

REVIEW ARTICLE

Assessment of somatoform disorders: a review of strategies and instruments

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We provide an overview of methods and instruments developed for the assessment of somatoform disorders. Four diagnostic purposes have been identified: (i) classification according to a diagnostic system; (ii) screening for probable cases; (iii) dimensional measurement of syndrome severity; and (iv) assessment of associated clinical features. Existing instruments designed for each of these strategies are described, including specifications of their psychometric properties, particular features, advantages and disadvantages. A conclusion of this review is that the currently existing 'family of assessment instruments' in the field of somatoform disorders should be used to improve the comparability of scientific findings in different cultures and settings.

Keywords: assessment; instruments; diagnostic methods; classification; somatoform disorders; hypochondriasis

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Introduction

The somatoform disorders (SFDs) represent a circumscribed group of mental disorders characterized by multiple and medically unexplained somatic symptoms. Although the presentation of these symptoms may be different across cultures, the concept of SFDs has become well accepted among scientists and clinicians all over the world. It was first introduced by the third *Diagnostic and Statistical Manual of Mental Disorders* (1), not as a specific diagnostic category but as a broad 'umbrella' term covering various clinical conditions such as somatization disorder, conversion disorder, pain disorder and hypochondriasis (see Table 1). The common and most prominent diagnostic features are somatic symptoms without medical explanation and/or excessive health anxieties. The current classification systems, DSM-IV (2) and ICD-10 (3), have continued to use definitions very similar to those originally introduced in DSM-III. Due to this common origin, the diagnostic frameworks for SFDs in DSM-IV and ICD-10 are nearly identical and a broad international consensus on the classification of SFDs has been established. Another reason for the similarity between DSM-IV and ICD-10 is related to the fact that both classifications are primarily descriptive and non-etiological.

As a distinct group of disorders, the SFDs have also stimulated the development of numerous assessment tools and instruments suitable for use in research and/or clinical settings. Researchers in different countries proposed self- or observer-rated procedures which can be used to identify somatoform patients, describe their clinical features or measure changes over time. Some instruments were thoroughly evaluated using psychometric and statistical methods. A number of those with good psychometric quality were consequently used in different studies and thus facilitated comparisons across cultures and settings. Some instruments were published together with training manuals and are nowadays routinely used in everyday clinical practice.

This paper represents an attempt to provide an overview of most thoroughly evaluated and widely used assessment instruments in the field of the SFDs. For this purpose, an extensive review of the international literature since the introduction of the SFD concept in 1980 was undertaken.

Diagnostic purposes

The instruments available for SFDs are not a homogeneous group. They differ according to their main diagnostic purpose of assessment.

Table 1. Categories of somatoform disorders in DSM-IV and ICD-10

DSM-IV	ICD-10
Somatization Disorder	Somatization Disorder
Undifferentiated Somatoform Disorder	Undifferentiated Somatoform Disorder
—	Somatoform Autonomic Dysfunction
Pain Disorder	Persistent Somatoform Pain Disorder
Conversion Disorder	[Conversion Disorder] ^a
Hypochondriasis	Hypochondriacal Disorder
Body Dysmorphic Disorder	— ^b
Somatoform Disorder Not Otherwise Specified (NOS)	Other/ Unspecified Somatoform Disorder

^a in ICD-10 part of the chapter "Dissociative and Conversion Disorders" (F44).

^b in ICD-10 not defined as a distinct disorder but subtype of Hypochondriacal Disorder (F45.2).

Therefore we will first describe some major goals which usually underlie clinical investigations.

Diagnostic classification and case identification

The decision as to whether a person fulfills or doesn't fulfill the criteria of a SFD is probably the most important goal of diagnostic assessment. There is broad agreement that mere self-descriptions by the patients are not sufficient for making such a diagnostic decision, but rather experts' ratings are required. A number of approaches using structured interview guidelines or checklists have been developed for this purpose. Because of the complex and structured format of such instruments, diagnosticians usually have to receive systematic training before reliable and valid diagnoses can be made.

Screening for possible cases

If larger community or clinical populations are studied, it may be valuable to use self-rating instruments which aim to indicate whether or not a SFD is potentially present. Although these instruments are not considered precise enough to make a final diagnostic decision about the presence of a specific SFD, they are efficient in identifying subgroups which are likely to be diagnosed with such a disorder during subsequent expert-rated interviews. It is important to note that such screening methods are also used to identify potentially 'negative cases', i.e. the persons in whom a SFD can most likely be ruled out.

Quantification of somatoform symptomatology and health anxieties

The diagnostic systems DSM-IV and ICD-10 are restricted to categorical yes–no decisions. Nevertheless, as patient groups with the same diagnosis may be rather heterogeneous with regard to their subjective and symptom-related distress, additional scales providing information on a syn-

drome continuum of severity may be necessary. Using such scales, the diagnostician can find out whether the disorder is relatively mild, moderate or severe. The same dimensional approach can be used to evaluate changes in symptomatology over time, e.g. before and after treatment.

