Original Paper

Psychopathology

Psychopathology 2011;44:283–288
DOI: 10.1159/000322795

Received: February 5, 2010
Accepted after revision: November 8, 2010
Published online: June 9, 2011

Magical Thinking in Somatoform Disorders: An Exploratory Study among Patients with Suspected Allergies

C. Hausteiner-Wiehle F. Sokollu

Department of Psychosomatic Medicine and Psychotherapy, Technische Universität München (TUM), Munich, Germany

Key Words
Magical thinking · Somatoform disorders · Allergy

Abstract
Background: In order to reconceptualize somatoform disorders (SFDs), the psychological characteristics of SFD patients are increasingly investigated. The cognitive style of magical thinking (MT) has not been studied so far in patients with SFDs. ***Sampling and Methods:*** In a cross-sectional study, 201 allergy workup patients were interviewed using the Structured Clinical Interview for DSM-IV; they answered a set of self-report questionnaires including the Schizotypal Personality Questionnaire subscale for MT and the Patient Health Questionnaire (PHQ). The expression of MT was explored in 61 patients with SFDs compared to 140 patients without SFDs. ***Results:*** Patients with SFDs reached higher scores of MT, also when controlled for gender, depression, and anxiety. In particular, they stated more frequently that they were believers in telepathy (64 vs. 44%) and clairvoyance (43 vs. 16%). MT correlated only weakly with somatization/somatic symptom severity, depression, and anxiety. ***Conclusions:*** Among allergy workup patients with SFDs we found considerable MT. This indicates that SFD patients may tend to mistake correlation for causality in a more general way, and not just in an illness-related context. The relation to indicators of illness severity (somatic symptom severity/somatization, depression, and anxiety) was relatively weak. Possible implications for research, diagnostics, and therapy are discussed.

Introduction

In view of a reconceptualization of somatoform disorders (SFDs), recent research has focused on the psychological characteristics of SFD patients: important cognitive dimensions of SFDs include, for example, the patients' reasoning about possible causes of their symptoms, or possible ways to control them, and decreased reassurance by medical findings [1–7].

In contrast to illness-related reasoning, *magical thinking* (MT) is a more general form of causal reasoning that includes mistaking *correlation* for *causation*, or believing in paranormal, invalid forms of causation such as the ability of the mind to affect the physical world [8, 9]. It is debated whether females have higher scores of MT than males [10–14]. Several studies describe an association of paranormal beliefs and stress or trauma [15–17]. Further, an association of MT with mixed handedness and hyperacusis is being discussed [18–20]. MT has been shown to be a characteristic of several conditions with disturbed

KARGER

Fax +41 61 306 12 34
E-Mail karger@karger.ch
www.karger.com

0254–4962/11/0445–0283$38.00/0

Accessible online at:
www.karger.com/psp

PD Dr. med. Constanze Hausteiner-Wiehle
Klinik und Poliklinik für Psychosomatische Medizin und Psychotherapie
Technische Universität München, Klinikum rechts der Isar
DE–81664 München (Germany)
Tel. +49 89 4140 4313, Fax +49 89 4140 4845, E-Mail c.hausteiner@lrz.tum.de

reasoning as a prominent feature, such as psychosis, delusional disorder, schizotypy and obsessive-compulsive disorder [21–24]. These entities are relatively rare comorbidities in SFDs [25–27], but a report about considerable MT in patients with dental anxiety [28] indicates that MT is not restricted to them.

Even if there are sporadic reports about an association between MT, paranormal beliefs, out-of-body experiences, and proneness to (somatoform) dissociation [29–31], we are not aware of any studies looking at the association between MT and somatization (i.e. the tendency to experience and communicate somatic distress) or SFDs. For the following reasons, MT may predispose to or be a defining feature of SFDs: patients with somatoform syndromes (e.g. multiple chemical sensitivities, fibromyalgia syndrome, or other pain syndromes) regularly seek alternative treatments such as prayer and distant healing, and strongly believe in their efficacy [32–35]. Many patients are convinced that they have a severe illness and some cling on to organic causal beliefs in the face of negative test results [4, 36].

Therefore, the aim of this study was to explore the expression of MT in patients with and without SFDs in a sample of allergy workup patients.

