Health Anxiety (Hypochondriasis): an Emotional Disorder in An Alternative Taxonomy

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Abstract: The DSM-5 revision of the health anxiety classification (i.e., hypochondriasis) highlights deficiencies in the present DSM taxonomy and the need to consider an alternative. Health anxiety is a clinical syndrome that has been and remains difficult to classify in the DSM system. We argue that the current DSM-5 proposal that splits this syndrome between two diagnoses, somatic symptom disorder (SSD) and illness anxiety disorder (IAD), has significant limitations. We anticipate that SSD will problematically increase comorbidity because criteria for this syndrome feature nonspecific symptoms that overlap with depressive and anxiety disorders. Further, the proposed IAD criteria are overly restrictive and not likely to capture the heterogeneous presentation of individuals with anxiety about their health. We propose an alternative organization that will increase the clinical utility and construct validity of many DSM-IV-TR, Axis I disorders, including health anxiety. This taxonomy, proposed by Goldberg, Krueger, Andrews and Hobbs, is based on the shared etiology of syndromes called emotional disorders. The emotional disorders include health anxiety, other somatiform, unipolar depressive, and anxiety disorders, all of which share the risk factor of negative emotionality/neuroticism (NE/N).

We propose a research agenda to support this alternative taxonomy.

Keywords: Emotional disorders, health anxiety, hypochondriasis, illness anxiety disorder, negative emotionality, neuroticism, somatic symptom disorder, taxonomy.

INTRODUCTION

The redefinition of health anxiety or hypochondriasis in the Diagnostic and Statistical Manual, 5th edition (DSM-5) highlights persistent problems with the present taxonomy and the need to consider an alternative [1-8]. A common complaint is that the DSM is reified with each edition but largely without benefit of empirical research [6, 7]. To better reflect research we will use the term health anxiety rather than hypochondriasis. Like many clinical syndromes, health anxiety has characteristics that cross diagnostic boundaries and suggest a shared etiology [6, 7, 9-11]. For health anxiety, the mixture of anxiety (e.g., disease fear) and somatization (e.g., unexplained somatic sensations) is incompatible with a diagnostic system that assigns disorders to narrowly defined diagnostic categories [9, 12]. A case will be made for a taxonomy of the emotional disorders (i.e., unipolar depressive, anxiety and somatoform syndromes) that transcends Axis I diagnostic boundaries with one shared etiology [10, 13-16].

Health anxiety is an exemplar of problems with the DSM classification system and of issues that warrant consideration of an alternate taxonomy. To support this perspective, weaknesses of past DSM versions will be reviewed [6, 7]. This will be followed by commentary on deficiencies of the earlier and the newly revised DSM criteria for hypochondriasis. The symptoms that are unique to health anxiety and those it shares with other emotional disorders will be discussed [17-21]. Our analysis of specific symptom clusters that define this syndrome suggests that this is a valid clinical entity. The nonspecific symptoms of negative emotions and somatic sensations that health anxiety shares with other emotional disorders point to a common etiology that is known as either Neuroticism or Negative Emotionality (N/NE) [10, 22, 23]. Consequently, health anxiety and many other Axis I disorders appear to belong within a unified and hierarchical taxonomy that incorporates the unique and nonspecific characteristics of psychopathology [10, 13, 24].

GENERAL WEAKNESSES OF THE DSM

An overview of the DSM’s limitations provides a context for our discussion of health anxiety. Organization of the DSM has been largely phenomenological with disorders being grouped according to similar, observed symptoms [6, 7, 10, 25]. This organization has been criticized for not only having atheoretical groupings, but also for having many disorders that do not conform to one category (e.g., schizoaffective and conversion disorder) [6, 26]. In addition, the DSM’s categorical approach assumes that disorders are discrete, independent, and etiologically unique. Such a categorical taxonomy is incompatible with much of what is known about psychopathology. The frequency of comorbidity,
both within and across categories, implies one or more shared etiological factors [6, 25]. Furthermore, the DSM has long assumed homogenous disorders defined by binary criteria (i.e., the presence or absence of specific symptoms) and judgment about severity [7, 26]. Research suggests, however, that the majority of psychopathologies are dimensional. In other words, most types of psychopathology are heterogeneous with multiple symptoms that increase in severity along a continuum [26, 27].

