General Hospital Psychiatry 64 (2020) 56–62

Contents lists available at ScienceDirect

General Hospital Psychiatry

journal homepage: www.elsevier.com/locate/genhospsych

# Distinct associations of DSM-5 Somatic Symptom Disorder, the Diagnostic Criteria for Psychosomatic Research-Revised (DCPR-R) and symptom severity in patients with irritable bowel syndrome

Piero Porcelli[a,*], Massimo De Carne[b], Gioacchino Leandro[b]

[a] Department of Psychological, Health, and Territorial Sciences, University of Chieti, Italy
[b] Department of Gastroenterology, Scientific Institute for Digestive Disease "Saverio de Bellis" Hospital, Castellana Grotte, Italy

ABSTRACT

*Objective:* The clinical management of high symptom severity is a challenging task with patients with functional somatic disorders. We investigated the extent to which DCPR-revised (DCPR-R) syndromes and the DSM-5 category of Somatic Symptom Disorder (SSD) were able to predict symptom severity in 203 consecutive tertiary care patients with irritable bowel syndrome (IBS).

*Method:* Semistructured interview were used for assessing DCPR-R and validated scales for SSD (combining PHQ-12 and WI-7), severity of symptoms (IBS-SSS), psychological distress (HADS), and psychosocial functioning (SF-12).

*Results:* Compared to moderate severity (IBS-SSS = 175–300), patients in the high range of severity (IBS-SSS > 300) had significantly more DCPR-R syndromes (particularly alexithymia and persistent somatization), higher psychological distress, and poorer psychosocial functioning, but showed no difference for SSD.

DCPR-R, particularly alexithymia and persistent somatization, significantly and independently predicted IBS severity by explaining 18.5% of the IBS-SSS variance with large effect size (d = 1.18), after controlling for covariables. Conversely, SSD was not able to significantly predict IBS severity.

*Conclusions:* This study highlights the need of an integrative approach in the medical setting. Psychosomatic factors play a relevant role in the individual perception of symptom severity and should be carefully evaluated for clinical management of functional syndromes.

## 1. Introduction

Medical diagnosis identifies the disease underlying the mere manifestation of separate symptoms, enhancing decision making, and improving the patient's overall health status [1,2]. Nevertheless, the effectiveness of the standard diagnostic process may be limited by a number of factors such as the lack of biomarkers that identify the underlying pathophysiological mechanism, and a wide inter-individual variability of symptoms and course of illness [3]. Namely, the more differ the patient's behaviors from those expected or recommended, the less likely the course of syndromes can be predicted only by biomedical factors [4].

Symptom-based approaches to diagnosis are common in medical fields where the classic biomedical model cannot be applied, such as mental disorders and functional gastrointestinal disorders (FGID). Irritable bowel syndrome (IBS) is one of the most prevalent FGID (estimated at 12%–15%) and is characterized by recurrent abdominal pain associated with abnormal bowel habits [5,6]. It is conceived as a multifactorial disorder of the brain-gut axis regulation involving any combination of altered GI motility, visceral hypersensitivity, gut microbiota, and central nervous system processes without evidence of organic disease [7,8]. Comorbidity with other functional [9,10] and mental disorders as anxiety and depression is frequent [11]. Other clinically relevant psychological constructs, such as catastrophizing thinking, somatosensory amplification, alexithymia, and visceral sensitivity, largely affect the clinical manifestations of IBS symptoms [12–14]. Typically, secondary and tertiary care patients are the most frequently affected by higher IBS symptoms severity and psychological comorbidity, involving subsequent difficult diagnostic and treatment decision making process [15].

Some IBS patients may meet diagnostic criteria for somatic symptom disorder (SSD), which requires *(A)* one or more distressing somatic symptoms, *(B)* excessive thoughts, feelings, and/or behaviors associated to health concerns, and *(C)* duration > 6 months [16]. Since doubts were raised on the clinical utility of SSD in the identification of psychological factors influencing the course of medical disorders [17], the need for complementary measures was called upon [18]. Among the complementary methods, the Diagnostic Criteria for Psychosomatic Research (DCPR) was proposed. It includes a set of psychosomatic syndromes whose prognostic role in the development, course, and outcome of somatic diseases is documented in a large body of literature [19]. The aim of using the DCPR is to expand the traditional biomedical

* Corresponding author at: Department of Psychological, Health, and Territorial Sciences, Via dei Vestini, 31, 66100 Chieti, Italy.
*E-mail address:* piero.porcelli@unich.it (P. Porcelli).

https://doi.org/10.1016/j.genhosppsych.2020.03.004
Received 9 September 2019; Received in revised form 26 January 2020; Accepted 9 March 2020

model of diagnosis by translating psychosocial variables that derive from psychosomatic research into operational tools. DCPR include diagnostic criteria for abnormal illness behavior (disease phobia, thanatophobia, health anxiety, and illness denial), different modalities of somatization (persistent somatization, functional somatic symptoms secondary to a psychiatric disorder, conversion symptoms, and anniversary reaction), and affective factors (irritable mood, type A behavior, demoralization, and alexithymia). They have undergone extensive clinical and psychometric validation, have been used in several medical and psychiatric settings in different countries and cultures, and a recent review of the literature highlighted their clinical utility [19]. A recent revised version (DCPR-R) added diagnostic criteria for allostatic overload and hypochondriasis [20] and a revised semistructured interview for a more accurate fitting with diagnostic criteria.

The aim of the present exploratory study was to investigate the ability of SSD and DCPR-R to identify patients with more severe manifestations of IBS symptoms. To our knowledge, this is the first study investigating the ability of SSD and DCPR-R in differentiating among different degrees of severity in IBS. IBS individuals are often seen as "difficult" patients because of their resistance to treatment, associated psychopathology, high rates of medical visits, feelings of anger and impotence by both clinicians and patients, and poor quality of the patient-doctor therapeutic bonds [21]. Furthermore, they may show even higher psychological distress than patients affected by inflammatory bowel disease (IBD) and may be specifically characterized by higher illness anxiety [22] that can aggravate their symptom perception. Therefore, as clinical experience and the existing literature suggest [10,12,13], IBS patients with higher psychosomatic correlates (by DCPR-R) and diagnosed with SSD would present with more severe GI symptoms.

