Searching for a Gastrointestinal Subgroup Within the Somatoform Disorders

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The authors examined whether patients suffering from functional gastrointestinal symptoms constitute a separate group within the broader concept of the somatoform disorders. The authors compared 103 patients with a severe gastrointestinal syndrome, 220 patients with a somatization syndrome according to DSM-IV, and 250 clinical control subjects with nonsomatoform mental disorders. The gastrointestinal group showed more catastrophizing thinking, complained more about autonomic sensations, felt bodily weaker, was less tolerant towards bodily discomfort, had developed more hypochondriacal fears and behaviors, was more depressed, and was more severely disabled in different areas of psychosocial functioning than the other groups. These differences, however, disappeared when general somatization was controlled for by analysis of covariance. Only a small effect related to dysfunctional cognitions remained specific to the gastrointestinal syndrome. Because these results do not confirm the idea of an independent gastrointestinal syndrome, general mechanisms of somatization seem to play the dominant role.

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There is broad scientific and clinical agreement about the somatoform disorders as a well-defined and valid clinical group. Somatizing patients present with physical symptoms for which no sufficient organic pathology can be found. Recent research has identified additional characteristics that distinguish somatoform disorders from other psychopathologies such as affective or anxiety disorders. Somatizing patients are more concerned with hypochondriacal fears of suffering from a serious illness,[1] tend to frequently visit doctors and other health specialists,[2] and perceive themselves as weak and disabled.[3] Serious psychosocial disabilities were also demonstrated for several subgroups of the somatoform disorders, especially when combined with major depression.[4]

Despite such common features, it is unclear whether the somatoform disorders should be seen as a homogeneous category or whether specific subforms must be differentiated. Traditional viewpoints are reflected by our current classification systems. The DSM-IV[5] differentiates between one polysymptomatic and two monosymptomatic disorders. Somatization disorder is the polysymptomatic condition because multiple physical symptoms from different sites of the body are required for this diagnosis. The monosymptomatic disorders are pain disorder for syndromes with pain as the dominant clinical feature, and conversion disorder for patients whose complaints are restricted to medically unexplained neurological symptoms. A similar approach has been taken by the ICD-10.[6] Other distinguishable syndromes such as functional gastrointestinal disorder and irritable bowel syndrome,[7] noncardiac chest pain,[8] tinnitus,[9] chronic fatigue syndrome,[10] or multiple chemical sensitivities[11] are potential candidates for

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further subgroups of the somatoform disorders in the future, but empirical findings about the relationship among these specific syndromes and the general framework of the somatoform disorders are still needed. Hypochondriacal disorder is somewhat different from the disorders mentioned above because it primarily refers to anxious beliefs and inappropriate convictions of being seriously ill.

Therefore, we evaluated the role of functional gastrointestinal symptoms from the perspective of the somatoform disorders. Most researchers consider medically unclear gastrointestinal dysfunctions as a more or less isolated disorder and interpret associations with symptoms of mental disorders as a problem of comorbidity.[12] Several studies have demonstrated that gastrointestinal dysfunctions such as irritable bowel syndrome are related to increased visceral sensitivity and altered bowel motility,[7] high levels of emotional distress,[13,14] and psychosocial impairments.[15] Similar results were found for patients with somatoform disorders. In addition, Rief et al.[3] reported in a recent study that somatizing patients tend to catastrophize benign bodily sensations as harmful and threatening, leading to inadequate beliefs about one's own physical functioning and health. It is not known whether this pattern of negative cognitions is typical also for functional gastrointestinal disorders.

We address the following questions in our study. How close are functional gastrointestinal symptoms associated with other medically unexplained symptoms? Do gastrointestinal patients show similar patterns of dysfunctional cognitions concerning bodily functioning and health beliefs than patients with a more general somatization syndrome? Are differences in psychopathology and psychosocial impairment better predicted by gastrointestinal symptoms or by general somatization?

METHODS

The Patient Sample

We collected data on gastrointestinal and general somatoform symptomatology from a sample of 751 patients who were selected from consecutive first contacts of treatment candidates at a center for behavioral medicine. Of those selected, 480 (63.9%) were women and 271 (36.1%) men. The sample's mean ± SD age was 45.7 ± 10.7 years, with a range from 17 to 76 years. Of these, 554 patients (72.5%) reported bodily symptoms for which their doctors had not found evidence of organic causes. Of these 554 patients, 348 (62.8%) were women and 206 (37.2%) were men, with a mean ± SD age of 44.9 ± 10.5 years within the range from 18 to 74 years. All patients gave their written informed consent to participate in our study.

