients also show lower results within body schema in comparison to healthy people. Worthy of mention are the literature data, according to which IBS is often accompanied by other non-gastrological symptoms, such as a feeling of chronic fatigue, back pain or fibromyalgia typical conditions [11], which may affect general feeling of reduced condition.

In the research, the body schema is operationalized not only as a representation responsible for a feeling of good motor coordination, but it also refers to a general sense of self as a psychophysical unity and a sense of empowerment. The results of IBS patients show that they experience their own body more as a source of weakness and inaction than of power and a potential to act. With intensified symptoms, a body is experienced as a part of Self, which notoriously fails to cooperate with the will of a patient. Swedish qualitative research based on psychological in-depth interviews showed that IBS patients often describe themselves as detached from the body which stopped functioning in a comprehensible manner. Patients describe dysfunctional internal organs in external object categories and indicate an absence of trust towards their body, especially with respect to physiology, which they perceive as seriously limiting [32].

Moreover, the obtained results comparing experiences of people with intestinal diseases (A and B groups) indicate a significantly more frequent feeling of discomfort, tension or internal emptiness in IBS than IBD patients. One may say that body constitutes the main source of negative emotions to a significantly higher degree than for patients with such a serious diagnosis as Crohn's disease or ulcerative colitis. This result may be surprising. The nature of the two disorders, their typical course and differences regarding prognosis for future health, may suggest that IBD patients shall suffer at least the same number of inconvenient body experiences as IBS patients and perceive their general physical condition as similarly weaker. One of the potential interpretations of differences in the manner of experiencing own ill body is a difference between IBS and IBD in terms of diagnosis and treatment manners. IBD sufferers usually have a clear and unambiguous diagnosis. It is a positive diagnosis, which means that confirmation of the presence of an organic change is synonymous with the diagnosis of a particular disease unit diagnosis. IBS is not diagnosed in the same manner and the absence of

a real change in the body, which would be a clear source of a condition, may constitute a source of concern for the patients. Also, the primary cause of the condition is not defined and the treatment process often yields poor results. Such situation may cause a strong discomfort and a feeling of permanent frustration. The objects of frustration are often doctors, their useless – in the patients' opinions – recommendations, as well as patient's own body.

Research results demonstrated a surprisingly high similarity within retrospectively perceived parents' attitudes in groups A, B and C. IBS patients' descriptions of their mothers are similar to the control group respondents' descriptions, however, the conducted research shows a greater result diversification within perception of mother's attitude in IBS patients in comparison to respondents from the two remaining groups, which proves non-homogeneous internal images of mothers in group A and requires further research. Significant differences between the studied groups occur within father's attitude perceived retrospectively but only in one dimension – received love. IBS patients declared that as children they felt less loved by their father as compared with both control group respondents. The result indicates insufficient father's involvement in the relationship as perceived by respondents, his physical unavailability or insufficient display of closeness and care.

For many years, the subject literature focused on the meaning of the mother-child relationship in shaping of the bodily Self, excluding the role of a father figure, which is a general tendency in clinical studies, also on other aspects of developmental psychopathology. The results of this study show the significance of a father figure for the child in their bodily Self development, which exceeds the psychosexual dimension of corporeality. The study results require an analysis also in the light of systemic theories. Within this perspective the results regarding love received from a father in the IBS sufferers group suggest a circular change among all family members. Withdrawal of emotional closeness of a father in their relation with a child must then be linked to the change in the mother-child diad, e.g., mental absence of fathers may be related to a risk of child parentification by the mother [34].

In the group of IBS patients, there are significant relations between the indicators of parents' attitudes perceived retrospectively and the indicators of mental representations of the bodily Self. The strongest negative correlations occurred between mental body representations and mother's control perceived retrospectively. The more the patients perceive their mother in the past as imposing her will, intolerant of objection, expecting agreement and allowing penalizing the child for disobedience, the lower the body sense and body schema they have at present. Similarly, father's control correlates negatively with the body sense. Presumably, the attitude of a carer's adequate control is important for an appropriate process of a child's separation-individuation, therefore, also for shaping of mental body representations [25]. Expecting child's obedience involves parent's difficulties in adjusting to the child's need, actual for their developmental level. Excessive control over a child, failure to allow their own activity, failure to tune to their needs, external intervention, may become internalized. Then, they may focus more on external evaluation of themselves (including their body) and their behavior, than on contact with their authentic feelings, which constitute background for body sensations.