Assessment of additional features frequently associated with SFDs

The DSM-IV and ICD-10 definitions of the SFDs include only their key features and should not be regarded as completely comprehensive. In many cases it is necessary to consider additional emotional, cognitive, behavioral and psychosocial aspects. For example, one important characteristic of somatoform patients is their tendency to visit numerous doctors and undergo repeated somatic examinations and treatments. This phenomenon is often referred to as illness behavior (4) and needs to be assessed and addressed in almost every patient with SFD. Another aspect which has received much attention in the past involves dysfunctional cognitions such as misinterpretations of bodily symptoms or the biased self-perception of being physically weak and insufficient. It is discussed whether problematic cognitions play a central role in the long-term maintenance of SFDs (5) and such information may be valuable for clinicians when planning the treatments.

Instruments for diagnostic classification

The most commonly used diagnostic interviews are the Structured Clinical Interview for DSM-IV (SCID) (6,7), and the Composite International Diagnostic Interview (CIDI) (8). Both instruments cover all major mental disorders and include a separate section on SFDs. Within this section, the criteria for each individual SFD diagnosis can be evaluated. While the SCID is restricted to DSM-IV, the CIDI polydiagnostically covers DSM-IV as well as ICD-10 categories. Another important difference is that the SCID is a strict expert rating instrument where the interviewer makes diagnostic decisions on the basis of the patients' answers and all other available information (e.g. observations during the interview, third-party information or available previous reports). In contrast, the CIDI is administered in such a way that the patients' answers are probed and scored without applying clinical judgement. Therefore, the CIDI can be used by trained lay interviewers, which is an important methodological prerequisite for conducting large epidemiological studies (9). Following the CIDI format, Janca et al. (10)

have developed the Somatoform Disorders Schedule (SDS) which covers all DSM-IV and ICD-10 categories of SFDs and is more differentiated than the CIDI with respect to the clinical information obtained. The SDS was evaluated during the first phase of a WHO International Study of Somatoform Disorders and found to be a reliable tool for the assessment of SFDs in different cultures and settings (11).

As an alternative approach to diagnostic interviews, Hiller et al. (12,13) developed the International Diagnostic Checklists (IDCL) which exist in separate versions for DSM-IV and ICD-10. These checklists are recommended by the WHO for use in research and everyday patient examinations. The basic IDCL assessment method is very similar to the above-mentioned diagnostic interviews except that the reading of preformulated questions and a forced step-by-step procedure are not necessary. Instead, the diagnostic criteria are listed in a clinically useful order allowing the diagnostician quickly to decide whether or not a suspected diagnosis can be given. The IDCL are to be administered by trained and experienced clinicians. There exists one checklist for all disorders related to somatic symptoms and another one for hypochondriacal disorder.

Psychometric properties of the instruments

Although the reliabilities of the SCID and CIDI have been extensively studied for various mental disorders (14,15), only a few SFD diagnoses were evaluated. The main reason for this can be found in the fact that most reliability studies have been conducted in psychiatric settings where somatizing patients are rare and kappa coefficients (κ) cannot be computed because of low base rates (κ is the most commonly used statistic to express the congruence of two categorical variables; a value of +1.0 indicates perfect congruence while values of $\kappa > 0.50$ are interpreted as acceptable and $\kappa \geq 0.70$ as good) (16). In two German studies, test-retest results for somatization disorder were $\kappa = 0.22$ for the SCID (17) and 0.66 for the CIDI (18). Wittchen (15) summarized several test-retest studies for the CIDI and reported joint κ -values of 0.74 for somatization disorder, 0.68 for pain disorder and 0.71 for hypochondriasis. The test-retest reliability of the SDS was explored in five WHO centers representing the general psychiatry and primary care settings (10) and the results were promising: the overall reliability was 0.76 for all SDS items (intraclass coefficient), 0.59 for the group of pain symptoms and 0.58 for all other

symptom groups. The reliability of checklist-guided diagnoses was generally found to be in the same range as interview-based diagnoses if trained diagnosticians follow the principles of diagnostic operationalization as required by DSM-IV and ICD-10 (19).

The validity of interview-based diagnoses is an unresolved problem because of a lack of agreement on a common standard against which interview results could be tested. Therefore diagnoses made by use of clinical interviews are considered to be a 'gold standard'. However, diagnoses of SFDs derived from lay-administered interviews such as the CIDI should be considered with much caution. Some studies have compared such diagnoses with those made by experienced clinicians for the same patients and found that lay interviewers considerably underestimated SFDs (20–22). The reason was that lay interviewers tended to accept the patients' inaccurate 'medical explanations' for their somatic symptoms because of lack of medical knowledge.

Advantages and disadvantages of the instruments

SCID, CIDI and SDS force the clinician into a structured, standardized and logically clear diagnostic process which assures a high level of consistency. On the other side, these examinations are inflexible, often too long and cumbersome [for critical comments on clinical experiences, see Swartz et al. (23)]. The IDCL allows for more flexibility and the clinician usually gets a more comprehensive overview of how individual criteria are combined in a specific diagnosis. If the checklists are administered by trained diagnosticians, a comparable level of reliability and validity can be expected. In our working groups, we usually train our diagnosticians first to administer the SCID and enable them after five to 10 SCID interviews to proceed in a similar but more flexible way with the IDCL.