Methods

Patients and Procedures

Between January and November 2007, all patients who were admitted for a diagnostic allergy workup as inpatients to the Department of Dermatology and Allergy, TUM, were asked to participate in a cross-sectional study on attitudes towards bodily symptoms [4]. The only inclusion criteria were bodily symptoms that were attributed to allergies by the patients themselves. We excluded patients under 18 and over 65 years and those who were unable to cooperate, for example due to insufficient command of the German language, dementia or acute psychosis. Informed consent was obtained and patients were interviewed using the Structured Clinical Interview for DSM-IV (SCID-I, including section G of the interview [37], supplemented with the criteria for multisomatoform disorder by Kroenke et al. [38]). They completed a large set of self-rating questionnaires, including three modules of the established Patient Health Questionnaire (PHQ-15 for somatization, PHQ-9 for depression, and GAD-7 for anxiety [39–42]) and the subscale 'odd beliefs/magical thinking' of the Schizotypal Personality Questionnaire (SPQ [43, 44]). The SPQ scale lists seven statements about MT that can be either approved ('yes' = 1) or denied ('no' = 0), and that sum up to an MT score, ranging between 0 and 7 (table 2).

To establish or reject an SFD diagnosis (somatization/multisomatoform disorder, pain disorder, or undifferentiated SFD) at the end of the workup, we took into account both the SCID diagnosis and the allergists' rating of a patient's symptoms in terms of organic explicability.

All further analyses compared patients with ('SFD') and without an SFD ('NoSFD'). For details about patients and procedures see Hausteiner et al. [4].

Statistical Analysis

Statistical analyses were carried out with SPSS (version 18.0). Data were analyzed descriptively reporting absolute numbers and percentages for categorical variables and median and quartiles for continuous variables. Comparisons of frequencies concerning sociodemographic variables were performed by χ^2 tests, subgroup differences concerning continuous variables were compared by Mann-Whitney U tests.

To assess the relationship between relevant psychopathological dimensions and MT, Spearman's correlation coefficient was computed between MT, somatization/somatic symptom severity, depression, and anxiety. Further, a binary logistic regression analysis (enter method, dependent variable: presence of an SFD, yes = 1 or no = 0) was applied to assess group differences in MT independent of possible confounders.

Due to the explanatory nature of the investigations performed, p values were used as statistical measures of distance or relationship and do not have the ordinary hypothesis confirmatory capability. We refrained from alpha adjustment, but minimized the number of tests carried out so as to avoid the risks of multiple testing.

Results

Participation Rate, Prevalence of SFDs, and Sociodemographic Profile

Two hundred and forty-five patients were included in the study, 218 patients agreed to participate, and 201 patients fully completed the questionnaires (participation rate 82%). Sixty-one patients (30%) were diagnosed with an SFD according to SCID. The sociodemographic profiles of SFD and NoSFD patients as well as their self-reported handedness were comparable. There were, however, 10% more women in the SFD group, making gender a possible confounder of subsequent results, even if the difference was not statistically significant (79 vs. 69%, table 1).

MT and Its Relation to Somatic Symptom Severity/Somatization, Depression, Anxiety, and Gender

SFD patients displayed more MT than NoSFD patients ($p = 0.001$). They endorsed most of the MT scale's items more often than NoSFD patients; the item most frequently endorsed by SFD patients was the belief in *telepathy* (64 vs. 44%; $p = 0.009$); the biggest difference existed with regard to the belief in *clairvoyance* (43 vs. 16%; $p < 0.001$, table 2). Seventy-four percent of the SFD patients and 57% of the NoSFD patients endorsed at least one of the items on the SPQ MT subscale. Eighteen percent of the SFD

patients and 9% of the NoSFD patients endorsed 5 or more items. SFD patients scored significantly higher on the PHQ-15 ($p < 0.001$), the PHQ-9 ($p < 0.001$) and the GAD-7 ($p < 0.001$, table 2).

Scores on the SPQ subscale MT correlated weakly with scores on the PHQ-15, the PHQ-9, and the GAD-7 (r = 0.25–0.28). The PHQ-15, PHQ-9, and GAD-7 were moderately correlated (r = 0.50–0.70). Separate analysis of MT scores in the three different SFD subtypes (somatization/multisomatoform disorder, pain disorder, undifferentiated SFD) revealed no relevant differences (details not shown).

