



Somatoform disorders and causal attributions in patients with suspected allergies: Do somatic causal attributions matter?[☆]

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Abstract

Objective: Somatic causal illness attributions are being considered as potential positive criteria for somatoform disorders (SFDs) in *DSM-V*. The aim of this study was to investigate whether patients diagnosed with SFDs tend towards a predominantly somatic attribution style. **Methods:** We compared the causal illness attributions of 48 SFD and 149 non-somatoform disorder patients, in a sample of patients presenting for an allergy diagnostic work-up, and those of 47 controls hospitalised for allergen-specific venom immunotherapy. The SFD diagnosis was established by means of the Structured Clinical Interview for DSM-IV. Both spontaneous and prompted causal illness attributions were recorded through interview and by means of the causal dimension of the Revised Illness Perception Questionnaire (IPQ-R), respectively.

Keywords: Allergy; Attribution style; Causal illness attributions; Positive criteria; Somatoform disorders

Patients' spontaneous and prompted responses were assigned to a psychosocial, somatic, or mixed attribution style. **Results:** Both in the free-response task and in their responses to the IPQ-R, SFD patients were no more likely than their nonsomatoform counterparts to focus on somatic explanations for their symptoms. They were just as likely to make psychosocial or mixed causal attributions. However, patients with SFDs were significantly more likely to find fault with medical care in the past. **Conclusion:** Our data do not support the use of somatic causal illness attributions as positive criteria for SFDs. They confirm the dynamic and multidimensional nature of causal illness attributions. Clinical implications of these findings are discussed.

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Introduction

In view of the forthcoming *Diagnostic and Statistical Manual for Mental Disorders (DSM-V)* and the *International Classification of Diseases (ICD-11)*, there is an ongoing debate about the terminology and classification of somatoform disorders (SFDs) [1–5]. There have been calls to move away from the ‘negative definition’ of SFDs as

‘medically unexplained’ towards a positive one, considering, among other things, somatic causal illness attributions as potential positive criteria [3,5–12]. Since the early 1990s, causal illness attributions have been shown to influence the development, maintenance, and management of somatoform and functional somatic syndromes [3,5,13–22]. The *ICD-10* already lists the adherence to somatic causal attributions as one of the main features of SFD patients [12]. However, empirical evidence of this assumption is relatively rare. Furthermore, variation in data collection methods and instruments, in data handling, and in the population studied certainly contributes to the heterogeneity of the findings (e.g., Refs. [23,24]): some studies support the notion of a tendency towards somatic illness attributions among SFD patients [25–28]. More recent studies and reviews [29–35] and, in particular, qualitative studies on doctor–patient interaction [36–38], however, present more of a mixed picture, with SFD patients being open to both somatic and psychosocial explanations of their symptoms.

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Attribution theory and research have identified three main (exclusive) dimensions of causal attribution, namely, psychosocial, organic, and normalising [25,39,40]. In addition, supporting the notion that illness attribution is a multidimensional process, with patients holding coexisting explanations for one and the same symptom or illness, factor analytic approaches based on the Illness Perception Questionnaire (IPQ) and its revised version (IPQ-R) have identified a number of attribution categories: psychological, risk factors, immunity, and chance factors [41–46]. Quantitative measures of illness attribution include lists of predetermined causal explanations from which patients can choose the one(s) closest to their own beliefs. This method assumes that the range of beliefs that are of interest are largely known [23]. On the contrary, qualitative studies allow patients to use concepts and categories that are relevant and meaningful to them. They have assessed attribution by simply asking patients what they attribute their symptoms to [19,32], by means of the more elaborate explanatory model interview [21,30], thematic content analysis of in-depth interviews [47], or transcripts of audiotaped consultations [36,37]. Similar to many of the quantitative studies, most of these analyses have focused on the dichotomy of psychosocial and somatic causal attributions.

The main purpose of this article was to assess the use of somatic causal attribution as a positive criterion of SFDs, with the long-term view to provide the basis for better diagnostic and therapeutic management. In particular, we aimed to test the hypothesis that SFD patients tend towards a predominantly somatic attribution style, combining and comparing both qualitative and quantitative research measures.