Other comparable instruments

The Schedules for Clinical Assessment in Neuropsychiatry (SCAN) (24) is another WHO instrument developed for international use. Unlike the CIDI, the SCAN is a semistructured clinician-administered interview which allows the diagnostician to use his or her own clinical judgements and consider all available information. The SCAN follows the same principles as the SCID but includes ICD-10 as well as DSM-IV diagnoses. It contains a relatively brief section on 'physical

health, somatoform and dissociative disorders' which covers key symptoms of SFDs and provides a set of standard probe questions for the assessment of their clinical significance and the exclusion of organic causes. Another interview approach, the Primary Care Evaluation of Mental Disorders (PRIME-MD) (25,26), was designed as a rapid procedure for diagnosing mental disorders (including SFDs) by primary care physicians. The two components of the PRIME-MD are a one-page questionnaire to be filled out by the patient and a relatively short subsequent interview based on a clinician evaluation guide. Spitzer et al. (25) found a generally good agreement between PRIME-MD diagnoses and those of independent mental health professionals. However, to our knowledge, test-retest results for SFD categories have not been published either for the SCAN or for the PRIME-MD.

Instruments for screening

Because structured and standardized explorations tend to be lengthy and complicated for patients with comorbid patterns of psychopathology, there is a need for simpler screening procedures to establish evidence of a probable somatoform symptomatology. Such screening can be done either by questionnaires or by use of shortened symptom lists which are checked during the exploration.

A screening questionnaire, the Screening for Somatoform Disorders (SOMS), was developed by Rief et al. [27; see also Rief et al. (28)]. The SOMS lists 53 bodily symptoms which respondents have to indicate as having been present or absent during the past 2 years. Only symptoms for which physicians had not been able to find clear organic causes are asked for. The SOMS includes all symptoms specified by the definitions of somatization disorder in DSM-IV and ICD-10 and somatoform autonomic dysfunction in ICD-10. Therefore, the SOMS can indicate whether there is evidence for one of these disorders (or for pain disorder). The questionnaire also includes items directly referring to additional criteria of the classification systems for the above-mentioned disorders, e.g. frequent doctor visits, acceptance of the doctor's negative medical findings, influence of the somatic symptoms on well-being, onset and duration. In addition, there are a few items referring to the definitions of hypochondriacal and body dysmorphic disorder. Thus the SOMS resembles a questionnaire version of the diagnostic criteria for SFDs according to the current classification systems.

Another case-finding approach represent screening indexes. These consist of a relatively small number of symptoms which have to be evaluated during the clinical exploration. Screening indexes were proposed when usual examinations are generally very time-consuming (as for somatization disorder). If a screening index is positive, the presence of the disorder is very likely and the diagnostician is advised to proceed with a more thorough investigation. An example is the Seven Symptom Screening Test, developed by Othmer and DeSouza (29) and based on the 35 somatization disorder symptoms given by DSM-III-R. The presence of three symptoms out of seven highly discriminate symptoms was defined as 'screening positive'. With this criterion, a sensitivity of 73% (correct identification of cases) and a specificity of 94% (correct identification of non-cases) resulted in the diagnosis of somatization disorder. A similar procedure was developed by Swartz et al. (23) who defined a positive screening diagnosis of somatization disorder whenever at least five out of 11 selected somatization symptoms were present. Smith and Brown (30) and Bucholz et al. (31) re-analyzed the proposed screening indexes and found comparable results with 70–80% of correct identifications of somatization disorder cases (depending on the positive screening threshold).

Psychometric properties

The SOMS was thoroughly evaluated and its psychometric properties are well established (27). The 72-h test-retest reliability was 0.85 for the somatization index (number of all symptoms given by DSM-III-R somatization disorder), and even on item level more than 90% of the κ -values were ≥ 0.60 . The internal consistency was 0.88 across all 53 somatic symptoms and 0.70 for the DSM-IV somatization index. This index correlated 0.59 with the SCL-90R Somatization scale and 0.43 with both the Whiteley Index (see below) and the Beck Depression Inventory (BDI). The SOMS also showed high discriminant validity when somatizing patients were compared with a healthy control group from the general population. When diagnoses based on the SOMS findings were compared with those made using the SCID for the same patients, a sensitivity of 82% and a specificity of 85% were found. The SOMS was highly sensitive (98%) and moderately specific (63%) to correctly identify patients with a clinically relevant somatization syndrome [as defined by Escobar's abridged somatization syndrome SSI-4,6; see Escobar et al. (32,33)].

Advantages and disadvantages of the methods

To our knowledge, the SOMS is the only self-rated screening instrument with known sensitivity and specificity for the detection of a SFD. Advantages are that the SOMS is compatible with DSM-IV and ICD-10 and that diagnosticians receive an initial orientation without having to invest time into a face-to-face investigation. However, in cases of a positive screening result, it is advisable to conduct a full clinical investigation in order to confirm or reject the SOMS finding. An advantage of the various clinician-rated screening indexes is that the procedure is clinician-rated from the beginning onwards. In case of a positive screening, only the symptoms not included in the index remain to be further investigated. However, it seems somewhat confusing that competing indexes were proposed using different symptoms and a different number of screening items. Since most of the indexes were developed in psychiatric patient samples, it remains unclear whether they are valid also in other settings such as primary care or specialized tertiary care. Another shortcoming is that the usefulness of the indexes has only been studied for the identification of somatization disorder, and not for other more common and broader somatization syndromes.