Considering the potential confounders depression, anxiety, and gender, binary logistic regression analysis revealed a somewhat increased likelihood for patients with increased MT scores to belong to the SFD group (20% for every 1-point increase on the SPQ MT subscale, table 3).

Table 1. Sociodemographic profile and handedness in 201 allergy workup patients with versus without SFDs

	SFD (n = 61)	NoSFD (n = 140)	p
Age, years[1]	42 (33–54)	45 (33–54)	0.63
Female sex[2]	48 (79%)	97 (69%)	0.17
Handedness[2]			0.85
Right	56 (92%)	125 (89%)	
Left	2 (3%)	7 (5%)	
Mixed	2 (3%)	5 (4%)	
No answer	1 (2%)	3 (2%)	
Currently living with a partner[2]			0.77
Yes	46 (75%)	106 (76%)	
No	12 (20%)	31 (22%)	
No answer	3 (5%)	3 (2%)	
School years[2]			0.34
≤11 years	26 (43%)	49 (35%)	
≥12 years	33 (54%)	84 (60%)	
No answer	2 (3%)	7 (5%)	
Currently employed[2]			0.17
Yes	50 (82%)	123 (88%)	
No	11 (18%)	15 (11%)	
No answer	0	2 (1%)	

SFD = Patients with a somatoform diagnosis according to SCID I/criteria for multisomatoform disorder; NoSFD = patients without a somatoform diagnosis according to SCID I/criteria for multisomatoform disorder.

[1] Median (quartiles) and p value of Mann-Whitney U test.

[2] Number (percent) and p value of χ^2 test.

Discussion

To our knowledge, this is the first study to investigate MT in patients with SFDs. Despite some methodological shortcomings due to the exploratory nature of the study we were able to show that – in an allergy workup setting – patients with SFDs displayed significantly more MT than their NoSFD counterparts. In particular, they much more frequently stated that they were believers in clairvoyance and telepathy. After correcting for depression, anxiety, and gender, MT scores were still higher in SFD than in NoSFD patients. MT weakly correlated with somatic symptom severity/somatization, depression, and anxiety, indicating only a weak relation between MT and illness severity.

There are sporadic reports on high absorption (a personality trait predisposing to the deep immersion in sensory or mystical experiences) in patients with multiple chemical sensitivities, high hypnotizability/(hypnotic) suggestibility in patients with nonepileptic seizures, conversion disorder, and chronic fatigue syndrome [45–48]. Brown et al. [49] studied suggestibility in a small group of patients with somatization disorder, finding scores comparable to those of patients with dystonia. But the relation between MT and these concepts is not clear, as there may be fundamental differences between MT (i.e. the belief in psychic abilities and paranormal forms of causation) and the ability to enter certain psychic states (e.g. absorption or hypnotizability).

Further, we are not aware of any literature discussing the role of MT in the development or maintenance of SFDs. Yet, the association of both MT *and* somatization with dissociation and trauma nourishes assumptions about MT and somatization both being sequelae of severely unsettling and disintegrating experiences [15–17, 28–31, 50].

Diagnostic and Therapeutic Implications

At this point in time, diagnostic as well as therapeutic consequences of our findings can only be speculative.

Even if subsequent research confirms our findings, raised MT cannot be used as a clinical criterion for the early detection of SFDs. To begin with, MT is not specific to SFDs; it is quite common in the general population: about every third American believes in haunted houses or clairvoyance, and 41% of British citizens believe in telepathy, 28% in psychics/mediums, and 18% in fortune telling/tarot [14, 51, 52]. As stated above, MT is particularly prominent in several psychiatric conditions [21–24]. Accordingly, currently available instruments for the assessment of MT are tailored to schizotypy and psy-

Table 2. Raw scores/percentages of the SPQ subscale for MT, the PHQ-15, the PHQ-9, and the GAD-7 in 201 allergy workup patients with versus without SFDs