Method

This study is part of a larger cross-sectional study exploring potential positive criteria for SFDs [48]. In a sample of patients presenting for an allergy diagnostic work-up, we examined causal illness attributions of SFD and non-somatoform disorder (NoSFD) patients and those of their controls, hospitalised for allergen-specific immunotherapy (VIT). We compared patients' spontaneous and prompted causal attributions using both qualitative and quantitative research measures.

Participants

Three hundred consecutive patients admitted to the TUM allergy department were invited to participate in the study. Two hundred and forty-five were hospitalised for allergy testing (work-up patients). Their symptoms could not be diagnosed with sufficient certainty in an outpatient setting, or provocation testing was considered fraught with risk. Fifty-five patients already had an established diagnosis of hymenoptera (bee and wasp) venom allergy and were

admitted for allergen-specific venom immunotherapy (VIT). They were included in the study to control for possible effects of the work-up situation. Patients were recruited when they were aged 18–65 and had a good command of the German language. An 11-month study period was chosen to account for seasonal variations in the type of allergies presented.

Measures

Within the first 2 days of their stay in the clinic, all eligible patients were contacted by the research team. Patients giving informed consent were then interviewed by one of two board-certified psychiatrists (both certified SCID interviewers) and asked to fill in a set of self-report questionnaires. Two days following the interview, and prior to obtaining any medical test results, questionnaires were collected by the research team.

Interview

The interviewers emphasised that they were not members of staff and that they had no previous knowledge about the interviewee, thus attempting to create an atmosphere in which a discourse about the patients' experiences and thoughts about their health and previous contact with the health care system could freely develop.

First, patients' medical history, current symptoms and illnesses, and utilisation of health care services in the last 12 months were recorded. Then, patients' *spontaneous causal attributions* were explored. The main question asked was, 'What do you think is or are the causes of your current symptom(s) and/or intolerance(s)?' Responses were recorded verbatim.

The diagnosis of a SFD was ascertained using Section 'G' (somatoform disorders) of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I, German version), the current gold standard for the diagnosis of SFDs [49,50]. The SCID SFD diagnoses are based on a systematic review of organ systems and on the number, duration, and organic explicability of, as well as the impairment caused by, patients' symptoms. In addition, criteria for multisomatoform disorder [3,51] were applied. Patients who fully met criteria for a somatisation disorder, multisomatoform disorder, pain disorder, or undifferentiated SFD were identified as SFD patients. A primary SFD diagnosis was given to patients whose current and predominant symptom(s) could not be medically explained. The secondary SFD category was used to refer to patients suffering from a SFD, but whose *presenting* symptoms were medically explicable (e.g., a patient having had an anaphylactic reaction caused by analgesics and concurrently suffering from a somatoform pain disorder).

The modified causal attribution dimension of the IPQ-R

As part of a battery of self-report measures [48], the IPQ-R causal attribution scale (German version [52]) was

presented to the patients. The scale consists of a list of 18 ideas about the likely cause(s) of an illness. It was validated for eight organically defined and various somatoform illness groups [43,46]. The items are rated on a five-point Likert-type scale from *strongly disagree* to *strongly agree* (scored 1 to 5). The IPQ-R was designed to be flexible enough to be modified for use with a wide range of illnesses. It has demonstrated good construct and discriminant validity, internal, and test–retest reliability [43]. For the purpose of our study, the wording of instructions was slightly modified, replacing the word ‘illness’ with ‘allergy-suspect symptoms’. Due to the nature of our sample, the listing of 18 beliefs was extended by adding the item ‘allergy’. Based on feedback from a short pilot study, the original answer code ‘neither agree nor disagree’ was replaced by ‘partly agree’.

At the end of the battery of tests, information about patients’ age, sex, marital, and socioeconomic status was obtained by means of closed questions.

Data analysis

Interview

Similar to Korn [19] and Martin et al. [32], the open prose was coded independently by the first and senior author according to five dimensions (psychological, social, medical, health behavior, or ‘don’t know’). While each answer was placed into one category only, multiple mentions within the same category and across various categories were possible. In a second step, the above dimensions were collapsed into psychosocial (psychological and social), somatic (medical and health behavior), or mixed attributions. Patients reporting that they had ‘no idea’ as to what could be causing their symptoms were analysed separately.