Other comparable instruments

Among the available WHO instruments for the assessment of ICD-10 symptoms and disorders, the Somatoform Disorders Symptom Checklist (34,35) was used during the above-mentioned large international and cross-cultural comparison study in the primary care settings. This checklist contains all symptoms characteristic for SFDs according to ICD-10, as well as some additional symptoms of SFDs which are typical for specific cultures (e.g. body odor in Japan, loss of semen in India). The instrument covers 60 bodily symptoms and contains some further operationalizations of ICD-10 diagnostic criteria for SFDs. The instrument exists in several languages including English, Italian, Kannada (India), Portuguese, Russian and Shona (Zimbabwe). Diagnostic precision and reliability, however, have not yet been studied systematically.

Instruments for syndrome severity assessment

As most SFDs are primarily defined through medically unexplained somatic symptoms, various

approaches have been made to develop suitable symptom questionnaires. Such instruments can be used to examine both the type and number of bodily complaints a person has. The results may indicate whether the complaints are polysymptomatic (i.e. from multiple organ systems) or restricted to one type (e.g. only pain symptoms). A somatization syndrome is usually determined by counting the number of somatic symptoms. This number can be interpreted as a general indicator of the severity of the disorder (e.g. 36,37).

One systematically developed symptom questionnaire is the above-described SOMS (27). For the purpose of measuring the severity of a SFD syndrome, it exists in two versions: (i) the SOMS-2, which refers to the time period of the past 2 years and counts each symptom as either present or absent; and (ii) the SOMS-7, which provides a rating of symptom severity on five-point Likert scales for the past 7 days only. Although both versions include the same list of somatic symptoms (all coming from the DSM-IV and ICD-10 descriptions of SFDs), they differ in their main purposes. While the SOMS-2 was mainly developed for rough screening and identification of existing symptoms, the SOMS-7 can also be used to assess severity on the level of single symptoms. The SOMS-7 also enables researchers and clinicians to evaluate changes in the severity of somatoform symptoms between two or more points of measurement in a more accurate way. For example, if a symptom does not entirely disappear during treatment, although the subjectively perceived symptom distress has decreased, the treatment cannot be accurately evaluated by presence-absence measures, only by scales providing a symptom severity scaling.

Symptom severity questionnaires have also been developed by various other research groups. The somatization subscale of the revised Hopkins Symptom Checklist (SCL-90R) (38) is frequently used. It includes 12 symptoms, such as headaches, low back pain, painful muscles, dizziness, pain in the chest or heart region, nausea, breathing difficulties or feelings of bodily weakness. Barsky et al. (39) combined 26 items from the SCL-90R and the Minnesota Multiphasic Personality Inventory (see below) to construct the Somatic Symptom Inventory (SSI). Another scale, simply called the Symptom Questionnaire, was developed by Kellner (40) who included 23 somatic and well-being items together with 69 additional items relating to depression, anxiety and anger-hostility. Mumford et al. (41) introduced the Bradford Somatic Inventory (BSI), which was primarily used in multiethnic studies to compare bodily

complaints of persons in Great Britain and on the Indo-Pakistan subcontinent. The primary goal of the BSI, however, was to assess bodily complaints that are frequently associated with anxiety and depression.

There are other instruments that refer to the symptoms characteristic for hypochondriacal disorder. The most commonly used scales in this area are the Whiteley Index (WI) and the Illness Attitude Scales (IAS). The WI had originally been developed by Pilowsky (42), who attempted to identify and characterize patients perceived as hypochondriacal by the staff of a general hospital. The WI consists of only 14 items which can be used to define the three subscales 'disease conviction', 'somatic preoccupation' and 'disease phobia'. The IAS was developed and evaluated by Kellner (43,44) to describe psychopathology which tends to be associated with hypochondriacal beliefs and attitudes and can be responsible for abnormal illness behavior. The instrument consists of 29 items to be rated on five-point Likert scales. According to new research findings, the IAS can be interpreted by computing two subscales labeled 'health anxiety' and 'illness behavior' (45–47). Normative values for both instruments were evaluated and established in general population studies (47,48). Items of the IAS were also included into the 21-item Health Anxiety Questionnaire (HAQ) (49) which differentiates the four dimensions 'health worry and preoccupation', 'fear of illness and death', 'reassurance-seeking behavior' and 'interference with life'. The HAQ, however, was not explicitly designed to reach compatibility with the clinical concept of hypochondriasis.

A classic instrument attempting to assess both somatic symptoms and health-related characteristics is the Minnesota Multiphasic Personality Inventory (MMPI-2; 50). It has two relevant scales: 'hysteria', measuring a lack of psychological insight and self-awareness along with strong reactions to stress; and 'hypochondriasis', assessing vague and non-specific concerns about body functioning and abnormal preoccupation with illness. Butcher et al. (51) have also suggested interpreting content scales, among which the 'health concerns' scale summarizes a large number of gastrointestinal, neurological, sensory, cardiovascular, skin, pain and respiratory complaints in different regions of the body.