The Center for Behavioral Medicine

All patients had been referred to the Roseneck Center of Behavioral Medicine. This research-oriented inpatient unit is affiliated with the medical faculty of the University of Munich. It is open to patients of all social and vocational levels. Indications for treatment are all mental and psychophysiological disorders except schizophrenia and related psychotic disorders, acute manic episodes, and severe disorders due to psychoactive substances. The Roseneck Center is typically chosen in Germany for cases with comorbidity of psychological and physiological symptoms, cases of chronic syndromes, and when appropriate outpatient treatment facilities are regionally lacking. The patients represent a high-risk group for somatization syndromes and serious physical conditions that could explain the somatic symptoms in the long-term course are extremely rare.

Procedure and Instruments

After the patients had contacted us for the first time in order to get registered for admission, they received a set of questionnaires by mail that included the following measures.

Screening for Somatoform Symptoms (SOMS). The SOMS is a questionnaire that includes all items relevant to diagnose somatoform disorders according to the criteria of DSM-IV and ICD-10. Among these items are 10 symptoms of the upper and lower gastrointestinal tract. Patients were instructed to report symptoms that were present during the past 2 years, when doctors did not find a sufficient explanation for the symptoms, and when the symptoms bothered the patients a lot. The SOMS assesses all physical symptoms from the DSM-IV and ICD-10 symptom lists of somatization disorder and from the ICD-10 category of somatoform autonomic dysfunction. The SOMS consists of 53 somatization symptoms plus 15 inclusion and exclusion criteria (such as duration of the disorder or frequency of doctor visits). The number of positive symptoms are added to the somatization index DSM-IV with 1 point for each of the 33 symptoms listed for DSM-IV somatization disorder. The correlation between this index, according to interview and questionnaire, is 0.71; further validation data are reported in the manual of the SOMS.[16]

Cognitions About Body and Health Questionnaire

(CABAH). We administered a newly developed instrument to assess dysfunctional attitudes and beliefs that were found to be typical for patients with somatoform disorders.[3] CABAH has been evaluated with good results for reliability and validity and comprises the following scales: Catastrophizing Interpretation of Bodily Complaints (e.g., "the most common reason for discomfort is a serious disease"); Autonomic Sensations (e.g., "I often feel my heart beating because my circulatory system is very sensitive"); Bodily Weakness (e.g., "after physical exertion I often have a feeling of being weak"); Intolerance of Bodily Complaints (e.g., "if something is wrong with my bodily sensations, it upsets me at once"); and Health Habits (e.g., "I am always careful to live really healthily"). In our recent study,[3] the internal consistency (Cronbach's alpha) of the CABAH was 0.90 in a clinical sample of 493 inpatients and all five scales showed good discrimination between somatoform and nonsomatoform groups.

Whiteley Index (WI). This short 14-item questionnaire is one of the most commonly used self-rating scales for hypochondriacal attitudes and behaviors. The German version was also validated and showed a factor structure comparable with the original English form.[17]

Beck Depression Inventory (BDI). We used the well-validated German version of this questionnaire to assess the degree of depressive symptomatology.[18]

Dysfunctional Analysis Questionnaire (DAQ). The DAQ was used in previous studies to determine how disabled patients with somatoform disorders are if different areas of psychosocial functioning are considered.,[4,19] The 45 items of the instrument are divided into 9 items related to impairments in each to the following areas: Social (e.g., "Taking initiative in meeting people" or "Feeling delighted on having guests"); Vocational (e.g., "Completing work in time" or "Opportunities for promotion at work"); Personal (e.g., "Ability to control one's anger" or "Interest in sex"); Familial (e.g., "Getting along with family members" or "Spending time with spouse"); and Cognitive (e.g., "Ability to remember names/faces of persons" or "Concentration"). Each item is rated on a five-point scale, comparing the present level of functioning with that before the onset of the disorder. The DAQ was found to be of good internal reliability and validity.[4]

Definition of Comparison Groups

To study if patients with a primary gastrointestinal syndrome can be distinguished from other somatoform and nonsomatoform patients, we defined the following comparison groups.

I. Gastrointestinal group. Based on the patients' report in the SOMS, a score of gastrointestinal complaints was computed. We considered 10 symptoms for this score; these were mainly the 7 gastrointestinal symptoms from the DSM-IV list (Abdominal Pain; Nausea; Bloating; Vomiting; Diarrhea; Food Intolerances, and Pain in the Rectum) that were supplemented by three additional items from the ICD-10 somatization disorder list (Bad Taste in Mouth or Excessively Coated Tongue, Regurgitation of Food, and Discharge of Fluids From Anus). The frequencies of the individual gastrointestinal symptoms in the 554 patients suffering from symptoms with medically unexplained origin are shown in Table 1. Abdominal pain and bloating were the most frequently reported symptoms with rates above 50%. We selected the 103 patients who presented with 6 or more gastrointestinal symptoms to constitute our gastrointestinal group, thus grossly representing the upper 20% values of the gastrointestinal syndrome (Table 2).

