

Somatoform dissociation and traumatic experiences in patients with rheumatoid arthritis and fibromyalgia

G.W.B. Näring¹, W. van Lankveld², R. Geenen³

¹Radboud University Nijmegen, Department of Clinical Psychology, Behavioral Science Institute, The Netherlands; ²Sint Maartenskliniek Research, Nijmegen, The Netherlands; ³Utrecht University, Department of Clinical and Health Psychology, Utrecht, The Netherlands.

Abstract

Objective

Trauma and dissociation tend to be interrelated. The objective of this study was to examine the frequency of traumatic experiences and somatoform dissociation in patients with fibromyalgia syndrome (FMS) or rheumatoid arthritis (RA), two conditions that are both characterized by pain and disability.

Methods

Patients with a diagnosis of FMS (2 male, 26 female; mean age 42 ± 11 years) or RA (5 male, 46 female; mean age 46 ± 10 years) completed the Fibromyalgia Impact Questionnaire (FIQ), the Somatoform Dissociation Questionnaire (SDQ), and the Traumatic Experience Checklist (TEC).

Results

Patients with FMS reported significantly higher levels of various forms of traumatization and dissociation than patients with RA. In patients with FMS, but not in patients with RA, there was a significant correlation between traumatization and dissociative symptoms. A possible dissociative disorder was indicated in 10% of the patients with FMS and 2% of the patients with RA

Conclusions

Traumatization experiences are frequent in FMS, but as compared to conversion disorder or dissociative identity disorder only a small subgroup of patients with FMS or RA shows the combination of traumatization and somatoform dissociation. The observation of somatoform dissociation calls for a broad treatment approach with a special role of the psychologist or psychiatrist.

Key words

Arthritis, rheumatoid psychology, fibromyalgia psychology, child abuse psychology, violence psychology, accidents, occupational, crime victims psychology.

G rard W.B. N ring, PhD, Associate Professor; Wim van Lankveld, PhD, Senior Researcher; Rinie Geenen, PhD, Professor.

Please address correspondence and reprint requests to: Dr. G. N ring, Dept. of Clinical Psychology, Radboud University Nijmegen, P.O. Box 9104, 6500 HE Nijmegen, The Netherlands. E-mail: g.naring@psych.ru.nl

Received on January 25, 2007; accepted in revised form on July 3, 2007.

  Copyright CLINICAL AND EXPERIMENTAL RHEUMATOLOGY 2007.

Introduction

Fibromyalgia syndrome (FMS) comprises chronic non-articular musculoskeletal pain in the absence of inflammatory or structural musculoskeletal abnormalities and hypersensitivity of tender points, often accompanied by several non-specific symptoms. Although there are no studies that permit the conclusion that trauma causes FMS, trauma may be an initiating or perpetuating factor in a subgroup of patients. The onset of fibromyalgia has been associated with a history of physical (1, 2) or psychological (3, 4) trauma, and a high frequency of post traumatic stress disorder (PTSD) (5) and PTSD-like symptoms (6) has been observed in FMS.

The high level of stress during and after a trauma may lead to incomplete or maladaptive processing of the event that in turn may result in the information processing deficit 'dissociation' (7), that is, "disruption of the usually integrated functions of consciousness, memory, identity, or perceptions of the environment" (8). Dissociative symptoms are commonly described as psychoform and in the domain of memory, identity, consciousness, or perception (9). The last decade stressed the somatic consequences of traumatization, *i.e.*, the sensorimotor organization of traumatic memories (10, 11) and somatoform symptoms (12-14) that pertain to sensory and motor components of experience, *e.g.*, hearing, seeing, feeling, speaking, and moving (15). Somatoform symptoms may also include pain symptoms that may require specific psychotherapeutic treatment. The frequency of these somatoform dissociative symptoms in patients with FMS is unknown.