	Score min–max	SFD (n = 61)	NoSFD (n = 140)
SPQ subscale odd beliefs/MT[1]	min 0–max 7	2.0 (0.25–4.0)	1.0 (0.0–3.0)
Have you had experiences with the supernatural?[2]	no 0–yes 1	20 (33%)	30 (21%)
Do you believe in telepathy (mind reading)?[2]	no 0–yes 1	39 (64%)	61 (44%)
Are you sometimes sure that other people can tell what you are thinking?[2]	no 0–yes 1	14 (23%)	25 (28%)
Do you believe in clairvoyance (psychic forces, fortune telling)?[2]	no 0–yes 1	26 (43%)	23 (16%)
Can other people feel your feelings when they are not there?[2]	no 0–yes 1	14 (23%)	16 (11%)
Have you had experiences with astrology, seeing the future, UFOs, ESP or a sixth sense?[2]	no 0–yes 1	20 (33%)	30 (21%)
Have you ever felt that you are communicating with another person telepathically (by mind reading)?[2]	no 0–yes 1	18 (30%)	23 (16%)
Somatization/somatic symptom severity (PHQ-15)[1]	min 0–max 28/30 (males/females)	11.0 (8.5–14.0)	6.0 (3.0–8.0)
Depression (PHQ-9)[1]	min 0–max 27	8.0 (5.0–10.0)	3.0 (2.0–6.0)
Anxiety (GAD-7)[1]	min 0–max 21	4.0 (3.0–7.0)	3.0 (2.0–5.0)

SFD = Patients with a somatoform diagnosis according to SCID I/criteria for multisomatoform disorder; NoSFD = patients without a somatoform diagnosis according to SCID I.

[1] Median (quartiles).

[2] Number (percentage) of patients answering 'yes'.

Table 3. MT and potential confounders in 201 allergy workup patients with versus without somatoform disorders (logistic regression analysis)

	β	d.f.	p	OR (CI)
SPQ MT	0.20	1	0.05	1.22 (1.01–1.48)
PHQ-9	0.44	1	<0.001	1.55 (1.32–1.83)
GAD-7	–0.18	1	0.06	0.84 (0.70–1.01)
Female gender	0.45	1	0.30	1.56 (0.67–3.64)
Constant	3.31	1	<0.001	0.04

GAD = Generalized Anxiety Disorder; d.f. = degrees of freedom; OR = odds ratio; CI = confidence interval.

chotic disorders and may be inappropriate for use with SFD patients. In particular, seemingly 'absurd' questions (such as: 'Can other people feel your feelings when they are not there?') can hardly be part of diagnostic routine, at least in a 'somatic' setting.

However, MT may be relevant in the management of SFDs: even if we are not aware of any literature on MT as a possible therapeutic hindrance, it might complicate, for example, cognitive psychotherapeutic approaches (such as cognitive restructuring or problem solving), or contribute to turning away from academic medicine.

On the other hand, MT can increase therapeutic chances: MT may make a subgroup of patients more accessible to imaginative techniques or hypnosis, which have been shown to be helpful for patients with various somatoform conditions [53, 54]. In a randomized controlled partially blinded trial about the effectiveness of distant healing for patients with chronic fatigue syndrome, Walach et al. [55] reported that it was not the distant healing itself but the expectation of improvement that improved outcome. There are nonblinded trials about the effect of spiritual healing on SFDs and various chronic bodily symptoms that can be interpreted in a similar way [56–58]. Further, patients with chronic fatigue syndrome, fibromyalgia syndrome or other functional somatic syndromes reach considerable placebo response rates, also indicating remarkable power of mental functions over bodily symptoms in these patients [59–61].

Study Limitations and Implications for Future Research

Above all, this analysis is part of a larger study focusing on other psychological characteristics of SFD [4]. The findings on MT are based on a single self-administered scale, which was embedded in a large set of other questionnaires. Thus, the results have to be interpreted with caution, and our findings should be challenged in studies

using *several* ways to assess MT, ideally including experimental approaches.

Second, inpatients of a university-based allergy department may not be representative of 'typical allergy' or 'typical SFD' patients, limiting the generalizability of our findings. After consolidation of the new DSM-V classification of SFDs [6], the question should be addressed whether MT is limited to certain subgroups of SFD patients (e.g. those with a polysymptomatic course, somatic symptom attributions, hypochondriac fears, or distinct comorbidity).

Third, because the study design was cross-sectional, directionality cannot be assessed. On the one hand, MT can be considered a stable trait [20, 39, 40] and very unlikely constitutes a *consequence* of SFDs. On the other hand, MT can be used to restore a sense of control and safety in situations of danger and helplessness [17, 41, 42]. Thus, it could also be a *reaction* to stress, trauma, or the symptoms themselves. The role of MT in the development or maintenance of SFDs as well as its therapeutic potential should be further investigated.

