



## The associated features of multiple somatic symptom complexes

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### ABSTRACT

**Objective:** To assess whether two or more functional somatic symptom complexes (SSCs) showed stronger association with psychosocial correlates than single or no SSC after adjustment for depression/anxiety and general medical disorders.

**Methods:** In a population-based sample we identified, by standardised questionnaire, participants with chronic widespread pain, chronic fatigue and irritable bowel syndrome, excluding those with a medical cause for pain/fatigue. We compared psychosocial variables in three groups: multiple (> 1), single or no FSS, adjusting for depression/anxiety and general medical disorders using ordinal logistic regression. We evaluated whether multiple SSCs predicted health status 1 year later using multiple regression to adjust for confounders.

**Results:** Of 1443 participants (58.0% response) medical records were examined in 990: 4.4% (n = 44) had 2 or 3 symptom complexes, 16.2% a single symptom complex. Many psychosocial adversities were significantly associated with number of SSCs in the expected direction but, for many, statistical significance was lost after adjustment for depression/anxiety and medical illness. Somatic symptoms, health anxiety, impairment and number of prior doctor visits remained significantly associated. Impaired health status 1 year later was predicted by multiple somatic symptom complexes even after adjustment for depression, anxiety, medical disorders and number of symptoms.

**Conclusions:** Depression, anxiety, medical illness and health anxiety, demonstrated an exposure-response relationship with number of somatic symptom complexes. These may be core features of all Functional Somatic Syndromes and may explain why number of somatic symptom complexes predicted subsequent health status. These features merit inclusion in prospective studies to ascertain causal relationships.

### 1. Introduction

Functional somatic syndromes (FSS), such as chronic fatigue syndrome (CFS), chronic widespread pain (fibromyalgia) and irritable bowel syndrome (IBS), are common reasons for presenting to medical services but their aetiology is not fully understood. The risk factors for these syndromes include: female gender, childhood adversity, prior infections, few years of education, low socio-economic status, recent threatening life events, anxiety and depressive disorders, health anxiety, neuroticism, general medical disorders and numerous somatic symptoms [1–7]. One of the most replicated risk markers, however, is the presence of another syndrome, i.e. having one FSS is strongly associated with having, or developing, another [3, 8–11]. In clinical populations between a half and a third of those with a single functional somatic syndrome have at least one more; in the general population the

prevalence of “polysyndromic” functional somatic syndromes has been shown to be 2–4% [9, 12–15].

It is not clear why the occurrence of one functional somatic syndrome predicts the development of another, and the risk factors for multiple, as opposed to single, functional somatic syndromes have not been extensively investigated. Several studies have found that multiple syndromes are associated with a high prevalence of depression and anxiety [13, 14, 16]. On the other hand, studies using latent class analysis of particular groups have suggested that patients with multiple FSS form a class of their own, separate from that comprised of anxiety and depression [9, 17].

Multiple functional somatic syndromes are associated with greater impairment of health status than single FSS and with a greater frequency of healthcare use [9, 14, 15, 17]. This might reflect the high prevalence of anxiety/depressive or general medical disorders, but

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other associated factors, such as numerous somatic symptoms, few years of education and abuse history are known to be associated with impairment and high healthcare use [11, 18–21].

The relationship between numerous somatic symptoms and multiple somatic syndromes is not clear. To some extent these are overlapping concepts as each FSS has its own list of somatic symptoms necessary for the diagnosis so more than one FSS is bound to be associated with a greater number of somatic symptoms. This appears to be confirmed by studies using cluster or latent class analysis; increasing total somatic symptom scores are associated with multiple somatic syndromes [12–14]. However, latent class analysis of somatic symptoms indicate separate classes for multiple FSS and multiple somatic symptoms [9, 17]. One way to study these closely associated phenomena is to identify the relationship of each with outcome; there is some evidence that chronic fatigue or chronic widespread pain are independent predictors of health status, in addition to depression/anxiety and number of somatic symptoms [19, 21, 22]. We are not aware of any previous prospective study that has assessed whether multiple FSS predicts outcome after adjustment for number of somatic symptoms, depression/anxiety and general medical disorders.

The current study uses data from a small, population-based study, which we have reported previously but we have not previously examined the correlates of multiple syndromes or considered them as a predictor of health status [22, 23]. The study allowed us to examine the presence of chronic fatigue, irritable bowel and chronic widespread pain, which we refer to as “somatic symptom complexes” as the study did not formally assess the presence of these functional somatic syndromes according to standardised criteria.