The DSM-IV (8) states that a trauma involves a threat to one's life or physical integrity and gives rise to a subjective response of fear and helplessness, but dissociative symptoms have been studied in the context of a wide range of potentially traumatizing events such as emotional neglect, emotional abuse, physical abuse, sexual harassment, and sexual abuse (16). Many clinicians endorse the idea that fibromyalgia can be triggered by several types of physical or emotional trauma (17).

The validity of self-reported trauma is an issue that received attention. While retrospective reports in normal subjects may underestimate the occurrence of abuse and neglect (18), in patients with a diagnosis of dissociative disorders, some forms of psychotherapy seem to be able to foster false memories (19). Pain has been observed to lead to recall of both negative and pain-related life-events (20). This factor can be adjusted for by comparing the frequency of traumatic experiences in patients with FMS and patients with another pain disorder like rheumatoid arthritis (RA).

A trauma can result in an anxiety disorder as PTSD in some patients, but it can also lead to a range of psychoform or somatoform symptoms. In patients with FMS, high levels of psychoform dissociative symptoms were reported (21), but the frequency of somatoform symptoms has not been investigated yet. The observation of somatoform symptoms in patients with FMS can lead to more appropriate clinical care. The aim of this study was to examine the frequency of traumatic experiences and somatoform dissociation in patients with FMS or RA.

Patients and methods

Recruitment and data collection

With the approval of the local ethics commission, 50 patients who fulfilled the classification criteria of FMS (22) and 80 patients with a RA (23) diagnosis were invited by letter to participate in a research project about the consequences of various diseases. All were younger than 65 and attended the St. Maartenskliniek Department of Rheumatology as outpatients. Twenty-eight patients with FMS, 2 men and 26 women, and 51 patients with RA, 5 men and 46 women, returned the questionnaires. The response rate of the patients with FMS and RA did not differ significantly, 56% vs. 64% respectively.

Questionnaires

Patients completed the Fibromyalgia Impact Questionnaire (FIQ), the Somatoform Dissociation Questionnaire (SDQ), and the Traumatic Experience Checklist (TEC).

Competing interests: none declared.

Impact of the disease (FIQ). The impact of the disease was measured with the Fibromyalgia Impact Questionnaire (FIQ; (24-26)). In the questionnaire, the word fibromyalgia was replaced by the word 'your illness'. The FIQ measures limitations, and physical and psychological well-being. The FIQ consists of 10 items. The first item contains 10 questions on activities of daily living, each of which are scored in a Likert format from 0 (*always able to do*) to 3 (*never able to do*). The scores are added and divided by the number of valid scores to yield one score for physical functioning. Item 2 is the number of days (0-7) felt good during the past week. Item 3 asks for the number of days off work during the past week (0-5). Items 4-10 (ability to do job, pain, fatigue, morning tiredness, stiffness, anxiety and depression) are measured by 100 mm visual analogue scales. The scores of each item are standardized on a scale ranging from 0-10 with higher scores indicating greater impairment.

Somatoform dissociation was measured with the Somatoform Dissociation Questionnaire (SDQ-20; (27)). The SDQ-20 is a 20-item questionnaire that includes the negative symptoms anesthesia, analgesia, and motor inhibitions, and the positive symptoms localized pain, alternation of taste and smell preferences/aversions. Examples of sensory losses are analgesia ('Sometimes my body, or a part of it, is insensitive to pain'), kinesthetic anesthesia ('Sometimes it is as if my body, or a part of it, has disappeared'), and motor inhibitions ('Sometimes I am paralyzed for a while'; 'Sometimes I cannot speak, or only whisper'). Anesthesia also pertains to visual ('Sometimes I cannot see for a while'), and auditory perception ('Sometimes I hear sounds from nearby as if they were coming from far away'). Positive symptoms include 'Sometimes I have pain while urinating,' and 'Sometimes I feel pain in my genitals (at times other than sexual intercourse)' (14). Five-point scales are used to indicate to what degree the statements apply. The total score ranges from 20 to 100. The reliability of the scale is high and the construct validity is good (28).