Psychometric properties of the instruments

The SOMS-7 demonstrated a high internal consistency of $\alpha=0.92$ in a recent study of psychosomatic patients who were assessed before and after

treatment (52). The test–retest reliabilities for a 4-month waiting period were 0.76 (symptom count) and 0.71 (severity index). Both indices were highly correlated with the number of somatoform symptoms according to a diagnostic interview. They also discriminated between patients fulfilling the complete criteria for somatization disorder, patients with somatization syndrome and those with other mental disorders. The composite indices as well as most single items confirmed symptom distress improvements when treatment was finished.

Barsky et al. (39) evaluated their frequently used SSI very thoroughly and reported a 1–5 week test–retest reliability of 0.86, an internal consistency of $\alpha=0.95$ and meaningful associations with a variety of other measures of somatization and hypochondriasis. Kellner (40) reported a 4-week test–retest reliability of 0.77 for the 'somatic' subscale of his Symptom Questionnaire, conventional split-half values of 0.57–0.84 and various results demonstrating good validity. The SCL-90R is known to have generally good test–retest reliabilities and internal consistencies for all scales in different populations (38,53). Test–retest values of the MMPI-2 for all basic and content scales are around 0.80 and thus at the upper level of reliability which can be expected for personality inventories (50,51). The psychometric properties of the BSI are, to our knowledge, not known.

Studies conducted in different countries have also confirmed the high level of psychometric quality and clinical usefulness of the hypochondriasis-related questionnaires WI and IAS (e.g. 45, 46, 54–57). In a recent study of our group (47), the 30-day test–retest reliability was 0.92 for the WI and 0.89 for the IAS in a sample of patients on a waiting list for treatment. Cronbach's α values were 0.80 (WI) and 0.90 (IAS). The intercorrelation between the WI and IAS global scores was 0.79, which indicates that both instruments refer to a very similar clinical concept of hypochondriasis. Sensitivity/specificity against the DSM-IV diagnosis of hypochondriacal disorder was 0.71/0.80 for the WI and 0.72/0.79 for the IAS. The validity of both scales has been demonstrated in many other published studies (e.g. 58–60). The authors of the HAQ reported a test–retest reliability of 0.95 in clinical psychology outpatients (time interval 4–7 weeks) and an internal consistency of $\alpha=0.92$ (49).

Advantages and disadvantages of the instruments

The SOMS covers a large number of somatic symptoms and is, unlike the other instruments, directly linked to DSM-IV and ICD-10. It also

has the advantage that patients are instructed to report only symptoms for which no clear organic causes have been found. Therefore the SOMS differentiates better than other scales between somatoform symptoms and those caused by organic disease. The SCL-90R is a very frequently used questionnaire because it is multidimensional and provides a general profile of psychopathological dimensions. Its weakness, however, is that the somatization scale is constituted by only a small number of arbitrarily selected symptoms which do not sufficiently represent the broad spectrum of SFDs. Kellner's Symptom Questionnaire includes psychological complaints such as depression and anxiety but it remains unclear if somatic symptoms measured by this instrument are to be interpreted as 'bodily correlates' of these complaints or as independent from them. Another problem is that somatic symptoms and aspects of well-being are not clearly separated. The strength of the BSI is that it has been evaluated in transcultural comparison studies. The MMPI-2 is probably the most commonly used personality scale worldwide, but its relationship to the current concepts of SFD are rather loose. The 'hysteria' and 'hypochondriasis' subscales are not restricted to core somatic and psychological symptoms but represent a rather heterogeneous combination of personality, cognitive, emotional and somatic problems. This limitation does not exist for the 'health concerns' content scale of the MMPI-2, which has a clear focus on somatic complaints.

For the hypochondriacal dimension, the reliabilities and validities of the WI and IAS seem to be very similar. In practice, the short WI with only 14 items is often preferred. The IAS, on the other hand, includes a number of interesting and relevant aspects of hypochondriacal symptomatology (e.g. repeated self-examination of the body, thanatophobia) as well as an independent estimate of illness behavior.

Instruments to assess associated features of SFDs

Somatosensory amplification

Barsky (61) suggested that somatizing patients tend to be oversensitive towards normal bodily sensations, react with low tolerance to bodily discomfort and interpret symptoms very quickly as evidence of a serious disease. This temporary or enduring disposition, called 'somatosensory amplification', was considered to be an important mechanism in the development of SFDs. Barsky et al. (62) developed the 10-item Somatosensory Amplification Scale

(SSAS) to measure this tendency. Examples of items are 'Even something minor, like an insect bite or splinter, really bothers me' or 'When someone else coughs, it makes me cough too'. The SSAS was used in various studies and high correlations were found with measures of hypochondriasis and somatization (e.g. 45, 54, 58). Hypochondriacal patients were found to have significantly higher SSAS scores than a comparison group of non-hypochondriacal medical patients. The test-retest reliability of the SSAS over a median of 74 days was 0.79 and the internal consistency was $\alpha = 0.82$ (62). The SSAS was significantly associated with DSM-III-R hypochondriasis and predicted the persistence of hypochondriacal symptoms in transiently hypochondriacal patients (63).