In the group of IBS patients, lovingness and closeness (love) experienced in a past relationship with a mother is significantly related to the level of the body sense development, and in particular with positive body-related emotions. Similar, although slightly weaker, relations refer to the perception of father's attitude. Ability to be physically and mentally available assumes that parents treat their child as dependent on them, therefore they may observe and answer their psychophysical needs empathetically. Then a child builds representation of themselves as a loved person worthy of attention of others. Body is the fundamental communication channel for pleasant feelings between a parent and a child, which constitutes a basis for development of an accepting attitude towards body and corporeality. The following trend was observed among the IBS respondents: the more frequently the mother failed to undertake her parental role, expecting care from the child, the more negative emotions the patients direct towards their own body now and the more difficult they find it to manage their experiences. Role reversal in the group of IBS patients is associated with experiencing own body as a source of negative emotions. This manner of experiencing oneself and body probably impedes the desomatization process [26], hence patients less frequently experience their own bodies as a psychosomatic unity and react with their bodies to emotional stimuli more often.

Parents' attitudes in the childhood perceived retrospectively are the most strongly associated with the body sense. Those experiencing adequate, sufficiently good care have a better chance to experience a relation in which their corporeality is accepted and constitutes an element of affectionate exchange, for example, through touch, look (parent's love attitude). They have a chance for autonomous development allowing them to focus on own body experiences and emotional feelings, and not carer's needs and expectations (non-controlling attitude, not excessively demanding, without a destructive role reversal with a child). The results of this study may be considered significant, taking into account that it really was difficult to capture the connection between mother's and father's attitude in the childhood perceived retrospectively and the present structure of mental body representations in adults. Schier demonstrated such connections in her research with regards to different respondent groups [21, 26, 27]. Of course, it would be worth extending the study and include a number of other variables (including attachment style) that would explore the relationship between the care received during childhood and the structure of mental body representation in adult IBS patients.

The presented study shows only the relationships between the indicators of psychosocial functioning of IBS patients. The complexity of IBS etiology means that a multidimensional understanding of patients' bodily experiences also requires consideration of many genetic or neurobiological aspects. For example, the results of the study indicate the existence of a close relationship between the presence of early life stress experiences and altered intestinal microbiota [6, 35] or altered functioning of the hypothalamic-pituitary-adrenal (HPA) axis, which is associated with the perception of pain, also visceral pain specific to IBS [36].

The presented study is not free from limitations. In terms of the selection of study participants, it is necessary to point out the relatively small sample size and a significant

over-representation of women. A strength of the research may be the fact that only patients who had a diagnosis issued by a gastroenterologist were included in the study. However this involves limiting interpretation of the obtained data to the respondents under medical care. It is estimated that it is a minority in the general population of IBS sufferers [37]. Furthermore, greater mental difficulties were observed in such a group as compared with IBS people who do not seek medical help [8]. The analysis of differences between the groups should also consider that the control group (C) included only somatically healthy respondents who did not report chronic diseases. Hence, it did not represent the general adult population.

Application of The Battery of Tests of the Body Self Representations [23, 28] to explore the manner of experiencing own body was considered a form of limitation to the study. The applied method was created recently, therefore it was rarely used. Considering the limitation in referring the results to other available results, there was a decision to apply it because it offers an opportunity to analyze the body image, body schema and body sense at the same time.

It should also be emphasized that *the Childhood Questionnaire* [29, 30] used in the study was not adapted in Poland, and the only assessment of psychometric properties of the Polish version are data on its reliability, hence the obtained results should be treated with some caution.

In the area of experiencing own body it is important to replicate the present results. It would also be interesting to compare consistency of results within the body sense obtained with the questionnaire method and the experimental method, such as measuring interoceptive accuracy (such as feeling the heartbeat), *i.e.*, consistence between a subjective evaluation of somatic sensations and objective measurements with the application of medical appliances [38].

To sum up, the obtained results confirm that the way IBS patients experience their own corporeality (particularly the body sense representation) and the related retrospective perception of their parents' attitudes in terms of received love and control in the patients' childhood, are important in the psychosocial functioning of IBS sufferers. Our research results may bear significant value within psychological help recommendations for those IBS patients who present serious disorders in experiencing own body (especially the body sense). Therefore, assistance methods supporting the process of body objectification, *i.e.*, experiencing oneself in a bodily manner, linking somatic experiences (such as stomach ache) with mental experiences, shall be justified.

Conclusions

1. People diagnosed with IBS experience their own body in a much more negative way than healthy people and patients with organic intestinal disorder, especially in terms of the body sense.
2. In the group of patients with IBS, there are significant relationships between the indicators of retrospectively perceived parents' attitudes and the indicators of mental body self representation. The more individuals perceive their mothers and fathers as controlling in the childhood, the lower body sense and body schema they

have at present. The more they describe their parents as loving, the more positive body-related emotions they show.

3. The results of the conducted research indicate the relevance of psychological help for people with IBS which would take into account their way of experiencing the body.

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