Traumatization was assessed using the initial version of the Traumatic Experiences Checklist (TEC; (12)). A slightly extended version of the TEC was shown to have good psychometric properties (16). The TEC is a self-report questionnaire inquiring about 25 types of potential trauma, including criterion A events of PTSD ('the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others', APA, 1994, p. 427), as well as other potentially overwhelming events: loss of significant others; life threat by disease or assault; war experience; emotional neglect, emotional abuse, physical abuse, sexual harassment, and sexual trauma. With respect to emotional neglect, emotional abuse, physical abuse, sexual harassment, and sexual abuse, patients can indicate at which age (in years) it happened and, as appropriate, the period for which it continued. Patients indicated how much impact the event still had on their present life on a 5-point scale ranging from 'not at all' to 'very seriously'. Sexually abused respondents indicated their relationship to the person mentioned in the answer (e.g., father, brother, friend, teacher, stranger), and they added if the person(s) was (were) at least 4 years older than they were at the time of the experience. The TEC total score involves the endorsed number of potentially traumatizing events (0-25). For each of the trauma areas emotional neglect, emotional abuse, physical abuse, sexual harassment, and sexual abuse composite scores (range 0-12) can be calculated. This is done by raising the incidence score based upon information about each of the following aspects: the duration of the traumatic experience, the relationship to the person causing it, the indicated severity of the experience, and the person's age at the start and end of the experience. This procedure makes composite scores especially sensitive for traumatic experiences until the age of 18. A trauma area composite total score results from summing up these five scores (0-60). The two types of scoring enable an assessment of frequency and impact of a wide range of potentially traumatizing events.

Statistical analysis

With Fisher's exact test we tested the relationship between categorical variables. For every subscale of the FIQ, the scores of the two patient groups were compared using Student's *t*-test. Because the composite scores for traumatization TEC and scores on the SDQ were not normally distributed, these scores were compared using the non-parametric Mann-Whitney U test. For the purpose of calculating Pearson correlations these scores were subsequently transformed to achieve normality. We raised TEC scores by 1 and then took the natural logarithm. SDQ scores were transformed by subtracting 20 from the raw score and then taking the square root (29). After transformations both TEC and SDQ were normally distributed. The relation between the SDQ scores (dependent variable) and diagnosis and traumatization was examined by analysis of variance. Cohen's effect size score (*d*) was computed to quantify group differences on the SDQ in standard deviation units (30).

Results

Table I compares demographic features of the FMS and RA groups. No significant differences between the groups were found.

Impact of the disease. The impact of the disease as measured with the Fibromyalgia Impact Questionnaire is given in Table II. The patients with FMS reported significantly more impact of the disease than patients with RA regarding limitations and physical and psychological well-being. Self-reports of 'number of days felt alright' and 'number of days not worked' did not differ between the groups of patients.

Traumatizing events. The number of patients reporting at least one traumatizing event, was higher in FMS, 23 (82%), than in RA, 31 (61%), $\chi^2(1) = 3.81, p = .051$. Frequencies of separate categories of reported events are given in Table III. Patients with FMS significantly more often reported emotional neglect, emotional abuse, and sexual harassment than patients with RA. The reported frequency of physical abuse and sexual abuse did not differ significantly between FMS and RA. Patients with FMS also reported

Table I. Demographic features of patients with fibromyalgia and rheumatoid arthritis.

	Fibromyalgia (n = 28)	Rheumatoid arthritis (n = 51)	p value
Female	92.9 %	90.2 %	.52
Age	42.0 (10.8)	45.6 (9.6)	.13
Disease duration	4.8 (4.6)	5.4 (3.2)	.51
Living with partner	89.3 %	86.2 %	

Table II. Mean scores on the Fibromyalgia Impact Questionnaire for the two patient groups.