## 2. Methods

### 2.1. Patients

Participants were consecutive adult outpatients meeting criteria for IBS (see below) referred to the FGID Unit of the Scientific Institute for Digestive Diseases (Castellana Grotte, Italy) for their first time between 2011 and 2015. Patients were included if aged 18–74 and were diagnosed with IBS after appropriate investigation stating the absence of organic disease. They also presented with a chronic course of symptoms at a high perceived distressing level lasting for at least 6 months. Rome III criteria were taken into account for IBS diagnosis, since the current Rome IV criteria [23] were not available at the time of the recruitment. They included recurrent abdominal pain or discomfort at least 3 days per month in the last 3 months associated with 2 or more of the following: improvement with defecation, onset associated with a change in frequency of stool, and onset associated with a change in form of stool [24]. Exclusion criteria were the presence of a comorbid organic GI disease, severe medical comorbidity, pregnancy, mental retardation, current or past diagnosis psychotic disorders and substance or alcohol abuse. All the patients gave written informed consent to participation in the study.

The study was approved by the local Ethics Committee.

### 2.2. Measures

#### 2.2.1. SSD

Because of the well-known difficulties in operationalizing diagnostic criteria (e.g., see [25,26]), SSD was diagnosed as follows. For Criterion A (presence of one or more somatic symptoms that are distressing or result in significant disruption of daily life), patients had to report at least one severely bothered symptom on a list of 12 somatic symptoms assessed on the PHQ-12, a modified version of the widely used Patient Health Questionnaire-15 (PHQ-15) [27], that excluded 3 GI symptoms [28]. Participants rated the severity of each symptom on a 3-point Likert scale from 0 = 'not bothered' at "all" to 2 = 'bothered a lot'. Only items scored as 'very bothersome' (score = 2) were considered. For Criterion B (excessive thoughts, feelings, or behaviors related to the somatic symptoms or associated health concerns), patients had to score > 2.5 on the 7-item Whiteley Index (WI-7) [29,30], a validated and widely used scale for health anxiety. Items are scored in a yes/no format resulting in a total score ranging from 0 (no or very low illness concerns) to 7 (very high illness concerns), with > 2.5 identified as a cutoff score [31]. Criterion C (> 6-month duration) was met by all the recruited patients. In sum, following the strategy already adopted by some previous investigations (e.g., [32,33]), SSD was diagnosed by the joint combination of *(a)* score = 2 to > 1 symptom to the PHQ-12, and *(b)* WI-7 > 2.5. Within this sample, Cronbach's α was 0.81 and 0.77 for the PHQ-12 and WI-7, respectively.

#### 2.2.2. DCPR-R

The DCPR-R syndromes [19,20] were evaluated using the Structured Interview for DCPR-R which is composed of 57 items scored in a yes/no response format. It aimed at evaluating the presence of one or more of the following 14 psychosomatic syndromes: allostatic load, hypochondriasis, alexithymia, type A behavior, irritable mood, demoralization, disease phobia, thanatophobia, health anxiety, illness denial, functional somatic symptoms secondary to a psychiatric disorder, persistent somatization, conversion symptoms, and anniversary reaction (the unpublished manual of the semi-structured interview for DCPR-R is available upon request from the first author). The interview was administered by trained assessors and supervised by a senior researcher (PP). Criteria reliability was found to be high for all of the 14 psychosomatic syndromes with kappa values higher than 0.70.

#### 2.2.3. Severity of symptoms (IBS-SSS)

IBS severity was assessed using the Irritable Bowel Syndrome Severity Scoring System (IBS-SSS) [34]. Scoring is based on frequency and severity of symptoms (abdominal pain and distension), satisfaction with bowel habit, and life interference of symptoms in the previous 10 days. Patients are classified as having mild (score < 175), moderate (175–300), and severe (> 300) IBS. The IBS-SSS has been widely used as external criterion for establishing the severity of IBS in the literature [35]. Within this sample, Cronbach's α was 0.79.

#### 2.2.4. Psychological distress (HADS) and psychosocial functioning (SF-12)

The Hospital Anxiety and Depression Scale (HADS) [36] was used for assessing psychological distress. The HADS is a 14-item self-report scale composed of two 7-item scales for anxiety (HADS-A) and depression (HADS-D) and is specifically designed for medical patients. To this extent, it eliminates somatic symptoms that generally overlap with medical illness. The HADS has been widely used in various medical settings, including gastroenterology, demonstrating good reliability and validity [37].

Responses are scored on a 4-point scale ranging from 0 (no symptom) to 3 (definite experience of symptoms). For each subscale, scores may vary from 0 (absence of symptoms) to 21 (high symptoms). Within this sample, Cronbach's α was 0.85 and 0.82 for the HADS-A and HADS-D subscales, respectively.

Psychosocial functioning was assessed with the Short Form-12 Health Survey (SF-12) scale [38], a shortened version of SF-36 [39]. The scale includes 12 questions related to physical functioning and mental and emotional status forming the physical component summary (PCS) and the mental component summary (MCS). Lower scores indicate worse psychosocial functioning. It has been widely used in various clinical and research settings as well as in population studies [40,41]. Within this sample, Cronbach's α was 0.78 and 0.80 for the MCS and PCS, respectively.

### 2.3. Statistical analysis

Between-group differences were evaluated with a two-tailed *t*-test and a chi-square test.

The distinct roles played by DCPR-R syndromes and SSD diagnosis in explaining IBS severity were evaluated using a series of hierarchical regression and effect size analyses within homogeneous patient strata. Hierarchical regressions aimed to evaluate the ability of DCPR-R and SSD categories in independently predicting IBS severity (outcome variable), controlled for psychological distress and psychosocial functioning, as well as other sociodemographic and IBS-related variables that were entered in forced blocks of predictors. The relation underlying DCPR-R syndromes, SSD, and IBS severity was evaluated through the effect sizes in homogeneous strata by means of the standardized mean difference, referred to as Cohen's *d* [42] or standardized mean difference statistic. Cohen's *d* is a scale-free measure of the separation between 2 group means that is widely used to express the practical significance of a difference. A standardized effect size of 0–0.2 is considered as trivial, 0.2–0.5 as small, 0.5–0.8 as moderate, and 0.8 or greater as large. All statistical analyses were run under SPSS, version 25.0 for Windows. The level of significance was set at 95%.

## 3. Results

### 3.1. Characteristics of the patients

Of the 224 eligible patients, 203 (90.6%) were included. The main reason for denying participation was lack of time. Patients were mostly females ($n$ = 145, 71.4%), the mean age was 33.7 ($sd$ = 11.5) years-old, and the mean education years was 12.5 ($sd$ = 3.5). Most patients were either married ($n$ = 91, 44.8%) or lived alone ($n$ = 99, 48.8%). Sociodemographic and GI variables didn't show any significant difference between included and excluded patients. Patients presented with a long-lasting duration of illness (mean in months = 44.5, $sd$ = 33.7; median = 36; range 10–120 months) and, based on IBS-SSS threshold scores (see Methods), reported moderate ($n$ = 110, 54.2%) and high ($n$ = 93, 45.8%) severity. As expected, about half of them ($n$ = 93, 45.8%) satisfied criteria for another FGID.