PHENOMENOLOGICAL ORGANIZATION

Health anxiety (i.e., hypochondriasis) does not conform to a single category in the Diagnostic and Statistical Manual of Mental Disorders (DSM) [7, 9, 12]. This syndrome’s mixed symptoms of anxiety (e.g., health worry and illness fear) and somatization (e.g., unexplained somatic symptoms) have been difficult to classify starting with the DSM-III [28]. For many of the somatoform syndromes, the distress and dysfunction are a consequence of pathological somatic symptoms (e.g., pain) [29, 30]. For health anxiety, the distress and dysfunction result from the anxious misperception of innocuous somatic symptoms [29, 30]. This syndrome’s questionable fit within the somatoform grouping was acknowledged in the DSM-IV by dividing health anxiety into two disorders [12, 31]. Hypochondriasis remained a somatoform disorder while illness phobia was added to the anxiety disorders [12, 32, 33]. Studies of illness phobia indicate that it is very strongly related to health anxiety and is unlikely to be a separable syndrome [32-34].

The uncertainty about classifying health anxiety is now compounded by its reconceptualization in the somatic symptom disorders group of the DSM-5 (i.e., formerly the somatoform disorders) [1]. Although there were attempts to link the somatic symptom disorders to a common etiology, the current emphasis is now descriptive and focuses on somatic symptoms and psychological distress [3, 4, 35-38]. In this new class, health anxiety’s criteria are divided into two diagnoses somatic symptom disorder (SSD) and illness anxiety disorder (IAD) [1]. The new IAD diagnosis is shown in Table 1. It is defined by symptoms that have traditionally been attributed to health anxiety [1]. Contradictions in the IAD criteria, however, limit its value as a diagnosis. The SSD diagnosis is shown in Table 2. It subsumes the DSM-IV diagnoses of hypochondriasis, somatization disorder, and pain disorder [1]. The new SSD criteria, however, represent the nonspecific symptoms shared by many Axis I disorders and not a single diagnosis.

ILLNESS ANXIETY DISORDER (IAD)

Although the IAD diagnosis clearly replaces aspects of health anxiety (hypochondriasis), its inconsistent definition makes its usefulness questionable. The DSM-5 somatic symptom disorders are grouped largely on the shared

Table 1. Diagnostic criteria: DSM-5 for illness anxiety (300.7) and DSM-IV-TR for hypochondriasis (300.7).

<table>
<thead>
<tr>
<th>DSM-5 Proposed Criteria: Illness Anxiety Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following 6 criteria must be met:</td>
</tr>
<tr>
<td>A. Preoccupation with having or acquiring a serious illness.</td>
</tr>
<tr>
<td>B. Somatic symptoms are not present or, if present, are only mild in intensity. If another medical condition is present or there is a high risk for developing a medical condition (e.g. strong family history is present), the preoccupation is clearly excessive or disproportionate.</td>
</tr>
<tr>
<td>C. There is a high level of anxiety about health, and the individual is easily alarmed about personal health status.</td>
</tr>
<tr>
<td>D. The individual performs excessive health-related behaviors (e.g., repeatedly checks his or her body for signs of illness) or exhibits maladaptive avoidance (e.g., avoids doctor appointments and hospitals).</td>
</tr>
<tr>
<td>E. Illness preoccupation has been present for at least 6 months, but the specific illness that is feared may change over that period of time.</td>
</tr>
<tr>
<td>F. The illness-related preoccupation is not better explained by the symptoms of another mental disorder, such as somatic symptom disorder, panic disorder, generalized anxiety disorder, body dysmorphic disorder, obsessive compulsive disorder, or delusional disorder, somatic type.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DSM-IV-TR Criteria: Hypochondriasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Preoccupation with fears of having, or the idea that one has, a serious disease based on the person’s misinterpretation of bodily symptoms.</td>
</tr>
<tr>
<td>B. The preoccupation persists despite appropriate medical evaluation and reassurance.</td>
</tr>
<tr>
<td>C. The belief in Criterion A is not of delusional intensity (as in Delusional Disorder, Somatic Type) and is not restricted to a circumscribed concern about appearance (as in Body Dysmorphic Disorder).</td>
</tr>
<tr>
<td>D. The preoccupation causes clinically significant distress or impairment in social, occupational, or other areas of functioning.</td>
</tr>
<tr>
<td>E. The duration of the disturbance is at least 6 months.</td>
</tr>
<tr>
<td>F. The preoccupation is not better accounted for by Generalized Anxiety Disorder, Obsessive-Compulsive Disorder, Panic Disorder, a Major Depressive Episode, Separation Anxiety, or another Somatoform Disorders.</td>
</tr>
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</table>
Table 2. Diagnostic criteria: DSM-v somatic symptom disorder.