	Fibromyalgia (n = 28)	Rheumatoid arthritis (n = 51)	p value
Part 1 (10 subitems)			
Physical functioning	12.20 (5.21)	7.01 (5.84)	< .001
Part 2 (2 items)			
no. of days OK	3.07 (2.14)	2.96 (2.59)	.839
no. of days not worked	.43 (1.17)	.18 (.82)	.317
Part 3 VAS scales			
Job ability	7.36 (2.56)	4.34 (3.15)	< .001
Pain	7.12 (1.96)	5.87 (2.99)	.028
Fatigue	8.40 (1.18)	6.11 (2.57)	< .001
Morning Fatigue	7.85 (1.99)	4.98 (2.38)	< .001
Stiffness	7.64 (1.70)	4.48 (2.47)	< .001
Anxiety	4.07 (2.44)	2.43 (2.28)	.004
Depression	3.47 (2.61)	1.98 (2.10)	.007
FIQ Part 2	5.50 (3.81)	4.86 (4.37)	.523
FIQ Part 3	46.17 (9.17)	31.05 (12.80)	< .001

Note: A higher score reflects a higher impact of the disease.

Table III. Frequency of reported trauma and traumatization composite indices from the TEC in the two patient groups.

	Fibromyalgia	Rheumatoid arthritis	p value
Trauma; frequencies and percentages			
At least one event	82.0 %	61.0 %	.051
Emotional neglect	35.7 %	17.7 %	.047
Emotional abuse	32.1 %	11.8 %	.037
Physical abuse	21.4 %	9.8 %	NS
Sexual harassment	35.7 %	13.7 %	.047
Sexual abuse	21.4 %	7.8 %	NS
Traumatization composite indices; means ($\pm$ SD)			
Total no. of events	4.25 (3.75)	1.88 (2.98)	.002
Composite score	7.57 (10.93)	3.27 (8.55)	.008
Emotional neglect	2.61 (4.19)	1.12 (3.04)	.029
Emotional abuse	1.96 (3.39)	.92 (2.82)	.037
Physical abuse	1.43 (3.06)	.78 (2.80)	.163
Sexual harassment	.89 (1.37)	.31 (.95)	.020
Sexual abuse	.68 (1.42)	.14 (.53)	.062

For frequencies χ^2 is reported, for composite scores Mann-Whitney U test.
A higher score reflects increased traumatization.

significantly more (total) traumatizing events than patients with RA, 4.25 ± 3.75 and 1.88 ± 2.98 , $U = 487.0$, $p < .001$.

The TEC score also incorporates the scores on the two questions about experiences of a life-threatening experience

through illness, surgery, motor vehicle accidents or other accidents. In an additional analysis the answers on these two questions were separately scored as absent or present. Patients with FMS did not report more of these experiences than patients with RA, 40.7% and 31.4% respectively, $\chi^2(1) = .69$, $p = .41$. An index of the severity of the possible traumatization is given by the composite scores on the TEC (Table III). Patients with FMS had significantly higher scores than patients with RA on composite scores of emotional neglect, emotional abuse, and sexual harassment. Composite scores on physical abuse and sexual abuse did not significantly differ between the two groups.

Somatoform dissociation. The patients with fibromyalgia had significantly higher scores than the patients with rheumatoid arthritis on the SDQ, 25.27 ± 7.11 vs. 21.41 ± 2.47 , respectively, $p = .001$, $d = 0.79$. Three patients with FMS, 10%, and one with RA, 2%, had a score of 30 or higher on the SDQ, which indicates a possible dissociative disorder, $\chi^2(1) = 2.88$, $p = .125$.

Relation between trauma, somatoform dissociation and impact of the disease

The correlation between the transformed TEC (trauma) and SDQ (somatoform dissociation) scores for all patients was $r = .45$, $p < .001$. This correlation calculated for the patients with FMS was $r = .48$, $p = .01$ and $r = .24$, n.s., for patients with RA.