IPQ-R causal scale

The percentages of participants endorsing individual causal items on the IPQ-R (i.e. corresponding to ‘partly’, ‘mostly’ or ‘fully agree’) were calculated. In line with our analysis of the qualitative data, we subsequently classified the IPQ-R items into psychosocial (Items 1, 9–12, 17; Table 3) and somatic causal attributions (remaining items). Patients’ spontaneous and prompted responses were assigned to a psychosocial, somatic, or mixed attribution style depending on whether they endorsed purely psychosocial, somatic, or psychosocial *and* somatic attributions.

Furthermore, to assess the relevance of the IPQ-R causal scale for our sample, for each patient holding specific beliefs about the etiology of their symptoms (i.e., excluding ‘don’t know’) we compared the cause(s) mentioned in the free-response task with their answer on the IPQ-R causal scale. That is, where the spontaneously mentioned causal attribution matched one of the 19 causal items of the IPQ-R, we checked whether the corresponding IPQ-R item had been ‘partly’, ‘mostly’, or ‘fully’ agreed to. Furthermore, we took note of items endorsed on the IPQ-R which had not previously been mentioned in the free-response task.

Statistics

All data were analysed using the Statistical Package for the Social Sciences (SPSS), version 16.0. Interrater reliability of the allocation of spontaneous causal attributions to the psychosocial–somatic divide was assessed with Cohen’s κ coefficient. Continuous variables were summarised using the mean and standard deviation. Absolute numbers and percentages were used to describe categorical variables. In terms of a hierarchical test procedure, comparisons across the three sample groups were followed by pair-wise comparisons where significant differences were found. One-way analyses of variance were applied to compare means between more than two independent samples, followed by pair-wise comparisons using independent *t* tests. Where the measurement variable did not meet the normality assumption, Kruskal–Wallis and Mann–Whitney *U* tests were used, respectively. To compare observed frequencies between patient subgroups we used the χ^2 test. Where sample sizes were small, Fisher’s Exact Test statistics are reported. Given the exploratory nature of our study, we carried out two-sided tests of significance at the .05 level.

Ethics

All procedures were performed as approved by the Institutional Review Board, Medical Faculty, TUM. Complete anonymity was assured.

Results

Participation, SFD diagnoses, and demographics

A total of 268 out of 300 patients meeting the inclusion criteria agreed to participate in the study. Eighty-nine percent of work-up patients (218/245; 72% women; mean age 43, S. D. 13.1) and 91% of VIT patients (50/55; 68% women; mean age 45, S.D. 10.9) agreed to take part.¹

In the work-up group, 69 (32%) out of 218 patients were diagnosed with a SFD [49,54]; 48 (22%) with a *primary* and 21 (10%) with a *secondary* SFD. None of the 50 VIT patients was diagnosed with a primary SFD; three (6%) were diagnosed with a secondary SFD, leaving us with a sample total of 244 patients. As we were interested foremost in patients’ current symptoms and their ideas about the likely causes thereof, the 24 patients with a secondary SFD were excluded from subsequent analyses.

SFD patients (*n*=48), NoSFD patients (*n*=149), and controls (*n*=47) were well matched for gender, age, number of concurrent somatic diagnoses, and duration of symptoms (Table 1 [48,53]).

¹ Reasons for nonparticipation were lack of interest in the study (*n*=19), being too busy (*n*=4), medical (*n*=2), and organisational problems (*n*=7). Participants and nonparticipants did not differ in terms of gender. However, nonparticipants were older (*P*=.03).