<table>
<thead>
<tr>
<th>DSM-5 Proposed Criteria: Somatic Symptom Disorder</th>
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<tbody>
<tr>
<td>A. One or more somatic symptoms that are distressing or result in significant disruption in daily life.</td>
</tr>
<tr>
<td>B. Excessive thoughts, feelings, and behaviors related to these somatic symptoms or associated health concerns as manifest by at least one of the following:</td>
</tr>
<tr>
<td>(1) Disproportionate and persistent thoughts about the seriousness of one's symptoms.</td>
</tr>
<tr>
<td>(2) Persistently high level of anxiety about health or symptoms.</td>
</tr>
<tr>
<td>(3) Excessive time and energy devoted to these symptoms or health concerns.</td>
</tr>
<tr>
<td>C. Although any one symptom may not be continuously present, the state of being symptomatic is persistent (typically more than 6 months).</td>
</tr>
<tr>
<td>Specify if:</td>
</tr>
<tr>
<td>With predominant pain (previously pain disorder): This specifier is reserved for individuals whose somatic symptoms predominantly involve pain.</td>
</tr>
<tr>
<td>Specify if:</td>
</tr>
<tr>
<td>Persistent A persistent course is characterized by severe symptoms, marked impairment, and long duration (more than 6 months)</td>
</tr>
<tr>
<td>Specify current severity:</td>
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<tr>
<td>Mild: Only one of the B criteria fulfilled,</td>
</tr>
<tr>
<td>Moderate: Two or more of the symptoms specified in Criterion B are fulfilled.</td>
</tr>
<tr>
<td>Severe: Two or more symptoms specified in Criterion B are fulfilled, plus there are multiple somatic complaints (or one very severe somatic symptom).</td>
</tr>
</tbody>
</table>

characteristic of distressing somatic symptoms [1, 3]. The classification of IAD, however, is an anomaly because its criteria specify that somatic symptoms are nonexistent or negligible (i.e., see Table 1) [1]. It is possible that IAD is intended to integrate health anxiety with illness phobia; the current DSM-IV-TR illness phobia is defined without somatic symptoms [1]. It is possible that IAD is intended to integrate health anxiety with illness phobia; the current DSM-IV-TR illness phobia is defined without somatic symptoms. Nevertheless, there is little empirical support for the separation of illness phobia from health anxiety, and this severely limits the validity of IAD [16, 32-34].

Another inconsistency with regard to IAD has to do with whether the disorder is categorical or dimensional. Until recently, the DSM defined psychopathology categorically with each disorder having a largely homogeneous symptom presentation [7]. In addition, only the most severe symptoms qualified towards a diagnosis. The authors of the DSM-5 now propose a dimensional rating system for SSD, and the symptoms are rated on a continuum of severity (i.e., see Table 2) [1]. This revision acknowledges that the symptoms of psychopathology (a) may be clinically disabling even below thresholds previously defined by the DSM and (b) may vary in their number and severity resulting in a heterogeneous presentation [6, 26]. Table 1 shows that the IAD criteria, however, remains categorical. A diagnosis requires that all criteria must be present and be clinically disabling [1]. We question whether these restrictive criteria will capture many cases deserving clinical attention.