Conclusions

Despite inconsistencies between medical findings and subjective symptoms, many patients with SFDs are convinced that they are suffering from a severe illness, and pin their hopes on alternative treatments. A disposition towards MT, at least in a subgroup of patients, would indicate a *general* tendency to mistake correlation for causation, to favor paranormal causal beliefs and erroneous conclusions. While routine assessment of MT may not be feasible in most clinical settings, a tendency towards MT could be a small but relevant aspect in the management of SFDs.

If our preliminary finding of increased MT in patients with SFDs can be confirmed, future research will have to address the following questions: firstly, how are MT and somatization related? Secondly, do the conflicting (delusive?) beliefs of magical thinkers add to the high subjective functional impairment and dysfunctional help-seeking behavior that are so typical of SFDs? And finally, do beliefs in psychic abilities have therapeutic potential?

Acknowledgments

We are especially grateful to the entire staff of the Department of Dermatology and Allergy (TUM) for excellent cooperation, to Prof. P. Henningsen and Prof. D. Huber as the supervisors of the study, to Dr. S. Bornschein, Department of Psychiatry and Psychotherapy (TUM), for her help with data collection, to S. Groben for English language support, and to Dr. T. Schuster, Institute for Medical Statistics and Epidemiology (TUM) for statistical advice. The study has been funded by a grant from the Committee for Clinical Research (KKF) of the Medical Faculty, TUM.

References

1 Rief W, Sharpe M: Somatoform disorders: new approaches to classification, conceptualization, and treatment. J Psychosom Res 2004;56:387–390.
2 Kroenke K, Sharpe M, Sykes R: Revising the classification of somatoform disorders: key questions and preliminary recommendations. Psychosomatics 2007;48:277–285.
3 Noyes R Jr, Stuart SP, Watson DB: A reconceptualization of the somatoform disorders. Psychosomatics 2008;49:14–22.
4 Hausteiner C, Bornschein S, Bubel E, Groben S, Lahmann C, Grosber M, Löwe B, Eyer F, Eberlein B, Behrendt H, Darsow U, Ring J, Henningsen P, Huber D: Psychobehavioral predictors of somatoform disorders in patients with suspected allergies. Psychosom Med 2009;71:1004–1011.
5 Kirmayer LJ, Robbins JM: Three forms of somatization in primary care: prevalence, co-occurrence, and sociodemographic characteristics. J Nerv Ment Dis 1991;179:647–655.
6 http://www.dsm5.org/ProposedRevisions/Pages/SomatoformDisorders.aspx (accessed Oct 10, 2010).
7 Speckens AEM, Spinhoven P, Van Hemert AM, Bolk JH: The Reassurance Questionnaire (RQ): psychometric properties of a self-report questionnaire to assess reassurability. Psychol Med 2000;30:841–847.
8 Eckblad M, Chapman LJ: Magical thinking as an indicator of schizotypy. J Consult Clin Psychol 1983;51:215–225.
9 Brugger P, Graves R: Testing vs. believing hypotheses: magical ideation in the judgement of contingencies. Cognit Neuropsychiatry 1997;2:251–272.
10 López-Ilundain JM, Pérez-Nievas E, Otero M, Mata I: Peter's delusions inventory in Spanish general population: internal reliability, factor structure and association with demographic variables (dimensionality of delusional ideation). Actas Esp Psiquiatr 2006;34:94–104.
11 Dumas P, Bouafia S, Gutknecht C, Saoud M, Daléry J, d'Amato T: Validation of French versions of magical ideation and perceptual aberration questionnaires (in French). Encephale 2000;26:42–46.
12 Simonds LM, Demetre JD, Read C: Relationships between magical thinking, obsessive-compulsiveness and other forms of anxiety in a sample of non-clinical children. Br J Dev Psychol 2009;27:457–471.
13 Miettunen J, Jääskeläinen E: Sex differences in Wisconsin Schizotypy Scales – a meta-analysis. Schizophr Bull 2010;36:347–358.
14 http://www.ipsos-mori.com/researchpublications/researcharchive/poll.aspx?oItemId=246 (accessed Oct 10, 2010).
15 Irwin HJ: Childhood trauma and the origins of paranormal belief: a constructive replication. Psychol Rep 1994;74:107–111.
16 Perkins SL, Allen R: Childhood physical abuse and differential development of paranormal belief systems. J Nerv Ment Dis 2006;194:349–355.
17 Keinan G: The effects of stress and desire for control on superstitious behavior. Pers Soc Psychol Bull 2002;28:102–108.
18 Nicholls ME, Orr CA, Lindell AK: Magical ideation and its relation to lateral preference. Laterality 2005;10:503–515.

