



The overlap of somatic, anxious and depressive syndromes: A population-based analysis



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ABSTRACT

Objective: The comorbidity of somatic, anxious and depressive syndromes occurs in half of all primary care cases. As research on this overlap of syndromes in the general population is scarce, the present study investigated the prevalence of the overlapping syndromes and their association with health care use.

Method: A national general population survey was conducted between June and July 2012. Trained interviewers contacted participants face-to-face, during which, individuals reported their health care use in the previous 12 months. Somatic, anxious and depressive syndromes were assessed using the Somatic Symptom Scale–8 (SSS–8), Generalized Anxiety Disorder–2 (GAD–2) and Patient Health Questionnaire–2 (PHQ–2) respectively.

Results: Out of 2510 participants, 236 (9.4%) reported somatic (5.9%), anxious (3.4%) or depressive (4.7%) syndromes, which were comorbid in 86 (3.4%) cases. The increase in the number of syndromes was associated with increase in health care visits (no syndrome: 3.18 visits vs. mono syndrome: 5.82 visits vs. multi syndromes: 14.16 visits, ($F_{(2,2507)} = 149.10, p < 0.00001$)). Compared to each somatic (semi-partial $r^2 = 3.4%$), anxious (semi-partial $r^2 = 0.82%$) or depressive (semi-partial $r^2 = 0.002%$) syndrome, the syndrome overlap (semi-partial $r^2 = 6.6%$) explained the greatest part of variance of health care use ($\text{change_in}R^2 = 11.2\%$, $\text{change_in}F_{(3,2499)} = 112.81, p < 0.001$).

Conclusions: The overlap of somatic, anxious and depressive syndromes is frequent in the general population but appears to be less common compared to primary care populations. To estimate health care use in the general population the overlap of somatic, anxious and depressive syndromes should be considered.

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1. Introduction

Somatoform, anxiety and depressive disorders are among the most frequently occurring mental disorders in primary care and in the general population [1,2]. Each of these diagnoses is associated with substantial health burdens and increased health care use [3,4]. In primary care settings, however, patients rarely present with a “pure” depressive, anxiety or somatoform disorder. Instead, patients often report a combination of somatic, anxious and depressive syndromes that have been described as the ‘Somatization-Anxiety-Depression Triad’ [1,5–7]. Thus far, the prevalence of the somatic, anxious and depressive (SAD) syndromes and their overlap has primarily been investigated in patients in primary care and mental health settings [8]. To understand the

epidemiology of these highly overlapping mental health syndromes, knowledge of the ‘natural’ prevalence of the overlap of single SAD syndromes in the general population is vital.

The prevalence of the comorbidity of the SAD syndromes has mainly been investigated in primary care patients: It is estimated that every second patient with one SAD syndrome comorbidly suffers from another of these syndromes [8]. Therefore, it is argued that in primary care patients, “...there is little evidence that depression, anxiety and somatization are separated by natural boundaries” [8]. The data on the overlap of SAD syndromes in the general population are yet not available; studies have investigated the prevalence rates of individual syndromes but have neglected the overlap of single SAD syndromes. These data, however, are crucial for objectively evaluating the overlap of single SAD syndromes at the level of the whole society and using this as the basis of comparison with clinical populations. In addition, knowledge of the overlap of single SAD syndromes is vital to determining whether prevention of the three most common mental health syndromes should focus on each individual syndrome or on all three SAD syndromes [9]. In terms of the comorbidity of psychiatric diagnoses,

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one large epidemiological study from Germany concluded that comorbidity is present in 44% of cases with psychiatric diagnoses [2]. The combination of anxiety-affective somatoform disorders occurred in 4.7% of all cases. To design effective prevention programs for psychiatric disorders, it is important to identify risk factors of individuals who are already experiencing mental health syndromes. Regarding the identification of risk factors for the three most common mental health syndromes, it is important to test whether individuals with overlapping SAD syndromes differ in terms of socio-demographic characteristics from individuals with no symptoms, single symptoms or multiple syndromes. Therefore, knowledge of the overlap of SAD syndromes in the general population is of great importance.

SAD syndromes contribute to a major health burden as well as to higher health care costs: Studies conclude that each individual syndrome has been found to be associated with increased health care use [3,4,10,11]. Despite the strong associations between SAD syndromes, however, most studies on health care use have not accounted for this overlap of single SAD syndromes. Thus, it is difficult to identify which syndrome contributes the most to health care use. To the best of our knowledge, only one study from primary care adjusted for the syndrome overlap and concluded that the overlap is associated with health care use rather than the individual syndromes alone [8]. Most studies that tested the association between SAD syndromes and health care use were conducted in primary care patients. However, the estimation of health care use may be biased in a selective sample of health care users because some individuals do not utilize the health care system despite experiencing symptoms [12]. To account for these individuals, data from the general population are necessary. However, data from the general population on health care use and SAD syndromes are rare, and the differential associations of the individual SAD syndromes have not yet been considered. Insights as to how the SAD syndromes overlap and are associated with health care use is important – not only to understand the health-related economic consequences of the three most common mental health syndromes but also to estimate and allocate health care resources.