### 3.2. SSD and DCPR-R

A total of 55 (27.1%) patients were diagnosed with SSD (see Section 2.2.1), whereas 78 (38.4%) patients scored > 1 somatic symptom as very bothersome on the PHQ-12 (84.6% of whom reported 2 to 3 symptoms and 15.4% reported 4+ symptoms) and 65 (32%) scored > 2.5 on the WI-7.

A total of 182 (89.7%) patients were diagnosed with at least one DCPR-R syndrome and 139 (68.5%) with > 1 DCPR-R syndromes. Since most DCPR-R syndromes occurred at a low prevalence, only those whose prevalence was > 20% were considered in the analysis (from now on, “most prevalent DCPR-R”), namely alexithymia ($n$ = 95, 46.8%), persistent somatization ($n$ = 69, 34.0%), demoralization ($n$ = 65, 32.0%), and allostatic load ($n$ = 40, 19.7%, that however corresponded to 25.3% within the most frequent DCPR-R). Overall, 158 (77.8%) patients had at least one of the most prevalent DCPR-R syndromes and 95 (46.8%) more than one (Table 1).

Thirty-one patients (15.3%) did not meet either DCPR-R or SSD criteria. A total of 41 (20.2%) patients had positive criteria for both SSD and DCPR-R. The overlap of SSD with DCPR-R (41 out of 55 patients diagnosed with SSD, 74.5%) was 3 times higher than the overlap of patients with DCPR-R and also SSD (41 out of 158 with most prevalent DCPR-R, 25.9%) (Figs. S1 and S2).

### 3.3. Between-group comparisons

Table 2 shows the comparisons of sociodemographic, clinical characteristics (upper part), and diagnostic criteria (lower part) between patients with moderate and severe IBS.

Severe IBS patients were significantly older ($d$ = 0.71) and prevalently women ($d$ = 0.45), had higher psychological distress (anxiety, $d$ = 0.65; depression, $d$ = 0.72) and impaired psychosocial functioning (physical component, $d$ = 0.98; mental component, $d$ = 0.95). No difference was found for illness duration, overlap with other functional GI disorders, non-GI somatic symptoms (PHQ-12), and excessive health worries (WI-7).

SSD diagnosis was present in 55 (27.1%) patients and did not differentiate moderate (28.2%) from severe IBS patients (25.8%) ($d$ = 0.06). Conversely, the presence of one DCPR-R syndrome was found in 96.8% of patients with severe IBS versus 61.8% of patients in the moderate group ($d$ = 1.58). However, only alexithymia (63.4% and 32.7% in the severe and moderate groups, respectively) ($d$ = 0.77) and persistent somatization (46.2% and 23.6% in the severe and moderate groups, respectively) ($d$ = 0.60), but not demoralization ($d$ = 0.17) and allostatic load ($d$ = 0.04), differentiated significantly between the two groups.

### 3.4. Predicting IBS severity from DCPR-R syndromes and SSD

The next step was to explore which factors independently predicted IBS severity by multiple regression. The IBS-SSS score served as the dependent variable and DCPR-R and SSD as independent variables in the first two predicting blocks. Furthermore, given the between-group differences, age, gender, psychological distress (HADS-A and HADS-D), and psychosocial functioning (PCS and MCS) were added as independent variables in the third block.

The results were consistent across all 3 models (Table 3).

To facilitate the comparisons across predictors on the same scale, semipartial correlations (last column of Table 3) indicate correlations between the dependent variable and each independent variable, after removing the common variance from the predictor only. They indicate the proportion of IBS-SSS associated uniquely with the predictor. In the first model, having been diagnosed with most prevalent DCPR-R significantly and independently predicted IBS-SSS by explaining 18.5% of its variance, to which the third block – mainly impaired mental functioning (MCS) – added 21% of further explained variance. Semipartial *r*s confirmed that DCPR-R and, at a lesser extent, MCS were associated with IBS severity ($r$ = 0.37 and $r$ = −0.20, respectively). In the second model, psychological scores in the third block (mainly anxiety, semipartial $r$ = 0.19 and mental dysfunctioning, semipartial $r$ = −0.18) uniquely and independently predicted 23% of the IBS severity variance. Alexithymia added a further 9% of explained variance (semipartial $r$ = 0.22). In the last model, psychological scores in the third block (mainly, mental dysfunctioning, semipartial $r$ = −0.19) uniquely and independently explained 29% of the IBS severity variance and persistent somatization added a further 6% of explained variance (semipartial $r$ = 0.18). SSD, forced in the second block in each model, did not contribute to significantly explain IBS severity.

As stated in the Methods (see Section 2.2.1), PHQ-12 was considered as a proxy indicator for criterion A of SSD and WI-7 for criterion B. However, 3 GI-related symptoms of the full PHQ-15 version [27] were excluded in the PHQ-12 [28] because of the very nature of IBS and the WI-7 assesses only one of the 3 dimensions of criterion B (health anxiety). Therefore, the regression analyses were replicated by replacing SSD with PHQ-12 (Table S1) and WI-7 (Table S2) in the second predicting block. In both regression models, there were few negligible differences, if any, with data shown in Table 3.

After testing the statistical significance of the association between DCPR-R and IBS-SSS scores in a multivariate analysis, we made a different use of these figures. Patients were stratified by the presence of DCPR-R and SSD and in each stratum we calculated the effect size as the difference in means between participants with and without SSD and DCPR-R divided by the pooled standard deviation (Table 4).

**Table 1**
Main diagnostic features of DCPR syndromes.

| Syndrome | Criteria | N (%) |
|---|---|---|
| Alexithymia | At least 3 of the following 6 characteristics are present: inability to use appropriate words to describe emotions; tendency to describe details instead of feelings; lack of a rich fantasy life; thought content associated more with external events than with fantasy or emotions; unawareness of the common somatic reactions accompanying the experience of a variety of feelings; occasional but violent and often inappropriate outbursts of affective behavior. | 95 (46.8) |
| Persistent somatization | A functional medical disorder (e.g., fibromyalgia, esophageal motility disorders, irritable bowel syndrome, neurocirculatory asthenia, urethral syndrome), whose duration exceeds 6 months, causing distress or repeated medical care or resulting in impaired quality of life. Additional symptoms of autonomic arousal and exaggerated side effects from medical therapy are present, indicating low sensation or pain thresholds and high suggestibility. | 69 (34.0) |
| Demoralization | A feeling state characterized by the patient's consciousness of having failed to meet his/her own expectations (or those of others) or being unable to cope with some pressing problems. The patient experiences prolonged and generalized (at least 1-month duration) feelings of helplessness or hopelessness or giving up. The feeling closely antedated the manifestations of a medical disorder or exacerbated its symptoms. | 65 (32.0) |
| Allostatic overload | The presence of a current identifiable source of distress in the form of recent life events and/or chronic stress; the stressor is judged to tax or exceed the individual's coping skills when its full nature and circumstances are evaluated. The stressor is associated with 1 or more of the following manifestations, which have occurred within 6 months after the onset of the stressor: psychiatric symptoms according to the DSM classification; psychosomatic symptoms according to the DCPR classification; significant impairment in social or occupational functioning or in psychological well-being. | 40 (19.7) |