**SOMATIC SYMPTOM DISORDER (SSD) AND COMORBIDITY**

SSD criteria are largely defined by nonspecific symptoms shared with Axis I disorders [1, 25, 26, 39]. Health anxiety is frequently comorbid with Axis I disorders and shares with them a constellation of nonspecific symptoms that are psychological (e.g., fear, anger, distress) and somatic (e.g., muscle tension, muscle aches, gastrointestinal disturbances, fatigue) [22, 23, 26, 40-43]. Such nonspecific symptoms are manifestations of comorbidity between Axis I disorders, including health anxiety [22, 25, 39, 44]. Table 2 shows that SSD criteria A and B are largely composed of these nonspecific symptoms [1, 39]. As previously noted, such symptoms are shared by depressive, anxiety, and somatoform disorders. For this reason, the SSD criteria are likely to identify, but not discriminate between, Axis I disorders. Therefore, the category of SSD, by itself, may not be informative.

The more important issue for the DSM-5 criteria and health anxiety is that nonspecific symptoms and Axis I comorbidity are explained by a common etiology [23, 24, 26, 44]. There is substantial, empirical support for that etiology being Neuroticism or Negative Emotionality (N/NE), a broad personality trait that falls on a continuum of adaptive functioning [23, 26, 45, 46]. The more maladaptive variant of this trait is characterized by a tendency to experience unpleasant emotions, over-report somatic symptoms, and be overly reactive to stress [22, 44]. Convergent findings from meta-analyses and genetic studies suggest that this tendency is moderately heritable and a risk factor for many DSM-IV-TR, Axis I disorders [16, 23, 46-50]. Furthermore, the relationship of N/NE with health anxiety is supported by a robust body of research [13, 49, 51-61]. It is important, therefore, that any taxonomy with health anxiety should feature N/NE as a broad, shared etiological factor with other Axis I disorders [10, 60, 62].
SPECIFIC SYMPTOMS OF HEALTH ANXIETY

Although nonspecific symptoms are important, the unique symptoms that define health anxiety are also essential to understanding the disorder [18, 25, 56]. Research and theory have advanced a wide range of core symptom dimensions for health anxiety [17, 18, 20, 54]. Findings from factor analyses of widely used measures, however, offer support for the following four, core dimensions: (a) cognitive–disease conviction, (b) affective–illness worry, (c) perceptual–somatic sensitivity, and (d) behavioral–reassurance-seeking [17, 19, 20, 63, 64]. There are unresolved issues concerning these and additional candidate dimensions for health anxiety.

The cognitive, affective, and perceptual symptom dimensions are unique aspects of health anxiety [17, 19, 20, 65]. The cognitive dimension has been referred to as disease conviction and is the preoccupation with having an illness despite contrary evidence [17]. The affective dimension has been referred to illness worry and is the fear of having or developing an illness. Although these two dimensions have been aggregated in previous versions of the DSM, there is empirical support for their being related but separable aspects of health anxiety [17, 20, 28, 31, 54]. The perceptual dimension has been referred to as somatic sensitivity, but its definition is in flux. For example, somatosensory amplification, the tendency to perceive somatic sensations as noxious, is no longer thought to be specific for health anxiety [65]. This construct has been shown to be associated with a number of different types of psychopathology [66, 67]. Redefining this perceptual dimension as somatic sensitivity, the subjective sensitivity to innocuous somatic sensations, appears to have greater specificity for health anxiety [17].

Reassurance seeking and illness phobia also merit consideration as dimensions for health anxiety. The behavioral dimension of reassurance seeking is the effort to obtain social support and allay illness worry [25]. A recent review of reassurance seeking concluded that this behavior is specific to patients diagnosed with hypochondriasis compared to those with the more generic multiple unexplained symptoms [68]. In addition, illness phobia, the fear of contracting an illness, is strongly related to health anxiety; and may be a potential dimension of health anxiety [10, 32-34].

CONSTRUCT VALIDITY OF HEALTH ANXIETY

Reviewing the construct validity of the current criteria for health anxiety (i.e., hypochondriasis) suggests that this clinical entity has a foundation for further development. Recent reviews questioning the validity of the somatoform disorders have neglected research supporting the conceptual and clinical relevance of health anxiety [29, 69, 70]. We will address this deficiency by integrating empirical data that allow credible and theoretically consistent inferences to be made about the nature and existence of this syndrome [71].