Dysfunctional cognitions

Cognitive-behavioral models of SFDs emphasize the role of inadequate body-related interpretations and health-related beliefs (64). It is assumed that somatoform patients have unrealistic attitudes towards health (e.g. 'One is physically healthy only if there are no bodily complaints') or tend to misinterpret benign bodily sensations as threatening signs of disease (e.g. 'Strong heart pounding indicates a severe heart disease'). Such cognitions are also part of Barsky's concept of somatosensory amplification (see above). An instrument designed to assess a broad range of dysfunctional cognitions, the Cognitions About Body and Health Questionnaire (CABAH), was developed by Rief et al. (5). It consists of 31 statements to be answered on four-point Likert scales. Based on factor analytic results, the CABAH comprises the following scales: (i) catastrophizing interpretation of bodily complaints (e.g. 'The most common reason for discomfort is a serious disease'); (ii) autonomic sensations (e.g. 'I often feel my heart beating because my circulatory system is very sensitive'); (iii) bodily weakness (e.g. 'After physical exertion I often have a feeling of being weak'); (iv) intolerance of bodily complaints (e.g. 'If something is wrong with my bodily sensations, it upsets me at once'); (v) health habits (e.g. 'I am always careful to live really healthily'). The internal consistency of the CABAH was $\alpha = 0.90$ in a clinical sample of 493 inpatients and the first four scales were able to discriminate between somatoform and non-somatoform patients (5).

A related instrument, the Health Norms Sorting Task (HNST), was developed by Barsky et al. (65) to study normative beliefs about health and sickness. Patients are instructed to imagine a completely

healthy person developing each of 24 common and ambiguous symptoms (e.g. dry mouth or headache) which are written on cards. These cards have to be sorted into two boxes according to whether the patient considers the imagined person to be 'still healthy' or 'no longer healthy'. The authors reported a test-retest reliability of 0.69 over a mean interval of about 7 months and an internal consistency of $\alpha = 0.88$. The HNST was not related to medical morbidity but to hypochondriasis (65).

Causal attributions for 13 common somatic symptoms can be examined with the Symptom Interpretation Questionnaire (SIQ) (66,67). This instrument differentiates between somatic, emotional and normative causes, and the perceived relevance of each cause for specified somatic symptoms is rated on a Likert scale. According to data reported by Robbins and Kirmayer (66), the internal consistencies for the three scales were between $\alpha = 0.71$ and 0.86. Medical and psychiatric history differentially influenced attributional style which again was associated with modes of clinical presentation.

Illness behavior

Patients with SFDs often attribute their symptoms to organic causes. Therefore they seek medical help and tend to develop behaviors which are similar to those in organically ill patients. They also tend to disbelieve their doctors when told that no pathological results were found and continue to search for 'better' doctors and specialists. A new systematic approach to assess illness behavior was recently described by Rief et al. (68). Their instrument, the Scale for the Assessment of Illness Behavior (SAIB), includes 26 items which constitute five dimensions: (i) verification of diagnoses (e.g. 'Concerning my diagnosis, I always ask for a second medical opinion'); (ii) expression of symptoms (e.g. 'Everybody can see when I am suffering'); (iii) medication (e.g. 'I always have the most important medicines at home'); (iv) consequences of illness (e.g. 'Illnesses influence the way I act towards my family and my friends'); and (v) scanning (e.g. 'When having complaints I very attentively watch the afflicted body part'). Internal consistency for the complete scale was $\alpha = 0.87$ and a comparison with doctor's ratings for aspects of illness behavior revealed expected relationships. The authors found elevated scores on all factors in patients with somatization syndrome and major depression as compared with healthy controls (68).

A classic instrument designed to measure abnormal illness behavior is the Illness Behavior Questionnaire (IBQ) (69,70). It includes the 14 WI items (see above) plus 48 items relating to illness attitudes and concerns. Although the IBQ was shown to be adequately reliable, it is only loosely connected with modern formulations of SFDs (64) and there have been concerns about its validity (71). The above-described 'illness behavior' scale of the IAS (46) is comparatively narrow because it includes only items describing health care utilization and symptom-related functional impairments.

Multiple SFD-related clinical features

Noyes et al. (72) attempted to measure several associated features of somatization in only one questionnaire. They constructed the 27-item Health Attitude Survey for which the following scale structure was determined: (i) dissatisfaction with care (e.g. 'Doctors do not seem to know much about the health problems I have had'); (ii) frustration with ill health (e.g. 'I am tired of feeling sick and would like to get to the bottom of my health problems'); (iii) high utilization of care (e.g. 'I have seen many different doctors over the years'); (iv) excessive health worry (e.g. 'I often fear the worst when I develop symptoms'); (v) psychological distress (e.g. 'Sometimes I feel depressed and cannot seem to shake it off'); and (vi) discordant communication of distress (e.g. 'It is difficult for me to find the right words for my feelings'). The reliability of the questionnaire was not reported. However, a large clinical validity study of the authors with patients of a general medical clinic showed that some of the scales discriminated SFD patients from severely ill patients as well as from non-somatizing control subjects.