We performed additional analyses to assess the relation between diagnosis, trauma and somatoform dissociation. A 2 Traumatization (yes/no) $\times$ 2 Diagnosis (FMS/RA) analysis of variance on SDQ scores indicated that Traumatization was a marginally significant predictor of somatoform dissociation, $F(1, 75) = 3.30$, $p = .073$. Diagnosis was a significant predictor, $F(1, 75) = 5.65$, $p = .02$. In fibromyalgia more somatoform dissociation was observed.

Neither the correlations between the total FIQ score and the transformed TEC (trauma) score (FMS: $r = .12$, RA: $r = .04$) nor the correlations between the total FIQ score and the transformed somatoform dissociation score (FMS: $r = .13$, RA: $r = .03$) were significant.

Discussion

Patients with FMS report significantly higher levels of traumatization and somatoform dissociation than patients with RA. The percentages of sexual abuse in FMS and RA, 21.4% vs. 7.8%, are comparable to previously observed percentages (31). The incidence of adult life-threatening experiences such as motor vehicle accidents is equally high in both groups. Our findings replicate and extend previous findings (3) of more self-reported victimization and dissociation in patients with FMS than in patients with RA.

It has been suggested that adult stress may be a contributing factor to the development of FMS (1, 3, 4), while the role of stress in the etiology of RA is unclear and unproven (32). In a prospective study, workplace bullying, high workload and decision latitude were associated with the development of FMS (33). For both FMS and PTSD, abnormal stress system function has been observed (34, 35), but a major dilemma exists in interpreting the source of this altered functioning. It may reflect an impairment that is constitutional or acquired by being exposed to severe trauma in the past, but it is also possible that reduced stress responsiveness reflects the current consequences of stress, low physical fitness, sleep disturbance, or pain (35). Our current study observed that *adult* traumatic experiences are equally often reported in FMS and RA, while *childhood* trauma was more often reported in FMS than RA. This suggests that childhood trauma may predispose to the development of fibromyalgia, a suggestion that needs confirmation in prospective studies.

Possible results of childhood traumatization were outlined in recent theories on the reactions to traumatic stress. In these theories two major patterns in response to trauma were identified: dissociation and hyperarousal (36). A study on the influence of age of traumatization revealed that children respond to trauma more often with dissociative reactions than with hyperarousal. Our group of patients with FMS reported especially more childhood traumatization and consequently dissociative reactions may have occurred. This does

not, however, explain why especially women develop FMS. It is known that women have a higher risk to experience sexual harassment and sexual abuse (37). Women also have higher perceptions of threat or control loss and it was suggested that this may enhance their risk of developing PTSD (37). The number of men in our study is unfortunately, too low to address the influence of gender properly. Future studies should try to include more men to take the gender issue into account.

Our study did not include a control group of the general population or other disease groups, but some indication about the frequency of somatoform dissociation can be derived from other studies. Patients with FMS have a moderately higher mean score on somatoform dissociation (25.3) than the patients with RA (21.4), patients with bipolar mood disorder (22.9) (14), or Dutch non-patients comparable in age to the patient groups in the present study (23.20) (29). As the scores of the patients with FMS are much lower than the mean levels in conversion disorder (31.9) or dissociative identity disorder (51.8) (14), somatoform dissociation is not characteristic of fibromyalgia.

The correlation between traumatic experiences and somatoform dissociation was significant in FMS and non-significant in RA, which showed a correlation comparable to an aselect sample of adults (29). Only some FMS patients show high levels of both traumatic experiences and somatoform dissociation. One study observed psychoform dissociation in 30% of FMS patients and 7% of RA patients and proposed that dissociation might be a fruitful perspective for understanding FMS (38). Our study observed somatoform dissociation in 10% of the FMS patients and 2% of the RA patients. Results of both studies suggest that some patients with fibromyalgia have distinct dissociative psychopathology that requires further diagnostic attention (38). For this specific subgroup a PTSD-like treatment may offer help.