One aspect of construct validity is clinical utility or how well criteria facilitate professional communication, provide prognostic information, and guide treatment. Studies suggest that the criteria for health anxiety facilitate accurate identification and communication across mental health and medical professions [72, 73]. For example, these professionals appear to recognize and agree about the symptoms characteristic of this syndrome and its most common treatment (i.e., cognitive-behavioral) [72, 73]. Despite this, however, some medical professionals are unwilling to place the diagnosis of hypochondriasis in medical records [74]. The reason for this is that the term, hypochondriasis, has pejorative connotations that may be unacceptable to patients [11, 29, 74]. An effective solution has been to use the less stigmatizing term, health anxiety [9, 11, 29].

The clinical utility of health anxiety criteria are supported by prediction of clinical outcomes [29, 71]. Patients with severe, untreated health anxiety have poorer functioning, greater disability, and higher utilization of health care than those without health anxiety [75-78]. A systematic review of six longitudinal studies found the course is chronic and that fifty to seventy percent of untreated cases persisted over periods ranging from 11 to 24 months [79]. Despite this natural course, it is recognized across disciplines that health anxiety is treatable [72]. A meta-analysis of six controlled, clinical trials using psychosocial treatments showed a large effect size for the reduction of health anxiety [80].

Additional construct validation can also be inferred from studies of this syndrome’s prevalence and discriminant validity. There have been no recent epidemiological studies of health anxiety with representative, adult samples using the most restrictive DSM or ICD criteria. A number of studies, however, have used these criteria in large samples (i.e., N > 500) [41-43, 81]. The studies generally suggest that this syndrome’s prevalence is similar to that of panic disorder; it ranges from .02% to 4.5% in community settings and from 2.6% to 4.7% in medical settings [41-43, 81-83]. Furthermore, studies using self-report measures suggest that health anxiety symptoms can be distinguished from the symptoms of panic, somatization, and obsessive-compulsive syndromes [84-86].

Construct validity of this syndrome is further strengthened by theoretically consistent etiological factors [71]. Consistent with an integrated model of psychopathology, behavioral genetic studies suggest that health anxiety is moderately heritable with environmental contributions [52, 54, 87]. In accord with interpersonal and cognitive-behavioral theories, retrospective studies indicate that health anxiety is associated with specific environmental antecedents [9, 88]. These include exposure to parents with physically hazardous occupations or substance-related problems and traumatic childhood experiences with illness, injury, or abuse [9, 52, 89]. Individuals with health anxiety also report having experienced significantly more social modeling of concern for and attention to somatic symptoms [90-92].

IMPLICATIONS OF REVIEWED FINDINGS

Health anxiety is a bellwether that calls for a taxonomy that incorporates, rather than disregards, empirically supported specific and nonspecific characteristics of psychopathology. The DSM-5 grouping of somatic symptom disorders and the decision to split the diagnosis of hypochondriasis (i.e., health anxiety) between SSD and IAD are unsatisfactory. The DSM-5 creates issues that might be remedied in a boarder context. We propose an organization that is hierarchical, with a general risk factor of N/NE that health anxiety shares with the depressive, anxiety, and other
somatoform syndromes [29, 42]. Moreover, this taxonomy should include appropriately validated unique symptoms of health anxiety. We will show that this organization is supported by research and may facilitate both scientific progress and further definition of the specific symptoms of health anxiety [14-16, 28].

AN ALTERNATE TAXONOMY

One of the DSM-5 committees proposed a hierarchical taxonomy with the superordinate trait of N/NE, an etiological factor for a broad group of syndromes called the emotional disorders (see Fig. 1) [10, 15, 93]. This committee defined the emotional disorders as the depressive (i.e., major depressive disorder, and dysthymic disorder), anxiety (i.e., generalized anxiety disorder, panic disorder, traumatic states, obsessional states, and phobias) and somatoform syndromes (i.e., health anxiety, somatization, conversion, and pain) [10]. The committee presented empirical findings that all these emotional disorders share N/NE and the nonspecific symptoms of anxiety, fear, and somatic symptoms [10, 23, 24, 39, 44, 57, 60, 94]. Because N/NE accounts for a quarter of the variance the emotional disorders share, the committee investigated additional categories for potential etiological/risk factors [10].