19 Grimshaw GM, Yelle SK, Schoger J, Bright KS: Magical ideation is related to questionnaire but not behavioural measures of handedness. Laterality 2008;13:22–33.
20 Dubal S, Viaud-Delmon I: Magical ideation and hyperacusis. Cortex 2008;44:1379–1386.
21 Lenzenweger MF: Psychometric high-risk paradigm, perceptual aberrations, and schizotypy: an update. Schizophr Bull 1994; 20:121–135.
22 Mason O, Startup M, Halpin S, Schall U, Conrad A, Carr V: Risk factors for transition to first episode psychosis among individuals with 'at-risk mental states'. Schizophr Res 2004;71:227–237.
23 Moulding R, Kyrios M: Anxiety disorders and control related beliefs: the exemplar of Obsessive-Compulsive Disorder (OCD). Clin Psychol Rev 2006;26:573–583.
24 Peters ER, Joseph SA, Garety PA: Measurement of delusional ideation in the normal population: introducing the PDI (Peters et al. Delusions Inventory). Schizophr Bull 1999; 25:553–576.
25 Fröhlich C, Jacobi F, Wittchen HU: DSM-IV pain disorder in the general population: an exploration of the structure and threshold of medically unexplained pain symptoms. Eur Arch Psychiatry Clin Neurosci 2006;256: 187–196.
26 Lieb R, Meinlschmidt G, Araya R: Epidemiology of the association between somatoform disorders and anxiety and depressive disorders: an update. Psychosom Med 2007; 69:860–863.
27 Hausteiner C, Mergeay A, Bornschein S, Zilker T, Förstl H: New aspects of psychiatric morbidity in idiopathic environmental intolerances. J Occup Environ Med 2006;48: 76–82.
28 Bergdahl M, Bergdahl J: Temperament and character personality dimensions in patients with dental anxiety. Eur J Oral Sci 2003;111: 93–98.
29 Irwin HJ: Paranormal belief and proneness to dissociation. Psychol Rep 1994;75:1344–1346.
30 Murray C, Fox J: The out-of-body experience and body image: differences between experiments and nonexperiments. J Nerv Ment Dis 2005;193:70–72.
31 te Wildt BT, Schultz-Venrath U: Magical ideation – defense mechanism or neuropathology? A study with multiple sclerosis patients. Psychopathology 2004;37:141–144.
32 Breuer GS, Orbach H, Elkayam O, Berkun Y, Paran D, Mates M, Nesher G: Perceived efficacy among patients of various methods of complementary alternative medicine for rheumatologic diseases. Clin Exp Rheumatol 2005;23:693–696.
33 Gibson PR, Elms AN, Ruding LA: Perceived treatment efficacy for conventional and alternative therapies reported by persons with multiple chemical sensitivity. Environ Health Perspect 2003;111:1498–1504.
34 Astin JA: Why patients use alternative medicine: results of a national study. JAMA 1998; 279:1548–1553.
35 Aarnio K, Lindeman M: Magical food and health beliefs: a portrait of believers and functions of the beliefs. Appetite 2004;43: 65–74.
36 Kirmayer LJ, Robbins JM: Three forms of somatization in primary care: prevalence, cooccurrence, and sociodemographic characteristics. J Nerv Ment Dis 1991;179:647–655.
37 Wittchen HU, Wunderlich U, Gruschwitz S, Zaudig M: SCID I: Structured Clinical Interview for DSM-IV: Axis I: Mental Disorders. Göttingen, Hogrefe, 1997.
38 Kroenke K, Spitzer RL, deGruy FV 3rd, Hahn SR, Linzer M, Williams JB, Brody D, Davies M: Multisomatoform disorder: an alternative to undifferentiated somatoform disorder for the somatizing patient in primary care. Arch Gen Psychiatry 1997;54:352–358.
39 Löwe B, Zipfel S, Herzog W: Patient Health Questionnaire. German version. Karlsruhe, Pfizer, 2002.
40 Kroenke K, Spitzer RL, Williams JB: The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms. Psychosom Med 2002;64:258–266.