Effect sizes within each stratum suggested a distinct association between IBS severity and DCPR-R, with low or null contribution of SSD. In particular, the presence of most frequent DCPR-R was largely associated with IBS-SSS scores ($d$ = 1.18), even slightly larger with the joint presence of SSD ($d$ = 1.07). Effect sizes were in the moderate range when alexithymia ($d$ = 0.60) and persistent somatization ($d$ = 0.58) were considered individually, and again slightly larger with the joint presence of SSD ($d$ = 0.50 and $d$ = 0.43, respectively).

## 4. Discussion

One of the challenges with functional syndromes is that both patients and clinicians need to reframe the classical biomedical explanations into a broader view of biopsychosocial modulators, particularly when syndromes are multifactorial as is the case of IBS [43,44]. The assessment of IBS severity is complex, as it is related to the subjective interpretation of gut sensations compared with past experiences of the same or similar symptoms, and to the words chosen for describing symptoms. In one word, severity in IBS is a cognitive process reflecting a "biopsychosocial composite of patient reported gastrointestinal and extra-gastrointestinal symptoms, degree of disability, and illness perceptions and behaviors" [45]. The relevance of cognitive factors in explaining IBS severity was evidenced in several studies over the last decade, showing the activation of brain regions involved in the cognitive and affective processing of pain [8], the comorbidity with mood and anxiety disorders [11], the presence of sub-threshold levels of emotional distress, health anxiety, attentional bias, somatic amplification, and catastrophizing thinking [12]. Therefore, psychological factors play a key role in determining how symptoms are experienced (intensity) and reported (quality). In turn, these symptoms may influence the clinical judgment and even the treatment options for the treating physician [43].

**Table 2**
Between-group differences of patients with moderate and high severity IBS.

| | Moderate IBS (IBS-SSS = 175–300) ($n$ = 110) | | Severe IBS (IBS-SSS > 300) ($n$ = 93) | | $t_{(201)}$ | $\chi^2$ | $p$ | $d$ |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | | | |
| Age | 30.22 | 9.37 | 37.94 | 12.42 | 5.04* | | .003 | 0.71 |
| Gender (F) | $n$ = 71 (64.5%) | | $n$ = 74 (79.6) | | | 5.57* | .02 | 0.45 |
| Duration of illness (months) | 45.91 | 32.61 | 42.92 | 35.10 | 0.63 | | .45 | 0.09 |
| FGID overlap | $n$ = 16 (14.5%) | | $n$ = 18 (19.4%) | | | 0.84 | .36 | 0.19 |
| PHQ-12 | 4.83 | 3.91 | 4.88 | 3.93 | 0.10 | | .90 | 0.01 |
| WI-7 | 1.89 | 1.48 | 1.66 | 1.35 | 1.17 | | .27 | 0.16 |
| HADS-A | 5.97 | 3.18 | 8.48 | 2.91 | 4.63* | | .01 | 0.65 |
| HADS-D | 4.80 | 3.66 | 7.44 | 3.67 | 5.12* | | .01 | 0.72 |
| PCS | 43.67 | 5.27 | 38.17 | 4.83 | 6.93* | | .02 | 0.98 |
| MCS | 43.31 | 5.44 | 38.61 | 4.35 | 6.71* | | .02 | 0.95 |
| | $N$ | % | $N$ | % | | $\chi^2$ | $p$ | $d$ |
| SSD | 31 | 28.2% | 24 | 25.8% | | 0.14 | .71 | 0.06 |
| DCPR-$R$ > 0 [a] | 68 | 61.8% | 90 | 96.8% | | 35.69* | < .001 | 1.58 |
| DCPR-$R$ > 1 [b] | 29 | 26.4% | 66 | 71.0% | | 40.27* | < .001 | 1.20 |
| Alexithymia | 36 | 32.7% | 59 | 63.4% | | 19.09* | < .001 | 0.77 |
| Persistent Somatization | 26 | 23.6% | 43 | 46.2% | | 11.45* | .001 | 0.60 |
| Demoralization | 38 | 34.5% | 27 | 29.0% | | 0.70 | .40 | 0.17 |
| Allostatic Load | 22 | 20.0% | 18 | 19.4% | | 0.13 | .91 | 0.04 |

IBS = Irritable Bowel Syndrome; IBS-SSS = IBS Severity Scoring System; FGID = Functional Gastrointestinal Disorders; PHQ-12 = 12-item Patient Health Questionnaire; WI-7 = 7-item Whiteley Index; HADS = Hospital Anxiety (A) and Depression (D) Scale; PCS = Physical Component Summary and MCS = Mental Component Summary of the Short Form-12 Health Survey (SF-12) scale; SSD = Somatic Symptom Disorder; DCPR-R = Diagnostic Criteria for Psychosomatic Research-Revised.

[a] At least one DCPR-R syndrome within the stratum of prevalence > 20%.

[b] More than one DCPR-R syndromes within the stratum of prevalence > 20%.

* Indicates statistical significance ($p$ < .05).

**Table 3**
Hierarchical regression models predicting IBS severity (IBS-SSS) from most prevalent DCPR-R (upper section), alexithymia (middle section), persistent somatization (lower section), SSD, sociodemographic variables, and psychological factors.