Whereas previous studies have focused on primary care patients, this is the first study to investigate the overlap of single SAD syndromes in the general population. First, we analyzed the distribution of somatic, anxious and depressive syndromes and their overlap. Second, we tested whether there is a relationship between the number of syndromes and health care use. Third, we estimated the relative associations between each syndrome and the overlap of single SAD syndromes with health care use.

2. Material and methods

2.1. Study participants and study design

The study was part of a national, representative general population survey that analyzed individuals aged 14 years or above in Germany. The data were collected between June and July 2012 by professional demographic consultants (company name: Unabhängige Serviceeinrichtung für Umfragen, Methoden und Analysen, <http://www.usuma.com>, Berlin, Project No. 120402). A random-route sampling procedure with 320 sample points revealed that 4480 households were to be contacted as part of the study. Of the 4480 households, 4436 were eligible to participate (i.e., $n = 19$ flats were vacant, $n = 25$ persons were younger than 14 years). The households were visited by trained face-to-face interviewers who recorded the participants' demographic information. Other information was collected via paper-and-pencil self-reports. The interviewers made a maximum of 4 contact attempts per household. The individuals who participated gave oral informed consent. The participants did not receive any reimbursement. The study was approved by the medical ethics board at Leipzig University in Germany.

2.2. Study variables

Somatic symptoms were measured with the Somatic Symptom Scale – 8 (SSS-8) [13]. This questionnaire consists of eight items that measure the burden of common somatic symptoms (e.g., back pain, stomach or bowel problems; chest pain or shortness of breath; and fatigue). The SSS-8 is brief, valid and reliable ($\alpha = 0.81$). In the present study, Cronbach's α was 0.82. The cut-off scores allowed for the pragmatic classification of the severity of the somatic symptom burden. In accordance with previous studies, we used a cut-off of ≥ 12 points on a 0–32-point scale to identify individuals with high somatic symptom burdens [14]. In the present study, we use the term 'somatic burden syndrome' to refer to these individuals.

Depression was assessed using the Patient Health Questionnaire – 2 (PHQ-2) [15]. This questionnaire consists of two items that measure the fulfillment of the DSM-5 core criteria of major depression (depressed mood and loss of pleasure) and assesses the cognitive-affective aspect of depression. The PHQ-2 is brief, valid and reliable ($\alpha = 0.89$). In the present study, Cronbach's α was 0.74. A cut-off score of ≥ 3 on a 0–6 point scale is recommended for depression screening [16]. We used this cut-off to identify individuals with high levels of depression. In the present study, we use the term 'depressive syndrome' to refer to these individuals.

Anxiety was measured with the Generalized Anxiety Disorder – 2 (GAD-2) [15]. This questionnaire consists of two items that assess the DSM-V core criteria of the generalized anxiety disorder (anxiety and worry) and measures the cognitive-affective aspect of anxiety. The GAD-2 is brief, valid and reliable ($\alpha = 0.75$). In the present study, Cronbach's α was 0.75. The GAD-2 has good case-finding properties for the most common anxiety disorders: generalized anxiety disorder, panic disorder, social anxiety disorder, and post-traumatic stress disorder. A cut-off score of ≥ 3 on a 0–6 point scale is recommended for anxiety screening [17]. We applied this cut-off score to identify individuals with high levels of anxiety. In the present study, we use the term 'anxious syndrome' to refer to these individuals.

A shortened version of the Health Care Utilization Questionnaire was used to assess health care use [18,19]. The questionnaire comprises 5 items that measure the patient-reported retrospective count of contact with health care providers (e.g., GP visits, days in the hospital, daytime clinic visits) during the last 12 months.

2.3. Statistical analyses

In order to describe the distribution of syndromes, we calculated a cross-table of the following categories: somatic burden syndrome [yes vs. no] \times anxious syndrome [yes vs. no] \times depressive syndrome [yes vs. no]. Descriptive data are presented as absolute and relative numbers of individuals per cross-table cell.

For the analyses investigating health care use, individuals were assigned to three groups based on the degree of burden they reported. The first group included individuals with no syndrome, the second included individuals with one syndrome (i.e., mono anxious syndrome, $GAD-2 \geq 3$ points; mono depressive syndrome, $PHQ-2 \geq 3$ points; or mono somatic burden syndrome, $SSS-8 \geq 12$ points), and the third included individuals with two or three syndromes (i.e., multiple-syndromes). The mean numbers of health care visits were calculated for each group and were compared using an analysis of variance (ANOVA) followed by Tukey post-hoc tests. The group differences in health care use were quantified by using the Cohen's d effect size measure.

The relative impact of somatic, anxious and depressive symptoms and their overlap in health care use were estimated by using a multiple linear hierarchical regression model. To adjust the analysis for possible covariates, age, gender, living situation, employment status and income were entered 'block-wise' as a first step in the hierarchical regression model. As a second step, the continuous scores of the self-report SAD

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