In accordance with a previous study (39), the impact of the disease as measured with the Fibromyalgia Impact Questionnaire reveals highly significant

differences between the two patient groups. Several mechanisms may explain this difference among which an abnormality in self-monitoring mechanisms (40). Our analyses showed that the impact of the disease was not correlated to trauma or somatoform dissociation scores. The answer to the question whether trauma or dissociation may play an initiating or a perpetuating role is beyond the scope of the current study, but our analyses do suggest that the quality or quantity of perceived disease impact is independent of past trauma or somatoform dissociation.

The hypothesis that childhood victimization may play an etiological role in chronic pain has been challenged (41). An explanation for the higher memory of past traumas might be that especially patients that have a biomedically invisible disease may start to look for events in their past that help them understand why they have complaints (42). A recent review on the validity of adult retrospective reports of adverse childhood experiences proposed that false negatives are more common than false positives (18). The issue of the accuracy of memories of past trauma is controversial and only truly prospective studies in population samples can confirm or reject the hypothesis about the etiological role of childhood trauma. However, whatever the answer to this question, the observed high frequency of the perception of past trauma in fibromyalgia is important, because it is the current reality of individuals.

Some use labels such as somatization, somatoform disorders, and functional somatic symptoms to refer to somatic symptoms that cannot be explained in terms of a conventionally defined medical disease (43). Somatoform dissociation is, however, certainly not just another label for medically unexplained symptoms, which can be demonstrated by comparing the items that are used to assess these constructs (38). The concept of somatoform dissociation provides a framework to understand somatization disorder, hypochondriasis, and conversion disorder (44)

Fibromyalgia is one of a number of syndromes where patients frequently report a history of childhood maltreatment and

abuse. Also in this study, patients with FMS reported significantly higher levels of traumatization. Only a small part of patients with FMS or RA in our study reported not only trauma experiences but also somatoform dissociation. This combination seems to point to somatoform consequences of traumatization that call for a broad treatment approach or a special role of psychologist or psychiatrist (43).