This proposed hierarchical framework has advantages over existing and proposed DSM taxonomies for health anxiety and the emotional disorders. The risk factor N/NE for the mood, anxiety, and somatoform syndromes has substantial empirical support and provides a foundation for scientific progress [23, 57, 60]. Unfortunately, the above mentioned committee was unable to give full attention to health anxiety [10]. To better address this syndrome we will examine contemporary research (i.e., from the years 2000 to 2011) linking health anxiety with the other emotional disorders. Table 3 shows categories chosen by the committee that we applied to health anxiety.

Table 3 presents research supporting the temperamental antecedent, N/NE, as a robust etiological factor for health anxiety. Ten studies show remarkably similar findings across diverse samples and measures [17, 51, 56, 58, 61, 95-99]. A more precise gauge is a meta-analysis showing similar, large effect size for the relationship of this personality trait with health anxiety and all assessed Axis I disorders [57]. There are also compelling behavioral genetic studies that support the common etiology of N/NE for health anxiety and other emotional disorders [49, 54].

This DSM-5 committee cited empirical support for N/NE’s contribution to similarities in symptoms and comorbidity among the emotional disorders. Table 3 identifies these similarities for health anxiety. The nonspecific symptomatology of N/NE is consistently captured by latent class and structural equation modeling analyses that identify a common underlying relationship between the depressive, anxiety, and somatoform syndromes [82, 94, 100]. In the table, under symptomatology, five studies point to this relationship with N/NE and health anxiety [13, 55, 56, 60, 101]. We noted earlier that common or nonspecific symptoms explain the observed comorbidity among the emotional disorders, and four studies document this comorbidity with health anxiety [40-43].

The shared nonspecific symptoms also suggest a unified protocol with core techniques to treat the emotional disorders [14, 93, 102-106]. The efficacy of transdiagnostic psychotherapy for multiple emotional disorders is suggested by the efficacy of many treatment studies using the integrated psychotherapy protocol in both group and individual formats [14, 105, 106]. Table 3 features a meta-analysis of health anxiety psychotherapy studies suggesting that a wide variety

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Note: The emotional disorder taxonomy encompasses many Axis I disorders from the DSM-IV-TR and is not restricted to the selected mood, anxiety, and somatoform disorders shown in the figure. We have selected these syndromes only for brevity and clarity.
Table 3. Factors reviewed for shared etiology of health anxiety with the emotional disorders.