Table 1
Sociodemographics ($n=244$)

	Work-up group ($n=197$)		VIT ($n=47$)	<i>P</i>
	SFD ($n=48$)	NoSFD ($n=149$)		
Age in years, mean (S.D.)	43.0 (12.8)	43.2 (12.9)	43.1 (10.7)	.99 ^a
Sex, <i>n</i> (%)				
Male	9 (18.8)	47 (31.5)	16 (34.0)	.18 ^b
Female	39 (81.2)	102 (68.5)	31 (66.0)	
Duration of presenting symptoms (years), mean (S.D.)	8.8 (10.9)	5.9 (8.4)	6.1 (8.4)	.25 ^c
Number of current somatic diagnoses (other than allergy), <i>n</i> (%)				.24 ^d
0	27 (56.2)	73 (49.0)	32 (68.1)	
1–2	19 (39.6)	64 (43.0)	13 (27.7)	
≥3	2 (4.2)	12 (8.1)	2 (4.3)	
History of allergy				
Yes	22 (45.8)	73 (49.0)	17 (36.2)	.31 ^b
No	26 (54.2)	76 (51.0)	30 (63.8)	

^a *P* value of the one-way ANOVA.

^b *P* value of the χ^2 test.

^c *P* value of the Kruskal–Wallis test.

^d *P* value of the Fisher's Exact Test.

Spontaneous causal attributions

Out of the total sample, patients holding specific beliefs about the etiology of their symptoms ($n=163$) cited 234 causes altogether (mean 1.4, S.D. 0.7). Of these, 53 (mean 1.1, S.D. 0.3) were psychosocial and 181 (mean 1.3, S.D. 0.6) were somatic attributions. Examples of responses given and the categories they were assigned to are presented in [Appendix A](#). The level of agreement between raters was good (Cohen's $\kappa=0.89$). In case of discrepancies, they were discussed until agreement was reached. Eighty-one patients (33%) said that they had 'no idea' as to what could be causing their symptoms. While 22 patients (9%) exclusively mentioned (a) psychosocial cause(s) to explain their symptoms (psychosocial attribution style), 116 patients (48%) put forward purely somatic explanations (somatic attribution style). One in 10 ($n=25$) presented more of a mixed picture, making both psychosocial and somatic causal attributions (mixed attribution style).

The average number of spontaneously mentioned causes was 1.3 (S.D. 0.7) for SFD, 1.0 (S.D. 0.7) for NoSFD, and 1.2 (S.D. 0.6) for VIT patients, with no significant group differences [$F(2,160)=2.56$, $P=.08$]. The three sample groups (SFD, NoSFD, VIT) significantly differed in their attribution styles ($F=17.66$, $P=.007$). Two sample group comparisons revealed that these differences existed between both work-up groups (SFD, NoSFD) and VIT patients ($F=10.38$, $P=.01$; $F=13.78$, $P=.003$, respectively), but not between SFD and NoSFD patients ($\chi^2=3.73$, $df=3$, $P=.29$) ([Table 2](#)). SFD patients were no more likely than their nonsomatoform counterparts (NoSFD) to focus on somatic explanations for their symptoms. They were just as likely to advance psychosocial and/or mixed causes. Nevertheless, the somatic attribution style was the most common among both work-up groups.

Causal illness attributions according to the IPQ-R

Patients fully completing the IPQ-R ($n=222$) endorsed 1297 causes altogether (mean 5.8, S.D. 3.2). A mere two patients did not endorse any of the items of the IPQ-R. Most patients (86%) suspected their symptoms to be due to an allergy. Subsequently, the most frequently endorsed causal beliefs were 'altered immunity' (63.8%), 'pollution in the environment' (53.5%), and 'stress or worry' (52%). 'Accident or injury' (6.1%), 'alcohol' (6.6%), 'smoking' (9.6%), 'my mental attitude' (10.9%), 'my personality' (13.1%), and 'aging' (17%) were least likely to be seen as possible causes of patients' symptoms.

The average number of endorsed items was 6.2 (S.D. 3.2) for SFD, 6.1 (S.D. 3.3) for NoSFD, and 4.8 (S.D. 2.9) for VIT patients, with no significant group differences [$F(2,219)=2.65$, $P=.07$]. [Table 3](#) illustrates the extent to which SFD ($n=44$), NoSFD ($n=140$), and VIT patients ($n=45$) endorsed the individual causal belief items of the IPQ-R. The three groups differed significantly with regard to their subscription to a number of causal items (Items 1, 4, 5, 6, 10). Two sample group comparisons revealed that a

Table 2
SFD and attribution style (spontaneous) ($n=244$)

Attribution style	Work-up group ($n=197$)		VIT ^{a,b} ($n=47$)	<i>P</i>
	SFD ^{a,b} ($n=48$)	NoSFD ^{a,b} ($n=149$)		
Somatic	26 (54.2)	61 (40.9)	29 (61.7)	.007 ^c
Mixed	7 (14.6)	18 (12.1)	—	
Psychosocial	4 (8.3)	17 (11.4)	1 (2.1)	
'No idea'	11 (22.9)	53 (35.6)	17 (36.2)	

Values are shown as *n* (%).