References

- AL-ALLAF AW, DUNBAR KL, HALLUM NS, NOSRATZADEH B, TEMPLETON KD, PULLAR T: A case-control study examining the role of physical trauma in the onset of fibromyalgia syndrome. *Rheumatology* (Oxford) 2002; 41: 450-3.
- GREENFIELD S, FITZCHARLES MA, ESDAILE JM: Reactive Fibromyalgia Syndrome. *Arthritis Rheum* 1992; 35: 678-81.
- WALKER EA, KEEGAN D, GARDNER G, SULLIVAN M, BERNSTEIN D, KATON WJ: Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: II. Sexual, physical and emotional abuse and neglect. *Psychosom Med* 1997; 59: 572-7.
- VAN HOUDENHOVE B, NEERINCKX E, LYSSENS R *et al.*: Victimization in chronic fatigue syndrome and fibromyalgia in tertiary care - A controlled study on prevalence and characteristics. *Psychosomatics* 2001; 42: 21-8.
- COHEN H, NEUMANN L, HAIRMAN Y, MATAR MA, PRESS J, BUSKILAD: Prevalence of post-traumatic stress disorder in fibromyalgia patients: Overlapping syndromes or post-traumatic fibromyalgia syndrome? *Semin Arthritis Rheum* 2002; 32: 38-50.
- SHERMAN JJ, TURK DC, OKIFUJI A: Prevalence and impact of posttraumatic stress disorder-like symptoms on patients with fibromyalgia syndrome. *Clin J Pain* 2000; 16: 127-34.
- BREWEN CR, DALGLEISH T, JOSEPH S: A dual representation theory of posttraumatic stress disorder. *Psychol Rev* 1996; 103: 670-86.
- AMERICAN PSYCHIATRIC ASSOCIATION: *Diagnostic and Statistical Manual for Mental Disorders*. 4th. ed., Washington, D.C.: American Psychiatric Association, 1994.
- KIHLSTROM JF, GLISKY ML, ANGIULO MJ: Dissociative tendencies and dissociative disorders. *J Abnorm Psychol* 1994; 103: 117-24.
- VAN DER KOLK BA, MCFARLANE AC, WEISAEHL L: Traumatic stress: the effects of overwhelming experience on mind, body, and society. New York, The Guilford Press, 1996.
- VAN DER KOLK BA: The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harv Rev Psychiatry* 1994; 1: 253-65.
- NIJENHUIS ERS, SPINHOVEN P, VAN DYCK R, VAN DER HART O, VANDERLINDEN J: Degree of somatoform and psychological dissociation in dissociative disorder is correlated with reported trauma. *J Trauma Stress* 1998; 11: 711-30.
- ROELOFS K, KEIJERS GPJ, HOOGLUIN KAL, NÄRING GWB, MOENE FC: Childhood abuse in patients with conversion disorder. *Am J Psychiatry* 2002; 159: 1908-13.
- NIJENHUIS ERS: Somatoform Dissociation: Major symptoms of dissociative disorders. *J Trauma Dissociation* 2000; 1: 7-32.
- VAN DER HART O, VAN DIJKE A, VAN SON M, STEELE K: Somatoform dissociation in traumatized World War I combat soldiers: A neglected clinical heritage. *J Trauma Dissociation* 2000; 1: 33-66.
- NIJENHUIS ERS, VAN DER HART O, KRUGER K: The psychometric characteristics of the Traumatic Experiences Questionnaire (TEC): First findings among psychiatric outpatients. *Clin Psychol Psychother* 2002; 9: 200-10.
- GOLDENBERG DL, SANDHU HS: Fibromyalgia and post-traumatic stress disorder: Another piece in the biopsychosocial puzzle. *Semin Arthritis Rheum* 2002; 32: 1-2.
- HARDT J, RUTTER M: Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. *J Child Psychol Psychiatry* 2004; 45: 260-73.
- LOFTUS E: Memory distortion and false memory creation. *Bull Am Acad Psychiatry Law* 1996; 24: 281-95.
- HUSE E, KNOTT B, FLOR H: Autobiographisches Gedächtnis bei Patienten mit chronischen Schmerzen. *Z Klin Psychol Psychother* 1999; 28: 199-204.
- WALKER EA, KEEGAN D, GARDNER G, SULLIVAN M, BERNSTEIN D, KATON WJ: Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: I. Psychiatric diagnoses and functional disability. *Psychosom Med* 1997; 59: 565-71.
- WOLFE F, SMYTHE HA, YUNUS MB *et al.*: The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. *Arthritis Rheum* 1990; 33: 160-72.
- ARNETT FC, EDWORTHY SM, BLOCH DA *et al.*: The American Rheumatism Association 1987 Revised Criteria For The Classification Of Rheumatoid Arthritis. *Arthritis Rheum* 1988; 31: 315-24.