Discussion

An impressive number of diagnostic methods and instruments have been developed since the SFDs were introduced as a distinct diagnostic concept. This group was first defined in 1980 by criteria specifying symptoms, syndromes and associated features such as onset, course and differential diagnostic considerations. Diagnostic instruments were primarily needed to make reliable diagnoses and measure treatment effects. The assessment tools described in this review were grouped according to their different main features and purposes. They are summarized in Table 2. The focus was on instruments which were either used by different

Table 2. Overview of instruments reviewed in this article

Instrument	Purpose of assessment	Application	Disorders ^a	Reliability	Validity
SCID	classification	interview	S/H	+	general "gold standard" for mental disorders
CIDI	classification	interview	S/H	+	tendency to under-diagnose SFDs if used by lay interviewers
IDCL	classification	interview	S/H	+	comparable with "gold standard" instruments
SDS	classification	interview	S/H	+	"gold standard" for SFDs if based on expert ratings
SCAN	classification	interview	S/H	unknown	comparable with SCID
PRIME-MD	classification	interview	S/H	unknown	degree of concordance with "gold standard" instruments unknown
SOMS-2	screening	self-rated	S/H	+	high sensitivity/specificity
Seven Symptom Screening Test	screening	interview	S	unknown	high sensitivity/specificity
Swartz Screening Index	screening	interview	S	unknown	high sensitivity/specificity
WHO-Screener for SFDs	screening	interview	S/H	unknown	sensitivity/specificity unknown
SOMS-7	syndrome severity	self-rated	S	+	good congruence with classification systems
SCL-90R Somatization scale	syndrome severity	self-rated	S	+	only small number arbitrarily chosen symptoms
Symptom Questionnaire	syndrome severity	self-rated	S	+	unclear boundaries between somatic symptoms and well-being
BSI	syndrome severity	self-rated	S	unknown	aims to assess bodily complaints related to depression/anxiety
WI	syndrome severity	self-rated	H	+	high sensitivity/specificity with hypochondriacal disorder
IAS	syndrome severity	self-rated	H	+	high sensitivity/specificity with hypochondriacal disorder
HAQ	syndrome severity	self-rated	H	+	congruent with cognitive-behavioral approach
MMPI-2 Hysteria/Hypochondriasis	syndrome severity	self-rated	S/H	+	combines personality, cognitive, emotional and somatic aspects
MMPI-2 Health Concerns	syndrome severity	self-rated	S	+	large number of symptoms but not related to classification systems
SSAS	associated features	self-rated	—	+	congruent with Barsky's "somatosensory amplification" concept
CABAH	associated features	self-rated	—	+	congruent with cognitive-behavioral approach
HNST	associated features	card sorting	—	+	selected aspect of cognitive appraisal
SIQ	associated features	self-rated	—	+	congruent with theoretical assumptions on symptom attribution
SAIB	associated features	self-rated	—	+	congruent with cognitive-behavioral approach
IBQ	associated features	self-rated	—	+	only loosely connected with modern formulations of SFDs
Health Attitude Survey	associated features	self-rated	—	unknown	combines associated features in only one instrument

^aS = Somatic-symptom-related disorders; H = Hypochondriasis; + indicates well-established reliability.

international research groups or whose psychometric status was systematically evaluated. The rationale for such selection can be seen in the following: (i) one important goal of broadly accepted instruments is that research findings from different countries and settings can be compared directly; and (ii) the availability of high-quality instruments facilitates their application in clinical institutions and by mental health practitioners who may wish to use them on a day-to-day basis as diagnostic and treatment tools.

It is inevitable that when the different methods and instruments are compared, some problems and basic principles associated with the assessment of SFDs become apparent. They are mainly concerned with our general understanding of the nature and characteristics of this complex diagnostic group. Some of these questions will be discussed briefly below.

Classification systems as a common framework

Many instruments refer to the definitions of SFDs as specified in DSM-IV or ICD-10. In this review we have deliberately focused on such instruments because we believe that our current classification systems provide a common framework which is acceptable to many

researchers and clinicians in different countries. As the diagnostic categories of DSM-IV and ICD-10 are very similar, a more or less uniform concept of the SFDs exists worldwide. It is important to note that both systems are equal in defining single somatic symptoms as 'somatoform' whenever there are insufficient somato-medical explanations. Mechanisms and factors which lead to the development of such somatic complaints are not included because little is known about the exact nature of etiological processes and their interactions. Some authors have criticized the fact that pathogenetical and etiological considerations were abandoned by DSM-IV and ICD-10 (e.g. 73). However, we feel that such considerations are still too speculative and lead to low diagnostic reliability. It should be remembered that it was a major advance of the descriptive systems DSM-IV and ICD-10 to provide relatively clear and operationalizable definitions which enable reliable diagnoses (14,74).

The orientation of this review towards DSM-IV and ICD-10 does not mean that we want to suggest that the SFD categories of these systems should be seen as perfect or final. There are some clear weaknesses which can be improved in future revisions according to new

empirical knowledge. For example, the criteria of somatization disorder have repeatedly been criticized as too strict and lower thresholds aiming to better define clinically relevant somatization syndromes were proposed (33,36,37,75). The term 'Somatic Symptom Index' (SSI) was coined by Escobar et al. (32) to define an abridged somatization disorder for which a minimum number of eight lifetime somatoform symptoms ('SSI-8') seems to be an empirically founded and reasonable threshold (76).