^{a,b} Denote pairs of groups different at the .05 level. ^c *P* value of the Fisher's Exact Test.

Table 3

Comparison of causal items endorsed on the IPQ-R by SFD, NoSFD, and VIT patients (n=229)

IPQ-R causal items	Work-up group (n=184)		VIT (n=45) **	P (χ^2 test)
	SFD (n=44) **	NoSFD (n=140) **		
1. Stress or worry	26 (59.1) ^a	82 (58.6) ^b	11 (24.4) ^{a,b}	<.001
2. Hereditary – it runs in my family	10 (22.7)	39 (27.9)	10 (22.2)	.66
3. Germs or viruses	13 (29.5)	34 (24.3)	6 (13.3)	.17
4. Diet or eating habits	22 (50.0) ^a	64 (45.7) ^b	8 (17.8) ^{a,b}	.002
5. Chance or bad luck	17 (38.6) ^a	54 (38.6) ^b	30 (68.2) ^{a,b}	.002
6. Poor medical care in my past	16 (36.4) ^a	27 (19.3) ^{a,b}	2 (4.4) ^{a,b}	.001
7. Pollution in the environment	22 (51.2)	71 (50.7)	29 (64.4)	.26
8. My own behaviour	13 (29.5)	47 (33.6)	8 (17.8)	.13
9. My mental attitude e.g., thinking about life negatively	4 (9.1)	17 (12.1)	4 (8.9)	.87 *
10. Family problems or worries caused my illness	11 (25.0) ^a	40 (28.6) ^b	4 (8.9) ^{a,b}	<.05
11. Overwork	15 (34.1)	48 (34.8)	8 (17.8)	.09
12. My emotional state, e.g., feeling down, lonely, anxious, empty	11 (25.0) ^a	36 (25.9) ^b	4 (8.9) ^{a,b}	.05
13. Ageing	8 (18.2)	25 (17.9)	6 (13.3)	.76
14. Alcohol	1 (2.3)	12 (8.6)	2 (4.4)	.34 *
15. Smoking	3 (6.8)	14 (10.0)	5 (11.1)	.82 *
16. Accident or injury	4 (9.1)	9 (6.4)	1 (2.3)	.39
17. My personality	6 (13.6)	20 (14.3)	4 (8.9)	.64
18. Altered immunity	28 (63.6)	88 (62.9)	30 (66.7)	.90
19. Allergy	38 (86.4)	116 (82.9)	43 (95.6)	.10

^{a,b}Denote pairs of groups different at the .05 level (χ^2 test).

Values are shown as n (%).

* P value (two-tailed significance) of the Fisher's Exact Test.

** n slightly varies from item to item. Analyses include all patients (fully or partly) completing the questionnaire.

significant difference between SFD and NoSFD patients existed only for Item 6. That is, SFD patients were significantly more likely than NoSFD patients to view 'poor medical care in the past' as a possible cause of their symptoms ($\chi^2=5.45$, $df=1$, $P=.001$).

Attribution style

Of the 1297 items endorsed altogether, 349 (mean 1.5, S. D. 1.8) were psychosocial and 950 (mean 4.3, S.D. 2.1) were somatic attribution items.

The following analyses only include patients who fully completed the IPQ-R and endorsed at least one of the items on the list ($n=220$). None of the patients displayed a purely psychosocial attribution style, and 44% ($n=97$) endorsed only somatic attribution items (somatic attribution style). The majority (56%, $n=123$) exhibited a mixed attribution style, endorsing both psychosocial and somatic causal attributions.