<table>
<thead>
<tr>
<th>Category of Risk Factor</th>
<th>Type of Study or Risk Factor</th>
<th>Reference</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperamental antecedents</td>
<td>Negative emotionality and health anxiety</td>
<td>[17, 51, 56, 61, 95-99]</td>
<td>Generally strong to moderate correlations of various HA and neuroticism/negative emotionality (N/NE) measures across a variety of samples</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[57]</td>
<td>Meta-analysis shows similar large effect size for the relations of N/NE with HA, mood and anxiety disorders</td>
</tr>
<tr>
<td>Genetic</td>
<td>Behavioral Genetic</td>
<td>[53]</td>
<td>Strong genetic and environmental contributions to HA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[49]</td>
<td>Sub-threshold emotional disorders and HA share common genetic link</td>
</tr>
<tr>
<td>Symptomatology</td>
<td>Latent Class Analysis</td>
<td>[101]</td>
<td>Latent class analysis showed a shared factor (NE) for classes of anxiety disorders, depression, HA, body dysmorphic disorder, and eating disorders (sample of relatives, controls and OCD probands)</td>
</tr>
<tr>
<td></td>
<td>Structural Equation Modeling</td>
<td>[55]</td>
<td>Path analysis shows NE is a common latent factor for HA, OCD, panic symptoms and GAD (undergraduate sample)</td>
</tr>
<tr>
<td></td>
<td>Structural Equation Modeling</td>
<td>[13]</td>
<td>Path analysis shows NE is a common latent factor for HA, OCD, panic symptoms and GAD (clinical sample)</td>
</tr>
<tr>
<td></td>
<td>Structural Equation Modeling</td>
<td>[60]</td>
<td>CFA shows NE (internalizing) is a common latent factor for depression, hypochondriasis, somatization, neurasthenia, anxious worry and anxious arousal (primary care sample)</td>
</tr>
<tr>
<td></td>
<td>Structural Equation Modeling</td>
<td>[56]</td>
<td>CFA shows NE is a common latent factor for HA, OCD and panic symptoms (undergraduate sample)</td>
</tr>
<tr>
<td>Comorbidity</td>
<td></td>
<td>[40]</td>
<td>HA comprised 4.5% of a female sample recruited for a study of depression and it was moderately comorbid with major depression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[42]</td>
<td>HA comprised 4.7% of a sample of internal medical inpatients (using DSM-IV hypochondriasis criteria), of these cases 17% were comorbid with major depression and 7% with anxiety</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[43]</td>
<td>HA comprised 2.5% of a tertiary care sample screened for multi-somatoform disorder; HA had substantial overlap with depressive and anxiety disorders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[41]</td>
<td>HA comprised 4% of the primary care sample and all had comorbid anxiety, mood and/or somatoform disorders. About 65% of the cases were comorbid with one or more anxiety disorders</td>
</tr>
<tr>
<td>Treatment</td>
<td>Meta-analysis</td>
<td>[80]</td>
<td>Large effect size for HA symptom reduction with psychotherapy across a broad range of modalities</td>
</tr>
<tr>
<td>Familial</td>
<td>Family environment (retrospective)</td>
<td>[90]</td>
<td>Young adults with higher levels of HA had history of greater parental reinforcement and modeling of concern for somatic symptoms</td>
</tr>
<tr>
<td></td>
<td>Family environment (retrospective)</td>
<td>[91]</td>
<td>History of parental overconcern about child’s health moderately related to higher HA</td>
</tr>
<tr>
<td></td>
<td>Family environment (retrospective)</td>
<td>[92]</td>
<td>Young adults with higher levels of illness/injury fears had history of greater parental reinforcement and modeling of concern for somatic symptoms</td>
</tr>
<tr>
<td>Early adversity</td>
<td>Adversity and trauma</td>
<td>[88]</td>
<td>Those with a diagnosis of hypochondriasis are significantly more likely to have childhood history of illness or injury, parental divorce, substance use problem, or a hazardous occupation</td>
</tr>
<tr>
<td></td>
<td>Abuse and adversity</td>
<td>[116]</td>
<td>Childhood adversity and sexual abuse moderately associated with higher HA scores</td>
</tr>
<tr>
<td></td>
<td>Adversity</td>
<td>[89]</td>
<td>Childhood adversity moderately related to HA scores</td>
</tr>
</tbody>
</table>
of treatment modalities have an overall large effect size for reducing health anxiety [80]. Consistent with the tenants of transdiagnostic psychotherapy, it is likely that all of these approaches address the nonspecific symptoms that health anxiety shares with the other emotional disorders.

The table includes studies of environmental antecedents that the committee believes are shared among the emotional disorders and that we have investigated for health anxiety [10]. Parental modeling, reinforcement, and overprotection generally contribute to the core pathological behaviors for those with the emotional disorders [107-113]. Three retrospective studies suggest that a history of parental overconcern about childhood health and parental modeling of somatic concerns contribute to the development of health anxiety [90-92]. Exposure to early stressors, such as childhood trauma or adversity (e.g., parental divorce, childhood abuse), and to experiences with illness may also contribute to development of emotional disorders [111-115]. Studies of health anxiety suggest its childhood antecedents are both disorder specific, such as experiences with illness or injury, and those more general, such as parental divorce and/or childhood sexual abuse [88, 89, 116].

Table 3 shows studies of health anxiety supporting the committee’s conclusion that a pattern of cognitive processing is similar across the emotional disorders [10]. In this regard, all the emotional disorders share a general cognitive bias towards the occurrence of negative, rather than positive, events [117, 118]. These biases, however, have some specificity. Anxiety is associated with attentional biases for threat, and depression is associated with memory biases for negative information [10]. The style of cognitive processing for health anxiety is most like the anxiety disorders [119]. A majority of studies have found high levels of health anxiety are associated with an attention bias for emotionally-relevant health and illness threats [120-124].