II. Other somatoform group. We assigned 220 patients not belonging to the gastrointestinal group, but otherwise fulfilling the criteria of either somatization disorder (DSM-IV) or the Somatic Symptom Index SSI-4,6 to this comparison group. The SSI-4,6 has been proposed by Escobar et al.[20] as a subsyndromal form of somatization disorder because it requires at least four somatoform symptoms in men and six in women (therefore also called abridged somatization disorder). The index was validated in other studies.[1,21] It is considered to reflect the clinical and scientific relevance of somatization more appropriately than the restrictive definition of somatization disorder alone.

TABLE 1. Frequencies of the ten gastrointestinal symptoms in 554 patients with medically unexplained physical complaints

Symptoms	Patients With Symptom, *n*(%)
Abdominal pain	307(55.4)
Nausea	258(46.6)
Bloating	302(54.5)
Vomiting[a]	100(18.1)
Diarrhea	148(26.7)
Intolerance of several foods	182(32.9)
Pain in the rectum	80(14.4)
Bad taste in mouth or excessively coated tongue	201(36.3)
Regurgitation of food	172(31.0)
Discharge of fluids from anus	44(7.9)

Note: [a]Other than during pregnancy.

III. Nonsomatoform patient group. Patients were finally selected as a clinical control group presenting with neither a gastrointestinal syndrome nor a clinically relevant somatoform symptomatology ($n = 250$). We chose as inclusion criteria: no more than two gastrointestinal symptoms from the above described gastrointestinal score and not qualifying for Escobar's SSI-4,6. The control group represents an unselected subsample with various mental disorders. Most of these patients suffered from depressive or anxiety syndromes.

Statistical Analysis

Group comparisons were performed by analyses of variance and Student's *t*-tests. Because our study sample is relatively large, significant results must not necessarily mean that large differences of clinical relevance are present. Therefore, we additionally computed effect sizes. We employed percentage of variance measures as effect sizes by using R^2 from multiple regression analysis (r^2 represents the amount of the variance of the dependent variable accounted for by the independent variables or by the different subgroups).[22]

RESULTS

Comparison of the Three Groups

The three groups were equal in age and gender, but significantly different means were found for all other variables except for health habits (Table 3). The high score for the gastrointestinal syndrome in the gastrointestinal group reflects the accuracy of our group definition. The gastrointestinal patients also had clearly higher values in the DSM-IV somatization index, showed more dysfunctional thinking, were more hypochondriacal, more depressed, and more severely impaired. The only exception was vocational functioning, although the gastrointestinal group was significantly more disabled in this area when compared with the nonsomatoform group.

TABLE 2. Distribution of the gastrointestinal syndrome score in 554 patients with medically unexplained physical complaints

Number of Symptoms	Patients With Symptom, *n*(%)
None[a]	71(12.8)
One	77(13.9)
Two	90(16.2)
Three	77(13.9)
Four	81(14.6)
Five	55(9.9)
Six	50(9.0)
Seven	26(4.7)
Eight	19(3.4)
Nine	7(1.3)
Ten	1(0.2)

Note: [a]None of the symptoms listed in Table 1.

The effect size analysis in Table 3 confirms that the gastrointestinal and general somatization scores differentiated best between our three subsamples; 32%–90% of the variance of these variables was accounted for by group membership. As expected, the group differences for these variables, as well as for most of our other variables, were greater between groups I and III than between I and II. It should be considered that effects are conventionally considered small if about 1% of the variance is accounted for by group membership and medium if values around 6% are reached.[23] The largest differences between gastrointestinal and other somatoform patients were found for dysfunctional cognitions, especially for autonomic sensations, bodily weakness, and the CABAH total score. Hypochondriacal tendencies differed most clearly between the gastrointestinal and nonsomatoform groups.

Controlling for General Somatization Symptoms

Because the gastrointestinal syndrome and the DSM-IV somatization score were highly correlated($r = 0.77$), it may be suspected that the group differences shown in Table 3 are due to differences in general somatization and not the gastrointestinal syndrome. This assumption was tested with analyses of covariance using the DSM-IV somatization index as the covariate. Results are summarized in Table 4 by means of effect size analysis.