Table 4

Attribution style according to the IPQ-R ($n=220$)

IPQ-R attribution style	SFD (n=43)	NoSFD (n=134)	VIT (n=43)
Somatic	17 (39.5) ^a	50 (37.3) ^b	30 (69.8) ^{a,b}
Mixed	26 (60.5) ^a	84 (62.7) ^b	13 (30.2) ^{a,b}
Psychosocial	–	–	–

Values are shown as n (%).

^{a,b}Denote pairs of groups different at the .05 level (χ^2 test).

Our three sample groups (SFD, NoSFD, VIT) significantly differed in their attribution style ($\chi^2=14.36$, $df=2$, $P=.001$). Two sample group comparisons revealed that these differences existed between work-up group (SFD, NoSFD) and VIT patients, but not between SFD and NoSFD patients (Table 4). VIT patients were significantly more likely to exhibit a somatic attribution style. SFD patients were no more likely than NoSFD patients to focus on somatic explanations for their symptoms ($\chi^2=0.07$, $df=1$, $P=.79$). They were just as likely as NoSFD patients to display a mixed attribution style. In fact, in both work-up groups the mixed attribution style was most prevalent. Analyses with the item 'allergy' deleted produced similar results (details not shown).

Comparison of causal attributions and attribution style in the free-response task and on the IPQ-R

Overall, 62% of spontaneous mentions corresponded to a particular IPQ-R item. The majority (81%) of these were subsequently also endorsed on the IPQ-R causal scale. About one third of spontaneous mentions (36%)² were not classifiable under an IPQ-R causal item. Furthermore,

² The percentages of spontaneous mentions corresponding to an IPQ-R item (62%) and of those not corresponding to an IPQ-R item (36%) do not add up to a total of 100% as some statements made in the free-response task were considered to be examples of the same IPQ-R item.

Table 5
Attribution style according to the IPQ-R ($n=220$)

IPQ-R Spontaneous		Somatic	Mixed
Somatic	SFD ($n=23$)	11 (47.8)	12 (52.2)
	NoSFD ($n=54$)	30 (55.6)	24 (44.4)
	VIT ($n=25$)	18 (72.0)	7 (28.0)
	Total ($n=102$)	59 (57.8)	43 (42.2)
Mixed	SFD ($n=7$)	1 (14.3)	6 (85.7)
	NoSFD ($n=16$)	1 (6.3)	15 (93.8)
	VIT	–	–
	Total ($n=23$)	2 (8.7)	21 (91.3)
Psychosocial	SFD ($n=4$)	2 (50.0)	2 (50.0)
	NoSFD ($n=13$)	–	13 (100.0)
	VIT ($n=1$)	–	1 (100.0)
	Total ($n=18$)	2 (11.1)	16 (88.9)
'No idea'	SFD ($n=9$)	3 (33.3)	6 (66.7)
	NoSFD ($n=51$)	19 (37.3)	32 (62.7)
	VIT ($n=17$)	12 (70.6)	5 (29.4)
	Total ($n=77$)	34 (42.2)	43 (55.8)

Values are shown as n (%).

some causal attribution items of the IPQ-R (namely, 'accident or injury', 'alcohol', 'my mental attitude', 'my personality', and 'aging') had not been mentioned in the free-response task at all. On the IPQ-R, these items were least likely to have been endorsed (Table 3). Patients who had reported that they had 'no idea' as to what was causing their symptoms in the free-response task ($n=81$) subsequently exhibited a pattern of individual causal attributions on the IPQ-R similar to that of the other patients (details not shown). The majority (55.8%) of these patients displayed a mixed attribution style (Table 5).

About half of SFD (52.2%) and NoSFD (44.4%) patients exhibiting a purely somatic attribution style in the free-response task shifted to a multidimensional, mixed attribution style, when presented with a predetermined list of causal attribution items (Table 5). Furthermore, half of SFD patients and all NoSFD patients providing purely psychosocial explanations for their symptoms in the free-response task subsequently moved to a mixed attribution style. A minority of patients (14.3% of SFD, 6.3% of NoSFD patients) shifted from a multidimensional to a purely somatic attribution style.