The differentiation between somatic and hypochondriacal symptoms

There is a growing consensus that two subgroups of SFDs should be distinguished: those with bodily symptoms as the primary clinical feature and those mainly characterized by health-related anxieties and convictions. The first subgroup is represented by the diagnoses somatization disorder, undifferentiated somatoform disorder, pain disorder, somatoform autonomic dysfunction and conversion disorder, all of which have somatic symptoms as the predominant feature in their clinical picture. The second subgroup refers to the diagnosis of hypochondriasis. The instruments described in this paper clearly reflect the need for this differentiation. Since the symptoms of both subgroups neither exclude nor predict each other, the general principle of comorbidity (multiple diagnoses) plays an important role. If a person suffers from somatization symptoms and also develops enduring anxieties that these symptoms might indicate a serious disease, the comorbid diagnoses of a somatic symptom-related disorder (e.g. somatization disorder) and hypochondriasis should be made.

Leibbrand et al. (77) demonstrated different profiles of this comorbidity. While the majority of their patients diagnosed as hypochondriacal also had multiple somatization symptoms, only a smaller proportion of patients with full or abridged somatization disorder additionally developed the full picture of hypochondriasis. Other studies have shown that hypochondriasis is closely related to anxiety disorders (78). It is therefore recommended that attention should be drawn to somatic symptoms as well as hypochondriacal anxieties/convictions when subjects are evaluated for SFDs.

The differentiation between poly- and monosymptomatic SFDs

Another important diagnostic issue refers to the number and nature of somatization symptoms. Many patients develop multiple symptoms in

different parts and organs of the body. These are usually diagnosed as having a full or abridged somatization disorder (somatization syndrome) or somatoform autonomic dysfunction. Other clinical pictures are restricted to only one type of symptom, e.g. only pain symptoms (pain disorder) or only pseudoneurological symptoms (conversion disorder). Reflecting these two types of clinical presentation and based on an empirical analysis of the frequencies and interrelations of somatization symptoms, we have suggested differentiating between poly- and monosymptomatic SFDs (76). This differentiation seems to have nosological value, as shown by Hiller et al. (79), who found that pain patients with additional somatization syndrome had higher levels of affective and sensory pain sensations, more pain-related disabilities and less treatment success than 'pure' pain patients.

However, there is also evidence that currently existing DSM-IV and ICD-10 diagnoses of SFDs do not cover all relevant clinical conditions. For example, it is being debated whether the monosymptomatic categories should be broadened to include a gastrointestinal syndrome (e.g. irritable bowel syndrome) and whether there should be a separate polysymptomatic category with fatigue as the primary complaint (neurasthenia or chronic fatigue syndrome). Nevertheless, the future revisions of the classification systems should accept new diagnostic categories only when sufficient scientific and empirical evidence can prove their specific nosological status.

Agreement on somatic symptoms list relevant for the somatization syndrome

As many as 33 somatic symptoms are listed as potential symptoms for somatization disorders in DSM-IV, 14 for somatization disorder in ICD-10 and 16 for somatoform autonomic dysfunction. Although all these symptoms were used to construct the SOMS questionnaire described above, it is debatable whether the given selection of symptoms is adequate and sufficient. Rief and Hiller (76) showed, in a psychometric item analysis, that some of these symptoms were very rare and weak discriminators between patients with and without somatization syndrome. If present, however, even rare symptoms may be of high diagnostic importance. Another problem is that not all relevant symptoms have been included in the symptom lists. For example, the so-called Rome-II criteria (80), widely used to diagnose irritable bowel syndrome and other gastrointestinal syndromes, list more gastrointestinal symptoms than do

DSM-IV or ICD-10. Similarly, cardiovascular and respiratory symptoms are underrepresented in the current lists although such symptoms are quite common amongst somatizing patients (81).

In summary, there is a clear need to work further on the list of potential symptoms which are to be considered for diagnosing SFDs. While the focus should be on frequently occurring symptoms, rare but typical symptoms should also be included. Diagnosticians must be aware that all existing symptom questionnaires are to some degree incomplete and arbitrarily selected. However, we feel that it is important to reach a high international agreement about future symptom lists and that this goal can best be achieved if the lists reflect the diagnostic criteria of internationally accepted classification systems.

Differentiating somatoform and depressive disorders

One important feature of our current classification approaches is the principle of comorbidity. Due to this principle, the SFDs are more and more regarded as a distinct diagnostic group which is independent from other disorders, especially from depressive disorders. This is in contrast to traditional nosology where unexplained somatic symptoms had often been interpreted as somatic components or 'somatic expressions' of depression (82,83). The formulation of the SFDs as an independent diagnostic group has stimulated research and the development of specific treatment strategies (84,85), which is also reflected by many of the available instruments.

Conclusions

In spite of the availability of detailed definitions and highly specified diagnostic criteria, it is not uncommon that SFDs are overseen (86). If physicians or psychologists do not receive sufficient training and are not familiar with typical signs and symptoms, they may easily underestimate the clinical relevance of somatization symptoms or simply subsume them under one of the more 'classic' depressive, anxiety or psychotic disorders. Unrecognized SFDs can have a negative impact on patients who may feel that they have not been properly understood. This, in turn, can negatively influence their management or treatment. The assessment strategies and instruments summarized in this article represent valuable tools for identification of SFDs and their associated characteristics. Many of them were developed within the framework of SFDs as a distinct clinical group.

Therefore they can be seen as a 'family of instruments' that should be used to enhance international cooperation and comparability of research findings in the years to come.

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