In fact, all group differences except one disappeared after controlling statistically for the DSM-IV somatization score. A specific impact of group membership remained only for the CABAH total score with 1.8% of variance over and above what had already been accounted for by general somatization. Table 4 also shows that all four clinical variables are related stronger to somatization than to the gastrointestinal syndrome.

DISCUSSION

There is increasing evidence that a dysfunctional pattern of interoception, cognition, emotion, and behavior plays a central role for all types of disorders characterized by med-

TABLE 3. Comparison of the three study groups

Variables	I. Gastrointestinal Group ($n=103$)	II. Other Somatoform Group ($n=220$)	III. Nonsomatoform Group ($n=250$)	Three-group Comparison	Contrasting I vs. II		Contrasting I vs. III	
					Significance	Effect Size[a]	Significance	Effect Size[a]
Age	44.2(10.7)	44.2(10.3)	46.1(10.7)	$F = 2.31$	—	—	—	—
Women	57.3%	58.6%	66.8%	$\chi^2 = 4.47$	—	—	—	—
Gastrointestinal syndrome score	6.9(1.0)	3.1(1.4)	0.9(0.8)	$F = 1012.2$*	$t = 23.8$*	63.9	$t = 56.9$*	90.2
Somatization index DSM-IV	13.5(3.8)	8.9(2.9)	4.5(3.0)	$F = 335.3$*	$t = 12.2$*	31.8	$t = 24.0$*	62.2
CABAH 1: Catastrophizing	17.0(7.7)	14.1(5.9)	15.0(8.1)	$F = 5.05$*	$t = 3.53$*	3.9	$t = 2.04$*	1.3
CABAH 2: Autonomic Sensations	6.6(2.6)	5.0(2.6)	4.6(2.9)	$F = 19.0$*	$t = 5.17$*	8.2	$t = 5.89$*	9.5
CABAH 3: Bodily Weakness	11.5(3.5)	9.4(3.6)	8.4(4.0)	$F = 22.3$*	$t = 4.66$*	6.7	$t = 6.53$*	11.8
CABAH 4: Intolerance of Complaints	6.2(1.6)	5.7(1.5)	5.6(1.6)	$F = 6.40$*	$t = 2.84$*	2.5	$t = 3.49$*	3.5
CABAH 5: Health Habits	5.7(1.7)	5.3(1.8)	5.4(2.1)	$F = 1.09$	—	—	—	—
CABAH Total	47.5(11.8)	39.5(10.3)	39.0(13.9)	$F = 16.0$*	$t = 5.70$*	10.6	$t = 4.94$*	7.7
Whiteley Index 1: Disease Phobia	3.7(1.9)	3.1(1.8)	2.5(1.9)	$F = 14.7$*	$t = 2.70$*	2.5	$t = 5.15$*	8.1
Whiteley Index 2: Somatic Preoccupation	2.2(0.9)	1.7(1.0)	0.9(1.1)	$F = 62.8$*	$t = 3.45$*	4.0	$t = 10.0$*	25.1
Whiteley Index 3: Disease Conviction	1.9(1.4)	1.3(1.1)	1.1(1.1)	$F = 14.2$*	$t = 3.41$*	4.0	$t = 5.18$*	8.2
Whiteley Index Total	8.3(3.2)	6.6(3.2)	4.9(3.5)	$F = 38.6$*	$t = 4.34$*	5.7	$t = 8.24$*	17.0
Beck Depression Inventory	26.5(12.0)	22.5(10.0)	17.8(9.9)	$F = 27.0$*	$t = 3.02$*	2.9	$t = 6.82$*	12.5
DAQ 1: Social Disabilities	76.0(17.1)	71.5(18.4)	66.5(18.8)	$F = 10.6$*	$t = 2.07$*	1.3	$t = 4.39$*	5.3
DAQ 2: Vocational Disabilities	70.1(18.8)	65.7(18.5)	61.8(18.1)	$F = 7.24$*	$t = 1.92$	—	$t = 3.71$*	4.2
DAQ 3: Personal Disabilities	70.5(13.8)	65.6(14.4)	61.9(14.1)	$F = 13.8$*	$t = 2.87$*	2.5	$t = 5.22$*	7.3
DAQ 4: Familial Disabilities	63.3(20.5)	59.0(16.3)	56.0(16.3)	$F = 6.70$*	$t = 2.04$*	1.3	$t = 3.52$*	3.5
DAQ 5: Cognitive Disabilities	63.1(15.6)	58.3(14.6)	55.4(13.1)	$F = 11.0$*	$t = 2.68$*	2.2	$t = 4.74$*	6.1
DAQ Total	68.7(13.8)	64.1(13.5)	60.3(13.2)	$F = 15.0$*	$t = 2.82$*	2.4	$t = 5.37$*	7.6