Discussion

Somatic illness attribution revisited

In both the qualitative and quantitative measures of causal illness attribution, SFD patients were no more likely than NoSFD patients to focus on somatic explanations for their symptoms. They were just as likely to advance psychosocial or mixed causes. Our results thus challenge the assumption that SFD patients hold on to a purely somatic explanatory model. They are consistent with recent qualitative research which suggests that SFD patients do incorporate psychoso-

cial factors in their explanations for their symptoms when they are encouraged to do so [36–38,54]. Both in the free-response task and on the IPQ-R, the majority of work-up patients (SFD, NoSFD) endorsed multiple illness attributions, including psychosocial ones. Our results thus confirm the view that symptom attribution is a multidimensional process, with patients holding multifaceted and coexisting explanations for their symptom(s) [33,38,41,47]. The similarity in attribution styles and the predominance of mixed attributions among both SFD and NoSFD patients further illustrate that patients are generally open to a bio-psycho-social illness model, in particular in a work-up situation.

The shift between various attribution styles confirms the dynamic nature of the attribution process. According to Leventhal et al. [55], the search for the meaning of an illness is a process characterised by movement and uncertainty: in seeking meaning for the symptoms they experience, patients may hold on to a variety of explanations simultaneously or move from one belief to another.

Dissatisfaction with medical care

In our study, SFD patients expressed considerable dissatisfaction with medical care received in the past. This was the only causal illness attribution significantly differentiating SFD from NoSFD and VIT patients. This finding confirms results of some earlier studies [48,56–58] and may reflect the prominence of interpersonal factors in the management of SFD patients. Although the cause of dissatisfaction with medical care was not elicited, it may in some cases have involved disagreement over attribution and the legitimacy of patients' symptoms [36]. In fact, recent studies on the management of SFD patients have increasingly focused on the doctor–patient interaction rather than on SFD patients' psychopathology [22,36–38].

Spontaneous and prompted causal attributions

Patients' spontaneous causal attributions corresponded well to their subsequent answers on the IPQ-R. However, the relevance of the IPQ-R items to our study population seems limited, with more than one third of spontaneous mentions not classifiable under an IPQ-R causal item. Conversely, patients who had spontaneously reported that they had 'no idea' as to what was causing their symptoms had later on exhibited a pattern of causal attribution similar to that of the other patients.

As the IPQ-R was embedded in a batch of self-report instruments, exploring health-related cognitive, affective, and behavioral characteristics, this may have contributed to some patients' disclosure of psychosocial causal attributions. In contrast, the predominance of somatic attribution items in the IPQ-R may have influenced patients initially exhibiting a purely psychosocial attribution style to also endorse one or more somatic causal attributions.

Nevertheless, the use of a questionnaire could be a useful and complementary tool in clinical consultations as it may help to engage some patients in further discussions about their symptoms.

Causal attribution, depression, and anxiety

A tendency towards psychosocial and mixed causal attributions in SFD patients has been shown to be associated with concurrent depression and anxiety disorders [21,41,59,60]. Our SFD patients have been reported to score significantly higher on measures of depression and anxiety than their nonsomatoform counterparts [48]. Separate analyses (details not shown) revealed a significant positive relationship between a mixed attribution style and depression and anxiety scores. However, given the considerable syndrome overlap of somatisation, depression, and anxiety [59,61,62], and the view of these disorders as essential dimensions of SFDs, the above does not detract from the importance of our results.

Clinical implications

Risør [47] has shown that causal illness attributions are dependent on the social situation and on whom the ‘illness story’ is being told to: while in clinical encounters, patients tended to focus on somatic illness attributions, these were by no means the only explanations of significance to them. In fact, where a safe place was provided in which patients felt listened to and understood, they have been shown to be able to disclose psychological factors [29,30,32,63]. The fact that our interviewers had made it very clear that they were not members of hospital staff and that the interview was not to be seen as a medical consultation undoubtedly created an atmosphere in which a discourse about the patients’ thoughts could more freely develop. Barriers to patient disclosure of emotional issues generally found in clinical consultations [54] may thus have been overcome.

In fact, cognitive behavioral interventions [22,64,65], psychodynamic interpersonal therapy [66], and, most importantly, improved communication between doctors and patients [29,36,54,67–69] have been shown to be most effective in the management of SFDs.