| Blocks | Factors | $R^2$ | $\Delta R^2$ | $\Delta F$ | $p$ | $df$ | $B$ | $p$ | Semipartial r |
|---|---|---|---|---|---|---|---|---|---|
| 1 | DCPR-R[a] | 0.184 | | 45.401 | < 0.001 | 1201 | 0.327* | < .001 | 0.37 |
| 2 | SSD | 0.185 | 0.001 | 0.108 | 0.74 | 1200 | 0.004 | .94 | 0.01 |
| 3 | Age | 0.368 | 0.209 | 11.122 | < 0.001 | 6194 | 0.078 | .21 | 0.09 |
| | Gender | | | | | | 0.003 | .96 | 0.01 |
| | HADS-A | | | | | | 0.233* | .02 | 0.17 |
| | HADS-D | | | | | | 0.138 | .16 | 0.10 |
| | PCS[b] | | | | | | −0.165 | .12 | −0.11 |
| | MCS[b] | | | | | | −0.332* | .005 | −0.20 |
| 1 | Alexithymia | 0.095 | | 11.451 | 0.001 | 1201 | 0.191* | .003 | 0.22 |
| 2 | SSD | 0.096 | 0.001 | 0.492 | 0.48 | 1200 | 0.010 | .87 | 0.01 |
| 3 | Age | 0.327 | 0.231 | 13.039 | < 0.001 | 6194 | 0.118 | .08 | 0.12 |
| | Gender | | | | | | 0.016 | .81 | 0.17 |
| | HADS-A | | | | | | 0.276* | .008 | 0.19 |
| | HADS-D | | | | | | 0.208* | .04 | 0.15 |
| | PCS[b] | | | | | | −0.202 | .07 | −0.13 |
| | MCS[b] | | | | | | −0.309* | .01 | −0.18 |
| 1 | Persistent Somatization | 0.061 | | 12.977 | < 0.001 | 1201 | 0.157* | < .001 | 0.18 |
| 2 | SSD | 0.063 | 0.002 | 0.402 | 0.53 | 1200 | 0.007 | .90 | 0.09 |
| 3 | Age | 0.319 | 0.291 | 12.174 | < 0.001 | 6194 | 0.116 | .08 | 0.12 |
| | Gender | | | | | | 0.002 | .97 | 0.01 |
| | HADS-A | | | | | | 0.268* | .01 | 0.18 |
| | HADS-D | | | | | | 0.203 | .05 | 0.14 |
| | PCS[b] | | | | | | −0.178 | .11 | −0.11 |
| | MCS[b] | | | | | | −0.330* | .009 | −0.19 |

DCPR-R = Diagnostic Criteria for Psychosomatic Research-Revised; SSD = Somatic Symptom Disorder; HADS = Hospital Anxiety (A) and Depression (D) Scale; PCS = Physical Component Summary and MCS = Mental Component Summary of the Short Form-12 Health Survey (SF-12) scale.

[a] At least one of the 4 most prevalent (> 20%) DCPR-R syndromes (alexithymia, persistent somatization, demoralization, and allostatic load).

[b] Scores are to be interpreted in the inverted direction with higher scores indicating better functioning.

* Indicates statistical significance ($p < .05$).

**Table 4**
IBS-SSS score (IBS severity) predicted by DCPR-R syndromes and SSD diagnosis.

| | | $n$ | IBS-SSS score | | Effect size ($d$) |
|---|---|---|---|---|---|
| DCPR-R | SSD | | Mean | SD | |
| No | No | 31 | 221.45 | 42.88 | – |
| No | Yes | 14 | 226.79 | 39.88 | – |
| Yes | No | 117 | 310.51 | 82.36 | 1.18 |
| Yes | Yes | 41 | 303.66 | 81.13 | 1.07 |
| Alexithymia | SSD | | | | |
| No | No | 80 | 269.69 | 83.48 | – |
| No | Yes | 28 | 257.50 | 72.79 | – |
| Yes | No | 68 | 317.94 | 78.16 | 0.60 |
| Yes | Yes | 27 | 294.93 | 77.98 | 0.50 |
| Persistent somatization | SSD | | | | |
| No | No | 98 | 276.07 | 82.50 | – |
| No | Yes | 36 | 272.50 | 79.25 | – |
| Yes | No | 50 | 322.80 | 79.00 | 0.58 |
| Yes | Yes | 19 | 306.05 | 78.82 | 0.43 |

DCPR-R = Diagnostic Criteria for Psychosomatic Research-Revised; SSD = Somatic Symptom Disorder.

*Note:* Patients have been stratified by the presence (Yes) or absence (No) of combined DCPR-R and SSD (first two columns) and their frequency is indicated in the third column. In each stratum (rows), effect size was calculated as the difference in means between participants with and without SSD and DCPR-R divided by the pooled standard deviation (sixth column). The first column indicates presence or absence of at least one of the most prevalent (> 20%) DCPR-R syndromes (alexithymia, persistent somatization, demoralization, and allostatic load) (upper section), DCPR-R Alexithymia (middle section), and DCPR-R Persistent Somatization (lower section).

In this study, IBS severity was closely associated with psychological problems and patients diagnosed with the most frequent DCPR-R syndromes (77.8%) were 3 times more prevalent than those diagnosed with SSD (27.1%). Each DCPR-R category showed about the same (allostatic load, 19.7%) or a higher rate (alexithymia, 46.8%; persistent somatization, 34%; and demoralization, 32%) of SSD. However, the main finding of this study has identified psychosomatic syndromes (particularly, alexithymia and persistent somatization) as better predictors of somatic symptoms severity than SSD, after controlling for co-variables.

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [16] estimates the prevalence of SSD at 5%–7% of the general population and these figures may be higher in specialty medical settings. Unfortunately, no reliable epidemiological data on SSD are available at this time and prevalence rates found in different studies are difficult to compare due to the heterogeneity of samples, health care settings, and operational variables used for SSD criteria. Nonetheless, our prevalence of 27% is in line with the still sparse findings in the literature (e.g., [26,46–49]), showing that the overall prevalence of SSD might be 5- to 10-fold higher in clinical samples than in the general population [50]. Moreover, our results are consistent with other investigations that found a similar higher DCPR-to-SSD proportion (3 to 1) and a significant association of DCPR syndromes with psychological distress, health anxiety and somatization in heterogeneous medical settings [19,50–54].

The DCPR-R syndromes are conceived as a proxy of the trans-diagnostic construct of illness behavior and aim to evaluate the perception of somatic sensations, healthcare use, and to assess the origins of symptoms. Additionally, in case of patients sharing the same diagnosis, they are sufficiently multifaceted to assess the deceptively similar patients [4,20]. Our findings show that only DCPR-R syndromes, but not SSD, were associated with the subjective evaluation of symptom severity, suggesting that they may be reliably used to identify the cognitive and affective determinants underlying the individual process of self-assessed health status. In particular, alexithymia and persistent somatization were the two DCPR-R syndromes that independently predicted significant added variance in IBS severity, after controlling for the role of psychological problems. The relevance of alexithymia and persistent somatization in predicting IBS severity is consistent with a large body of literature. Alexithymia is highly prevalent in IBS and other FGID (up to 66%) and co-occurs with somatizing and distressing syndromes [14,55]. Conversely, a stable somatization factor has been

repeatedly shown to explain severity and persistence of GI and non-GI symptoms in IBS patients [9,56,57].