Note: [a]Each dependent variable was predicted from group membership (regression analysis); *$P < 0.01$.

ically unexplained physical symptoms. Patients with somatoform disorders tend to be hypersensitive to bodily changes, interpret them as dangerous, and focus selectively on negative sensations. Barsky and Wyshak[24,25] used the term "somatosensory amplification" to summarize this perceptual and cognitive style of somatizing patients. As a consequence, negative emotions and abnormal illness behaviors, such as doctor-shopping, develop in many cases.[26]

Although these perceptual and cognitive processes can be linked to different clinical conditions, it is unclear why some patients develop only a few symptoms limited to one organ system (monosymptomatic) while others suffer from widespread complaints across multiple areas of the body (polysymptomatic). Our present study found that patients with high gastrointestinal syndrome scores were more distorted in their body-related cognitions, had higher scores of hypochondriasis and depression, and were generally more disabled than patients with nongastrointestinal somatoform disorders and nonsomatoform controls. However, the gastrointestinal syndrome score was highly correlated with the general somatization score. Because of this overlap, the effects attributed to the gastrointestinal syndrome disappeared after controlling for the influence of somatization.

Therefore, we must conclude that evidence for a distinct gastrointestinal syndrome apart from general somatization could not be demonstrated. Our results are more in line with the suggestion that gastrointestinal symptoms are related to similar mechanisms as those found in nongastrointestinal symptoms of somatization. The perceptual and cognitive style of somatosensory amplification seems to be a common factor for all kinds of somatization symptoms.

The covariation of gastrointestinal and general somatization needs more attention in future research. Because only a few studies in the field of functional gastrointestinal disorders employ broader measures of somatization, it cannot be differentiated whether effects are indeed attributable to gastrointestinal symptomatology or, more likely, to a more basic somatization process. Our data suggest that somatization represents a first-order condition because it predicted all dependent variables more precisely than the gastrointestinal score. Although other studies are needed to replicate these findings, it can be tentatively stated that variables, like selective attention on bodily processes and misinterpretation of bodily sensations, contribute more to the development of gastrointestinal symptomatology than psychophysiological abnormalities of the gastrointestinal tract alone. The high relevance of somatic perception and attribution in gastrointestinal patients was also demonstrated in recent studies by Gomborone et al.[27] and van Dulmen et al.[28]

As with most other studies, there are some limitations to our work. First, we studied a selected sample of patients applying for treatment in a specialized inpatient unit; these patients may not be comparable with those usually seen in primary care practices of general practitioners or specialists in gastroenterology. It could be assumed that primary care patients show less general somatization and therefore a more specific gastrointestinal syndrome. However, we are not aware of any studies with gastrointestinal patients in the primary care setting that had controlled for general somatization. A second shortcoming of our study is that we did not use the specific criteria of irritable bowel syndrome or functional dyspepsia.[29] Our definition of functional gastrointestinal disorder was based on the gastrointestinal symptoms included in the DSM-IV and ICD-10 lists of somatization disorder. However, we believe that there is large congruence between our definition and the exact criteria of irritable bowel syndrome and functional dyspepsia.

Although the broad concept of somatoform disorders emphasizes similarities and common mechanisms, it may be important from a clinical point-of-view to distinguish subgroups according to their symptom patterns. Different sorts of somatic symptoms may lead to different consequences. For example, headaches may be linked to concentration difficulties, pseudoneurological muscle weak-

TABLE 4. Effect size analysis comparing the gastrointestinal group vs. other somatoform group

Variables	Variance Accounted for by Group Membership	Variance Accounted for by Group Membership After Controlling for Somatization Index	Variance Accounted for by Somatization Index Alone	Variance Accounted for by Gastrointestinal Syndrome Score Alone
CABAH total	10.6*	1.8*	14.4*	5.7*
Whiteley Index total	5.7*	0.9	8.0*	4.8*
Beck Depression Inventory	2.9*	<0.1	10.0*	0.8
DAQ total	2.4*	0.1	5.1*	0.6

Note: $*P < 0.05$.

ness to inactivity, dizziness to social withdrawal, and gastrointestinal symptoms to avoidance behaviors related to eating and defecation. Modern treatment approaches must take such differences into account because specific biomedical (e.g., medication) and psychosocial interventions (e.g., improving coping capacities) can be derived.

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