This study aimed to test the following hypotheses:

- 1) That multiple (2 or 3) somatic symptom complexes (SSCs) show a significantly higher number of associated features compared to single SSC or no SSC and there is an “exposure–response” relationship across the three groups (multiple, single and no SSC).
- 2) That this difference in associated features between multiple, single and no SSCs becomes non-significant after adjustment for depression, anxiety and general medical disorders.
- 3) That multiple somatic symptom complexes do not form an independent predictor of subsequent health status after adjustment for the effect of anxiety, depression, general medical illness and both somatic symptoms.

Hypotheses 1 and 2 were tested in a cross-sectional design and hypothesis 3 in a prospective design.

## 2. Methods

We conducted a population-based study in which we mailed 2985 baseline questionnaires to people aged 25–65 years registered at two general practices in North West England, one in an affluent rural area and one in a more deprived inner city area. Potential participants were selected from complete population lists (i.e. GP registers) using simple random sampling assuming that the sampled sub-group was representative of the population from which they were drawn (Fig. 1). The 2490 who were eligible to participate were sent a questionnaire that assessed the presence of chronic widespread pain, chronic fatigue irritable bowel syndrome and a number of potential associated factors (see below for details). Non-responders were sent a reminder postcard after two weeks and, if necessary, a further questionnaire after two further weeks.

Written informed consent was sought to examine participant's medical records. The medical record review identified any general medical illness that could explain the presence of pain or fatigue and also allowed us to count the number of consultations for the year before and year after questionnaire completion.

### 2.1. Definition of functional somatic symptom complexes

#### 2.1.1. Chronic widespread pain (CWP)

We used the definition of chronic widespread pain included in the American College of Rheumatology 1990 criteria for fibromyalgia [24]. Participants were asked to report the presence of any musculoskeletal pain they had experienced in the past month, whether their pain had persisted for three months or more, and to shade on a four-view blank body manikin the location(s) of their pain. Using these data, participants were classified as Chronic Widespread Pain if they reported pain, present for at least three months: above and below the waist, in the right and left hand sides of the body and in the axial skeleton.

#### 2.1.2. Chronic fatigue

The fatigue scale contains 11 items that inquire about symptoms of physical and mental fatigue. Individual items are scored 0 or 1, with a total score ranging from 0 to 11. Participants with fatigue scores of 4 or more on the Fatigue Scale [25] and who had reported symptoms for six months or more were classified as having chronic fatigue.

#### 2.1.3. Irritable bowel syndrome (IBS)

We identified those with IBS according to the Rome II criteria [26]. To fulfil these criteria participants had to report 3 months of continuous or recurring abdominal pain or discomfort and two of the following: (1) relief with a bowel movement, (2) be coupled with a change in frequency, or (3) be related to a change in the consistency of stools.

#### 2.1.4. Medical record review

For participants who had agreed, medical records were reviewed for 12 months before and after the date of baseline questionnaire by two raters (FC and CCG) to see if there was evidence of a recognised medical condition that could explain chronic fatigue, irritable bowel syndrome or chronic widespread pain. A conservative approach was used; any medical illness that could cause fatigue or widespread pain led to exclusion from the relevant functional somatic symptom complex classification; only those participants who reported the relevant symptoms but who did not have such a medical illness evident in the GP records were classified as having chronic fatigue, chronic widespread pain or irritable bowel.

### 2.2. Socio-demographic details

These included age, sex, marital status, current work status (including disability status), number of years of formal education and details of any outstanding compensation claims.

#### 2.2.1. Co-morbid general medical disorders

Respondents were asked if they had any common medical disorders on a checklist and to add any not listed. For analysis, participants were classified as having none, one, two or more general medical disorders.

#### 2.2.2. Symptom experience

The Somatic Symptom Inventory (SSI) asks respondents to rate 13 bodily symptoms on a 5-point scale as to “how much it has bothered you over the past 6 months?” The total score ranges from 13 to 65 with high scores indicating greater bother [27].

The Whitely index is a 14-item measure of health anxiety [28]. Each item is scored on a 5-point Likert scale, 1 = “not at all” to 5 = “a great deal.” The total score ranges from 14 to 70, with high values indicating greater health anxiety.

### 2.3. Childhood factors

The *Childhood Physical and Sexual Abuse questionnaire* consists of 8 questions concerning abuse [29]. Respondents were rated as having experienced childhood abuse if, before the age of 16 years, they

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