The associated features of alexithymia and persistent somatization in IBS may be explained by several potential factors. Alexithymic characteristics may foster the tendency to amplify and misinterpret the somatic sensations that co-occur with the states of emotional arousal, thus reinforcing the proneness to experience more severe functional somatic symptoms [58]. Moreover, alexithymic features may influence patients' referral to medical rather than to psychiatric care settings because of their difficulty to express and communicate psychological distress [59]. Finally, IBS alexithymic patients show high negative treatment outcomes, suggesting enhanced chronic sensitivity to somatic stimuli that are more refractory to medical and psychological treatment [60,61].

Several limitations are to be noticed in this study. First, we used PHQ-12 and WI-7 as proxy indicators of criteria A and B, respectively. Although suggested and used in previous investigations [32,33], this strategy has some major limitations. The PHQ-12 does not include GI symptoms and was used to avoid overestimation of SSD. Nonetheless, for meeting criterion A, at least one bothersome somatic symptom is to be present, regardless of the fact that some symptoms are typically present in specific medical disorders. Also, the WI-7 assesses only one of the three B criteria (i.e., sub-criterion B-2: persistently high level of anxiety about health or symptoms) required for SSD diagnosis, leaving out sub-criteria B-1 (disproportionate and persistent thoughts about the seriousness of one's symptoms) and B-3 (excessive time and energy devoted to these symptoms or health concerns). Structured interview (e.g., SCID-V [62]) and more specific self-report questionnaires (e.g., SSD-12 [63]) have been published in recent years but were unavailable at the time of the study, thus the prevalence of SSD was maybe underestimated. Nevertheless, when replacing SSD with the two separate variables PHQ-12 and WI-7 in the regression analyses the overall results did not change. Second, DCPR-R syndromes were assessed with an interview whereas SSD with self-report scales. The two methods are complementary and could not be directly compared to each other. Interviews and self-report questionnaires are based on very different psychological processes and are characterized by divergent method variance [64]. Future studies should assess both DCPR-R and SSD by using instruments with comparable shared variance and a multimethod assessment procedure. Third, the cross-sectional design does not allow addressing causality. DCPR-R may contribute to IBS severity or vice versa and longitudinal studies are needed for addressing direction of causality. Fourth, in this study relevant biological data as low-grade inflammation, immune modulation, or altered microbiota as well as the full range of psychopathology were not controlled for and should be taken into account in future investigations. Finally, our sample of moderate-to-severe IBS patients was recruited from a tertiary care clinic and may represent the most severe end of the IBS severity continuum, and should be therefore replicated in larger samples.

With these limitations in mind, this study encourages clinicians to adopt an integrative approach in the assessment of symptom severity by combining specific psychosomatic criteria together with the evaluation of psychological and psychiatric factors. This seems particularly true for patients with functional disorders associated with multiple underlying pathophysiological mechanisms as IBS [65]. Treatment efficacy in IBS may likely depend on subgrouping patients based on shared psychosomatic characteristics rather than the illness per se [66]. The assessment of psychosomatic syndromes may help to identify psychological characteristics (e.g., alexithymia) that are more significantly involved in experiencing symptom severity and that may lead to a vicious circle of health anxiety and chronic somatization.

## Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Declaration of competing interest

None.

## Acknowledgements

The authors thank Dr.Marzia Iasenza for her help in the English translation.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.genhosppsych.2020.03.004.

## References

[1] Barron JW, editor. Making diagnosis meaningful. Washington, DC: American Psychological Association; 1998.
[2] Fava GA. Clinical judgment in psychiatry. Requiem or reveille? Nord J Psychiatry 2013;67:1–10. https://doi.org/10.3109/08039488.2012.701665.
[3] Macneil CA, Hasty MK, Conus P, Berk M. Is diagnosis enough to guide interventions in mental health? Using case formulation in clinical practice. BMC Med 2012;10:111. https://doi.org/10.1186/1741-7015-10-111.
[4] Sirri L, Fava GA. Diagnostic criteria for psychosomatic research and somatic symptom disorders. Int Rev Psychiatry 2013;25:19–30. https://doi.org/10.3109/09540261.2012.
[5] Lovell RM, Ford AC. Global prevalence of and risk factors for irritable bowel syndrome: a meta-analysis. Clin Gastroenterol Hepatol 2012;10:712–21. https://doi.org/10.1016/j.cgh.2012.02.029.
[6] Grundmann O, Yoon SL. Irritable bowel syndrome: epidemiology, diagnosis and treatment: an update for health-care practitioners. J Gastroenterol Hepatol 2011;25:691–9. https://doi.org/10.1111/j.1440-1746.2009.06120.x.
[7] Barbara G, Feinle-Bisset C, Ghoshal UC, Santos J, Vanner SJ, Vergnolle N, et al. The intestinal microenvironment and functional gastrointestinal disorders. Gastroenterology 2016;150:1305–18. https://doi.org/10.1053/j.gastro.2016.02.028.
[8] Mayer EA, Labus J, Aziz Q, Tracey I, Kilpatrick L, Elsenbruch S, et al. Role of brain imaging in disorders of brain-gut interaction: a Rome Working Team Report. Gut 2019. https://doi.org/10.1136/gutjnl-2019-318308. (in press).
[9] Clevers E, Vaes B, Henrard S, Goderis G, Tack J, Törnblom H, et al. Health problems associated with irritable bowel syndrome: analysis of a primary care registry. Aliment Pharmacol Ther 2018;47:1349–57. https://doi.org/10.1111/apt.14612.
[10] Hausteiner-Wiehle C, Henningsen P. Irritable bowel syndrome: relations with functional, mental, and somatoform disorders. World J Gastroenterol 2014;20:6024–30. https://doi.org/10.3748/wjg.v20.i20.6024.
[11] Zamani M, Alizadeh-Tabari S, Zamani V. Systematic review with meta-analysis: the prevalence of anxiety and depression in patients with irritable bowel syndrome. Aliment Pharmacol Ther 2019;50:132–43. https://doi.org/10.1111/apt.15325.
[12] van Oudenhove L, Levy RL, Crowell MD, Drossman DA, Halpert AD, Keefer L, et al. Biopsychosocial aspects of functional gastrointestinal disorders: how central and environmental processes contribute to the development and expression of functional gastrointestinal disorders. Gastroenterology 2016;150:1355–67. https://doi.org/10.1053/j.gastro.2016.02.027.
[13] Schauer B, Grabe HJ, Ittermann T, Lerch MM, Weiss FU, Mönnikes H, et al. Irritable bowel syndrome, mental health, and quality of life: data from a population-based survey in Germany (SHIP-Trend-0). Neurogastroenterol Motil 2019;31(3):e13511https://doi.org/10.1111/nmo.13511.
[14] Carrozzino D, Porcelli P. Alexithymia in gastroenterology and hepatology: a systematic review. Front Psychol 2018;9:470. https://doi.org/10.3389/fpsyg.2018.00470.
[15] Longstreth GF, Hawkey CJ, Mayer EA, Jones RH, Naesdal J, Wilson IK, et al. Characteristics of patients with irritable bowel syndrome recruited from three sources: implications for clinical trials. Aliment Pharmacol Ther 2001;15:959–64. https://doi.org/10.1046/j.1365-2036.2001.01010.x.
[16] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington, DC: American Psychiatric Association Publishing; 2013.
[17] Schröder A, Fink P. The proposed diagnosis of somatic symptom disorders in DSM-V: two steps forward and one step backward? J Psychosom Res 2010;68:95–6. https://doi.org/10.1016/j.jpsychores.2009.06.013.
[18] Sirri L, Fava GA, Sonino N. The unifying concept of illness behavior. Psychother Psychosom 2013;82:74–81. https://doi.org/10.1159/000343508.
[19] Porcelli P, Guidi J. The clinical utility of the Diagnostic Criteria for Psychosomatic Research (DCPR): a review of studies. Psychother Psychosom 2015;84:265–72. https://doi.org/10.1159/000430788.
[20] Cosci F, Fava GA. The clinical inadequacy of the DSM-5 classification of somatic symptom and related disorders: an alternative trans-diagnostic model. CNS Spectr 2016;21:310–7. https://doi.org/10.1017/S1092852915000760.
[21] Hahn SR, Kroenke K, Spitzer RL, Brody D, Williams JBW, Linzer M, et al. The difficult patient: prevalence, psychopathology, and functional impairment. J Gen Intern Med 1996;11:1–8. https://doi.org/10.1007/bf02603477.
[22] Berens S, Schaefert R, Baumeister D, Gauss A, Eich W, Tesarz J. Does symptom