There were areas of research this DSM-5 committee felt were incomplete. Studies in these domains had insufficient information to support links between either the emotional disorders and/or health anxiety. These areas were as follows: (a) familial - there were no studies of family aggregation of health anxiety between 2000 to 2012; (b) neural substrates - neuroimaging studies are abundant, but few comprehensively assessed emotional disorders to allow for comparisons, and (c) biomarkers - biological measurements for mental disorders are in their infancy (e.g., hormones) and little information is available for any of the emotional disorders.

Although there is a need for additional research, a taxonomy based on the substantial commonalities that health anxiety shares with other emotional disorders requires consideration. Despite limitations in current knowledge, this etiologically based taxonomy of the emotional disorders provides an excellent scientific framework for further development of health anxiety. It provides a scientifically sound, comprehensive approach to investigating the emotional disorders. Furthermore, continuity with the existing system is maintained by including specific diagnoses (e.g., major depressive disorder, panic disorder, health anxiety) and allows for their advancement. Moreover, the research on health anxiety can be logically expanded and extended within this alternate taxonomy.

**FUTURE RESEARCH**

Health anxiety is understudied and there are many areas that require greater attention. However, the issues we raise in this review point forward to those of greatest importance. Two areas of research are particularly important to advance understanding of health anxiety and solidify its place within the emotional disorders. One area involves the further definition of the symptoms of health anxiety. This includes the illumination and identification of symptom dimensions that characterize this syndrome [9, 11, 17, 88]. Another area will clarify additional etiological factors health anxiety shares with other emotional disorders. This includes studies of genetic and environmental antecedents with improved methodologies that will lead to better identification of the processes that contribute to its maintenance [9, 10, 49, 52, 93].

Data that clarify the symptom dimensions of health anxiety will be a valuable addition; we mentioned symptom dimensions that have been either reliably identified or have the potential to define health anxiety [17-20, 33]. Although these require additional empirical study, there are some that require greater attention than others. For example, an unresolved issue is whether reassurance seeking is only one
example of a broader class of safety seeking behaviors aimed at detecting, avoiding, or enduring perceived threats [125, 126]. In addition, illness phobia is likely one aspect of health anxiety, rather than a separate syndrome, but this too needs additional investigation [32-34]. Again, other researchers have suggested additional core symptom dimensions that warrant more investigation [18-20].

Rating the severity of health anxiety symptoms along a continuum of severity is consistent with theory and research [27, 127, 128]. The importance of such ratings is suggested by research showing both that (a) a continuum of functioning extends from normal personality to psychopathology and (b) sub-threshold symptoms warrant attention because they often contribute to clinical impairment [3]. While the DSM-5 is likely to adopt dimensional ratings for some diagnostic criteria, the utility depends on a solid theoretical and empirical foundation [129]. An exigent task is to develop a clinically useful metric and valid model, such as the continuum of personality that may be applied across all the emotional disorders [6, 7, 24, 26].

Also needed are additional longitudinal and epidemiological studies that will answer questions about the prevalence and developmental course of health anxiety. We are aware of only one longitudinal and epidemiological study of health anxiety, specifically [130]. The majority of studies of the environmental risk factors for health anxiety are susceptible to recall biases being cross-sectional and retrospective [88, 90-92]. Additional epidemiological and longitudinal studies of health anxiety with diverse, nationally representative samples of adolescents and adults are needed to better understand age of onset and prevalence.

There have been three recent behavioral genetic studies relevant to health anxiety [49, 52, 54]. Of these pioneering investigations, two have examined only health anxiety [52, 54] and only one has included a majority of the other emotional disorders [49]. Although the latter included only one indicator of hypochondriasis, the conclusions about the common etiology were promising. Progress towards understanding the genetic contributions to health anxiety necessitates the use of a more comprehensive assessment.

At the broadest level, all the emotional disorders deserve additional study. We have reviewed the DSM-5 proposals that affect health anxiety along with a number of the somatoform disorders. Unfortunately, these proposals do little to advance understanding of health anxiety or to establish a more valid organization of mental disorders. A more expansive view of psychopathology is needed to elucidate health anxiety and the emotional disorders. We advocate a hierarchical taxonomy that is informed by a firm foundation of extensive research concerning the emotional disorders and their common etiology, the personality trait of N/NE.

CONFLICT OF INTEREST

The author(s) confirm that this article content has no conflict of interest.

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REFERENCES