- BURCKHARDT CS, CLARK SR, BENNETT RM: The fibromyalgia impact questionnaire: development and validation. *J Rheumatol* 1991; 18: 728-33.
- ZIJLSTRA TR, TAAL E, VAN DE LAAR MAFJ, RASKER JJ: Validation of a Dutch translation of the fibromyalgia impact questionnaire. *Rheumatology* (Oxford) 2007; 46: 131-4.
- BENNETT R: The Fibromyalgia Impact Questionnaire (FIQ): a review of its development, current version, operating characteristics and uses. *Clin Exp Rheumatol* 2005; 23 (Suppl.39): S154-S62.
- NIJENHUIS ERS, SPINHOVEN P, VAN DYCK R, VAN DER HART O, VANDERLINDEN J: The development and psychometric characteristics of the Somatoform Dissociation Questionnaire (SDQ-20). *J Nerv Ment Dis* 1996; 184: 688-94.
- NIJENHUIS ERS, SPINHOVEN P, VAN DYCK R, VAN DER HART O, VANDERLINDEN J: Psychometric characteristics of the somatoform dissociation questionnaire: A replication. *Psychother Psychosom* 1998; 67: 17-23.
- NÄRING GWB, NIJENHUIS ERS: Relationships between self-reported potentially traumatizing events, psychoform and somatoform dissociation, and absorption, in two non-clinical populations. *Aust N Z J Psychiatry* 2005; 39: 982-7.
- COHEN J: *Statistical power analysis for the behavioral sciences*. New York: Academic Press, 1977.
- BOISSET-PIORO MH, ESDAILE JM, FITZCHARLES MA: Sexual and physical abuse in women with fibromyalgia syndrome. *Arthritis Rheum* 1995; 38: 235-41.
- GEENEN R, VAN MIDDENDORP H, BIJLSMA JWJ: The impact of stressors on health status and hypothalamic-pituitary-adrenal axis and autonomic nervous system responsiveness in rheumatoid arthritis. *Ann N Y Acad Sci* 2006; 1069: 77-97.
- KIVIMAKI M, LEINO-ARJAS P, VIRTANEN M *et al.*: Work stress and incidence of newly diagnosed fibromyalgia: Prospective cohort study. *J Psychosom Res* 2004; 57: 417.
- MCLEAN SA, CLAUW DJ, ABELSON JL, LIBERSON I: The development of persistent pain and psychological morbidity after motor vehicle collision: Integrating the potential role of stress response systems into a biopsychosocial model. *Psychosom Med* 2005; 67: 783-90.
- ADLER GK, GEENEN R: Hypothalamic-pituitary-adrenal and autonomic nervous system functioning in fibromyalgia. *Rheum Dis Clin North Am* 2005; 31: 187-202.
- PERRY BD, POLLARD R: Homeostasis, stress, trauma, and adaptation: A neurodevelopmental view of childhood trauma. *Child Adolesc Psychiatr Clin N Am* 1998; 7: 33-51.
- OLFF M, LANGELAND W, DRAIJER N, GERSON BPR: Gender Differences in Posttraumatic Stress Disorder. *Psychol Bull* 2007; 133: 183-204.
- LEAVITT F, KATZ RS: The dissociative factor in symptom reports of rheumatic patients with and without fibromyalgia. *J Clin Psychol* 2003; 10: 259-66.
- VAN HOUDENHOVE B, NEERINCKX E, ONGHENA P, VINGERHOETS A, LYSSENS R, VERTOMMEN H: Daily hassles reported by chronic fatigue syndrome and fibromyalgia patients in tertiary care: A controlled quantitative and qualitative study. *Psychother Psychosom* 2002; 71: 207-13.
- KARST M, RAHE-MEYER N, GUEDEK A, HOY L, BORSUTZKY M, PASSIE T: Abnormality in the Self-monitoring Mechanism in Patients With Fibromyalgia and Somatoform Pain Disorder. *Psychosom Med* 2005; 67: 111-5.
- RAPHAEL KG, WIDOM CS, LANGE G: Childhood victimization and pain in adulthood: a prospective investigation. *Pain* 2001; 92: 283-93.
- JAPP PM, JAPP DK: Desperately seeking legitimacy: Narratives of a biomedically invisible disease. In: HARTER LM, JAPP PM, BECK CS (Eds.): *Narratives, health, and healing: Communication theory, research, and practice*. Mahwah, NJ, US: Lawrence Erlbaum Associates, 2005, p. 107-30.
- WESSELY S, NIMNUAN C, SHARPE M: Functional somatic syndromes: one or many? *Lancet* 1999; 354: 936-9.
- SAR V, KUNDAKCI T, KIZILTAN E, BAKIM B, BOZKURT O: Differentiating dissociative disorders from other diagnostic groups through somatoform dissociation in Turkey. *J Trauma Dissociation* 2000; 1: 67-80.