activity explain psychological differences in patients with irritable bowel syndrome and inflammatory bowel disease? Results from a multi-center cross-sectional study. J Psychosom Res 2019;126:109836.
[23] Drossman DA, Hasler WL. Rome IV. Functional GI disorders: disorders of gut-brain interaction. Gastroenterology 2016;50:1257–61. https://doi.org/10.1053/j.gastro.2016.03.035.
[24] Drossman DA, Corazziari E, Delvaux M, Spiller RC, Talley N, Grant Thompson W, editors. Rome III: The functional gastrointestinal disorders – diagnosis, pathophysiology and treatment: a multinational consensus. McLean, VA: Dragon Associates; 2006.
[25] Rief W, Martin A. How to use the new DSM-5 somatic symptom disorder diagnosis in research and practice: a critical evaluation and a proposal for modifications. Annu Rev Clin Psychol 2014;10:339–67. https://doi.org/10.1146/annurev-clinpsy-032813-153745.
[26] Xiong N, Zhang Y, Wei J, Leonhart R, Fritzsche K, Mewes R, et al. Operationalization of diagnostic criteria of DSM-5 somatic symptom disorders. BMC Psychiatry 2017;17:361. https://doi.org/10.1186/s12888-017-1526-5.
[27] Kroenke K, Spitzer RL, Williams JBW. The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. Psychosom Med 2002;64:258–66.
[28] Spiller RC, Humes DJ, Campbell E, Hastings M, Neal KR, Dukes GE, et al. The Patient Health Questionnaire 12 Somatic Symptom scale as a predictor of symptom severity and consulting behaviour in patients with irritable bowel syndrome and symptomatic diverticular disease. Aliment Pharmacol Ther 2010;32:811–20. https://doi.org/10.1111/j.1365-2036.2010.04402.x.
[29] Pilowsky I. Dimensions of hypochondriasis. Br J Psychiatry 1967;113:89–93. https://doi.org/10.1192/bjp.113.494.89.
[30] Fink P, Ewald H, Jensen J, Sorensen L, Engberg M, Holm M, et al. Screening for somatization and hypochondriasis in primary care and neurological in-patients: a seven-item scale for hypochondriasis and somatization. J Psychosom Res 1999;46:261–73. https://doi.org/10.1016/S0022-3999(98)00092-0.
[31] Conradt M, Cavanagh M, Franklin J, Rief W. Dimensionality of the Whiteley Index: assessment of hypochondriasis in an Australian sample of primary care patients. J Psychosom Res 2006;60:137–43. https://doi.org/10.1016/j.jpsychores.2005.07.003.
[32] Rief W, Mewes R, Martin A, Glaesmer H, Brähler E. Evaluating new proposals for the psychiatric classification of patients with multiple somatic symptoms. Psychosom Med 2011;73:760–8. https://doi.org/10.1097/PSY.0b013e318234eff6.
[33] Laferton JAC, Stenzel NM, Rief W, Klaus K, Brähler E, Mewes R. Screening for DSM-5 somatic symptom disorder: diagnostic accuracy of self-report measures within a population sample. Psychosom Med 2017;79:974–81. https://doi.org/10.1097/PSY.0000000000000530.
[34] Francis CY, Morris J, Whorwell PJ. The irritable bowel syndrome severity scoring system: a simple method of monitoring irritable bowel syndrome and its progress. Aliment Pharmacol Ther 1997;11:395–402. https://doi.org/10.1046/j.1365-2036.1997.142318000.x.
[35] Spiegel B, Bolus R, Harris LA, Lucak S, Naliboff B, Esrailian E, et al. Measuring irritable bowel syndrome patient-reported outcomes with an abdominal pain numeric rating scale. Aliment Pharmacol Ther 2009;30:1159–70. https://doi.org/10.1111/j.1365-2036.2009.04144.x.
[36] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361–70. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x.
[37] Norton S, Cosco T, Doyle F, Done J, Sacker A. The hospital anxiety and depression scale: a meta confirmatory factor analysis. J PsychosomRes 2013;74:74–81. https://doi.org/10.1016/j.jpsychores.2012.
[38] Gandek B, Ware JE, Aaronson NK, Apolone G, Bjorner JB, Brazier JE, et al. Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. J Clin Epidemiol 1998;51:1171–8. https://doi.org/10.1016/S0895-4356(98)00109-7.
[39] Melville MR, Lari MA, Brown N, Young T, Gray D. Quality of life assessment using the Short Form 12 questionnaire is as reliable and sensitive as the Short Form 36 in distinguishing symptom severity in myocardial infarction survivors. Heart 2003;89:1445–6. https://doi.org/10.1136/heart.89.12.1445.
[40] Andriopoulos P, Lotti-Lykousa M, Pappa E, Papadopoulos AA, Niakas D. Depression, quality of life and primary care: a crosssectional study. J Epidem Glob Health 2013;3:245–52. https://doi.org/10.1016/j.jegh.2013.06.004.
[41] Rawal S, Atia M, Nisenbaum R, Paré DE, Joorden S, Hwang SW. Is “appearing chronically ill” a sign of poor health? A study of diagnostic accuracy. PLoS One 2013;8:e79934https://doi.org/10.1371/journal.pone.0079934.
[42] Cohen J. Statistical power for the behavioral sciences. 2nd ed. Hillsdale: Erlbaum; 1988.
[43] Henningsen P. Management of somatic symptom disorder. Dialogues Clin Neurosci 2018;20:23–31.
[44] Fava GA, Cosci F, Sonino N. Current psychosomatic practice. Psychother Psychosom 2017;86:13–30. https://doi.org/10.1159/000448856.
[45] Drossman DA, Chang L, Bellamy N, Gallo-Torres HE, Lembo A, Mearin F, et al. Severity in irritable bowel syndrome: a Rome Foundation Working Team report. Am J Gastroenterol 2011;106:1749–59. https://doi.org/10.1038/ajg.2011.201.