Strengths and limitations

A strength of our study is the high participation rate and thus the lack of attrition bias. Secondly, SFD, NoSFD patients, and controls were well matched for gender, age, number of concurrent somatic diagnoses, and duration of current symptoms. Thirdly, the diagnosis of SFD was established using the SCID, the current gold standard for SFD diagnosis. Finally, the inclusion of both qualitative and quantitative measures has identified the multidimensional and changing nature of causal illness attributions.

Limitations of our study include the fact that the latter was carried out in an allergology setting which limits the generalisability of our findings. The psychological burden of the work-up situation may have been influencing the attributions of both SFD and NoSFD patients [48]. Secondly, it is a cross-sectional study, so no inferences can be made regarding the causal nature of or the influence of certain events or factors on patients’ cognitions. Thirdly, while the IPQ-R items were rated on five-point Likert-type scales, the small number of subjects in each response category precluded a separate and more graded analysis of patients’ attributions. Fourthly, we acknowledge that the categorisation of attributions according to the dualistic psychosocial–somatic divide may be problematic [70], all the more considering current efforts to get away from the mind–body dichotomy inherent in the prevailing SFD classification. However, this categorisation allowed for the comparison of the qualitative and quantitative measures used in this study, the comparison with previous studies, and for addressing our main research questions. Furthermore, while allowing for a mixed attribution category, patients were not confined to two mutually exclusive attribution styles.

Most importantly, time of interview and setting undoubtedly influenced our results. Thoughts about the etiology of an illness have been shown to vary during its course, with patients tending to rely on somatic explanations in the early stages of medically unexplained symptoms [47], the interaction with significant others influencing the development of these thoughts [71]. Our patients have had a relatively long history of symptoms (Table 1) and thus ample opportunity of structuring and restructuring their etiological thoughts.

Conclusions

Contrary to the widespread assumption that SFD patients do not recognise the role of psychosocial factors in the development of their symptoms, most of our patients did. There were no differences between SFD and NoSFD patients in this respect. Our results thus suggest that, due to their lack of specificity, somatic causal attribution should not be used as a positive criterion for future classifications. However, this does not preclude the importance of addressing somatic causal attributions in the management of SFDs. Our findings confirm the view that the process of illness attribution is a dynamic and multidimensional process, and point to the importance of the doctor–patient interaction.

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Appendix A

Classification of spontaneous causal attributions

Categories	Spontaneous causal attributions
Psychosocial	
Psychological	Mental; emotional sensitivity; anxiety; my emotional state (e.g., feeling lonely, anxious, empty); anxiety; psychological factors; cursed by my deceased father; psychosomatic
Social	Stress or worry (as a child, at home, at work, at school, marriage, caring for a relative, bereavement); family drama; lack of work–life balance; burnout; the last straw; feeling overburdened
Somatic	
Biological/medical	Allergies (to medication, antibiotics, analgesics; dairy products, latex, fish, nickel, pollen, various allergens, wasps, products in the house); too many insect stings; mastocytosis; too many antibiotics (as a child); body can't cope with too much medication; heart tablets; wrong homeopathic remedies; hypersensitivity; the sun; food intolerance; additives; hereditary/runs in the family/disposition/genetic; disease of civilisation; poor general condition; COPD; hyperthyroidism; internal organ failure; related to mucosa frailty; pollution in the environment; climate; chemicals/noxa (disinfectant, chlorine, dye; additives, multiple chemical sensitivity); dental filling; amalgam; palladium; nickel; vaccine; altered immunity; acne inversa; hypersensitivity to adrenaline; immune-mediated disease; gastrointestinal problems; stasis dermatitis; polyarthritis; appendectomy; radiotherapy; autoimmune disease; hyperthyroidism; cardiovascular system; thyroidectomy; infection; malfunctioning digestive system; hormones; acupuncture; new apartment; side-effects from operation; germs or viruses; chlamydia; animals/germs are changing; since contracted scabies on a holiday in Costa Rica; Epstein–Barr virus; climate; wind
Health behavior	Diet/eating habits; alcohol; lack of exercise; nicotine
'No idea'	Don't know; no idea; chance

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