41 Kroenke K, Spitzer RL, Williams JB: The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16:606–613.
42 Spitzer RL, Kroenke K, Williams JB, Löwe B: A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med 2006;166:1092–1097.
43 Raine A: The SPQ: a scale for the assessment of schizotypal personality based on DSM-III-R criteria. Schizophr Bull 1991;17:555–564.
44 Klein C, Andresen B, Jahn T: Construct validation of the German adaptation of the schizotypal personality questionnaire (SPQ); in Andresen B, Mass R: Schizotypy: Psychometric Developments and Biopsychological Approaches. Göttingen, Hogrefe, 2001, pp 349–378.
45 Witthöft M, Rist F, Bailer J: Evidence for a specific link between the personality trait of absorption and idiopathic environmental intolerance. J Toxicol Environ Health A 2008;71:795–802.
46 Kuyk J, Spinhoven P, van Dyck R: Hypnotic recall: a positive criterion in the differential diagnosis between epileptic and pseudoepileptic seizures. Epilepsia 1999;40:485–491.
47 DiClementi JD, Schmaling KB, Jones JF: Information processing in chronic fatigue syndrome: a preliminary investigation of suggestibility. J Psychosom Res 2001;51:679–686.
48 Roelofs K, Hoogduin CAL, Keusers GPJ, Näring GWB, Moene FC, Sandijck P: Hypnotic susceptibility in patients with conversion disorder. J Abnorm Psychol 2002;111: 390–395.
49 Brown RJ, Schrag A, Krishnamoorthy E, Trimble MR: Are patients with somatization disorder highly suggestible? Acta Psychiatr Scand 2008;117:232–235.
50 Sack M, Lahmann C, Jaeger B, Henningsen P: Trauma prevalence and somatoform symptoms: are there specific somatoform symptoms related to traumatic experiences? J Nerv Ment Dis 2007;195:928–933.
51 Musella DP: Gallup poll shows that Americans' belief in the paranormal persists. Skeptical Inquirer 2005;29:5.
52 http://www.ipsos-mori.com/researchpublications/researcharchive/poll.aspx?oItemId=2082 (accessed Oct 10, 2010).
53 Milling LS, Kirsch I, Allen GJ, Reutenauer EL: The effects of hypnotic and nonhypnotic imaginative suggestion on pain. Ann Behav Med 2005;29:116–127.
54 Miller V, Whorwell PJ: Hypnotherapy for functional gastrointestinal disorders: a review. Int J Clin Exp Hypn 2009;57:279–292.
55 Walach H, Bosch H, Lewith G, Naumann J, Schwarzer B, Falk S, Kohls N, Haraldsson E, Wiesendanger H, Nordmann A, Tomasson H, Prescott P, Bucher HC: Effectiveness of distant healing for patients with chronic fatigue syndrome: a randomised controlled partially blinded trial (EUHEALS). Psychother Psychosom 2008;77:158–166.
56 Brown CK: Spiritual healing in general practice: using a quality of life questionnaire to measure outcome. Complement Ther Med 1995;3:230–233.
57 Dixon M: Does 'healing' benefit patients with chronic symptoms? A quasi-randomized trial in general practice. J R Soc Med 1998;91:183–188.
58 Arnold LM, Clauw DJ, Wohlreich MM, Wang F, Ahl J, Gaynor PJ, Chappell AS: Efficacy of duloxetine in patients with fibromyalgia: pooled analysis of 4 placebo-controlled clinical trials. Prim Care Companion J Clin Psychiatry 2009;11:237–244.
59 Zacharias S: Mexican Curanderismo as ethnopsychotherapy: a qualitative study on treatment practices, effectiveness, and mechanisms of change. Int J Disability Dev Educ 2006;53:381–400.
60 Cho HJ, Hotopf M, Wessely S: The placebo response in the treatment of chronic fatigue syndrome: a systematic review and meta-analysis. Psychosom Med 2005;67:301–313.
61 Glucklich A: The End of Magic. New York, Oxford University Press, 1997, pp 50–68.