[46] Häuser W, Bialas P, Welsch K, Wolfe F. Construct validity and clinical utility of current research criteria of DSM-5 somatic symptom disorder diagnosis in patients with fibromyalgia syndrome. J Psychosom Res 2015;78:546–52. https://doi.org/10.1016/j.jpsychores.2015.03.151.
[47] Limburg K, Sattel H, Dinkel A, Radziej K, Becker-Bense S, Lahmann C. Course and predictors of DSM-5 somatic symptom disorder in patients with vertigo and dizziness symptoms – a longitudinal study. Compr Psychiatry 2017;77:1–11. https://doi.org/10.1016/j.comppsych.2017.05.003.
[48] Claassen-van Dessel N, van der Wouden JC, Dekker J, van der Horst HE. Clinical value of DSM IV and DSM 5 criteria for diagnosing the most prevalent somatoform disorders in patients with medically unexplained physical symptoms (MUPS). J Psychosom Res 2016;82:4–10. https://doi.org/10.1016/j.jpsychores.2016.01.004.
[49] Vogt K, Wollburg E, Weinmann N, Herzog A, Meyer B, Langs G, et al. Predictive validity and clinical utility of DSM-5 somatic symptom disorder – comparison with DSM-IV somatoform disorders and additional criteria for consideration. J Psychosom Res 2012;73:345–50. https://doi.org/10.1016/j.jpsychores.2012.08.020.
[50] Ross CA. Problems with DSM-5 somatic symptom disorder. J Trauma Dissociation 2015;16:341–8. https://doi.org/10.1080/15299732.2014.989558.
[51] Porcelli P, Sonino N. Psychological factors affecting medical conditions. A new classification for DSM-V. Basel: Karger; 2007.
[52] Guidi J, Rafanelli C, Roncuzzi R, Sirri L, Fava GA. Assessing psychological factors affecting medical conditions: comparison between different proposals. Gen Hosp Psychiatry 2013;35:141–6. https://doi.org/10.1016/j.genhosppsych.2012.09.007.
[53] Huang WL, Liao SC. Subgrouping somatic symptom disorder: an analysis based on the diagnostic criteria for psychosomatic research. Psychother Psychosom 2018;87:316–8. https://doi.org/10.1159/000492227.
[54] Piolanti A, Gostoli S, Gervasi J, Sonino N, Guidi J. A trial integrating different methods to assess psychosocial problems in primary care. Psychother Psychosom 2019;88:30–6. https://doi.org/10.1159/000496477.
[55] Porcelli P, Guidi J, Sirri L, Grandi S, Grassi L, Ottolini F, et al. Alexithymia in the medically ill. Analysis of 1190 patients in gastroenterology, cardiology, oncology and dermatology. Gen Hosp Psychiatry 2013;35:521–7. https://doi.org/10.1016/j.genhosppsych.2013.04.005.
[56] Patel P, Bercik P, Morgan DG, Bolino C, Pintos-Sanchez MI, Moayyedi P, et al. Irritable bowel syndrome is significantly associated with somatisation in 840 patients, which may drive bloating. Aliment Pharmacol Ther 2015;41:449–58. https://doi.org/10.1111/apt.13074.
[57] Kim SE, Chang L. Overlap between functional GI disorders and other functional syndromes: what are the underlying mechanisms? Neurogastroenterol Motil 2012;24:895–913. https://doi.org/10.1111/j.1365-2982.2012.01993.x.
[58] Porcelli P, Taylor GJ. Alexithymia and physical illness: a psychosomatic approach. In: Luminet O, Bagby RM, Taylor GJ, editors. Alexithymia. Advances in research, theory, and clinical practice. Cambridge, UK: Cambridge University Press; 2018. p. 105–26.
[59] Porcelli P, Affatati V, Bellomo A, De Carne M, Todarello O, Taylor GJ. Alexithymia and psychopathology in patients with psychiatric and functional gastrointestinal disorders. Psychother Psychosom 2004;73:84–91. https://doi.org/10.1159/000075539.
[60] Porcelli P, Bagby RM, Taylor GJ, De Carne M, Leandro G, Todarello O. Alexithymia as predictor of treatment outcome in patients with functional gastrointestinal disorders. Psychosom Med 2003;65:911–8. https://doi.org/10.1097/01.PSY.0000089064.13681.3.
[61] Porcelli P, De Carne M, Leandro G. The role of alexithymia and gastrointestinal-specific anxiety as predictors of treatment outcome in irritable bowel syndrome. Compr Psychiatry 2017;73:127–35. https://doi.org/10.1016/j.comppsych.2016.11.010.
[62] First MB, Williams JBW, Karg RS, Spitzer RL. User’s guide for the structured clinical interview for DSM-5 (R) disorders — clinician version (SCID-5-CV). Washington, DC: APA; 2016.
[63] Toussaint A, Murray AM, Voigt K, Herzog A, Gierk B, Kroenke K, et al. Development and validation of the somatic symptom disorder-B criteria scale (SSD-12). Psychosom Med 2016;78:5–12. https://doi.org/10.1097/PSY.0000000000000240.
[64] Bornstein RF. Evidence-based psychological assessment. J Pers Assess 2017;4:435–45. https://doi.org/10.1080/00223891.2016.1236343.
[65] Simrén M, Törnblom, Palsson OS, Van Oudenhove L, Whitehead WE, Tack J. Cumulative effects of psychologic distress, visceral hypersensitivity, and abnormal transit on patient-reported outcomes in irritable bowel syndrome. Gastroenterology 2019;157:391–402. https://doi.org/10.1053/j.gastro.2019.04.019.
[66] Simrén M, Tack J. New treatments and therapeutic targets for IBS and other functional bowel disorders. Nat Rev Gastroenterol Hepatol 2017;2:112–22. https://doi.org/10.1038/s41575-018-0034-5.