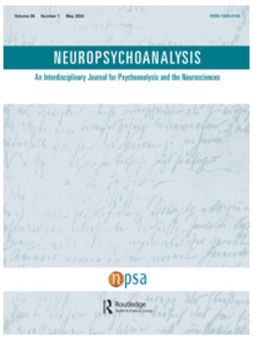

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The QSP-31: a multidimensional questionnaire for assessing psychosocial / psychodynamic aspects in patients with somatoform pain

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ABSTRACT

Somatoform pain poses major challenges in medicine. There is a lack of quantitative instruments that systematically assess psychosocial aspects of somatoform pain. A better knowledge of such aspects could contribute (1) to gaining further insight into the relationship between psychodynamic and psychosocial components of pain, and (2) to facilitating the development and monitoring of improved interventions targeting psychodynamic and psychosocial mechanisms of pain. An item pool on biopsychosocial aspects of pain was developed and completed by 200 patients with somatoform pain disorder. In addition, anxiety (STAI), depression (BDI II), somatization (SOMS-2), and quality of life (SF-36) were assessed. As compared to norm data, patients reported higher scores for anxiety (STAI), depression (BDI-II) somatization (SMOS-2), and lower quality of life (SF-36). Applying item and factor analyses, a new questionnaire (QSP-31) was developed to identify psychodynamic and psychosocial aspects of pain. There was evidence for the construct validity of the six scales through confirmatory factor analysis: Relationships between pain and negative emotions, Negative attitudes towards help-seeking, Negative pain-related childhood experiences, Negative attitudes towards own body, Negative aspects of the doctor-patient relationship, and Perceived pain control. Cronbach's alpha coefficients for these scales lay within the range of .81-.92. Regarding criterion validity, moderate correlations in expected directions were found between all scales and anxiety, depression, somatic symptom severity, and quality of life, except for the scale Perceived pain control. The QSP-31 appears promising for the identification of relevant psychosocial aspects associated with the experience of pain and might be a useful instrument.

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Pain; somatoform pain; questionnaire; development; validation

Introduction

According to the definition of the International Association for the Study of Pain (IASP), pain is: "[…] an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey & Bogduk, 1994). In the international classifications ICD and DSM there are different concepts regarding so-called "somatoform pain." In ICD-10, somatoform pain disorder (ICD-10: F45.40) is described as a syndrome whose symptoms consist of the subjective experience of pain which cannot be adequately explained by physical impairment. In the DSM-5-TR's conception of "somatic symptom disorder," no significant importance is given to the influence of the mental state on the physical symptom of pain; rather, it is primarily a question of the physical effect of the pain on the mental state. In this respect, the DSM-5-TR concept is more or less unidirectional, i.e. physical pain has psychosocial consequences (American Psychiatric Association, 2022). On the contrary, the upcoming ICD-11 version of "bodily distress disorder (BDD)" assumes a mutual interaction between body and mind: somatoform pain symptoms are both triggered and sustained by emotional distress (Fink & Schröder, 2019; International Advisory Group for the Revision of ICD-10, 2010; Gureye & Reed, 2016).

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Although the notion of pain as a complex biopsychosocial phenomenon has long been acknowledged (Landa et al., 2012), the psychosocial aspects of pain still receive limited attention. However, several psychosocial and psychodynamic[1] processes might be particularly relevant for the development and maintenance of somatoform pain, and a developing literature has begun to address this. There is evidence that pain is associated with difficulties in adaptive emotion regulation and an increased experience of negative emotions (Okur Güney et al., 2019). Moreover, interpersonal difficulties in the unconscious as well as conscious realm of psychological functioning, an anxious attachment style, or unavailability of significant others in childhood typically occur in SP patients. The traumatic death or serious illness of early caregivers is also frequently reported (Landa et al., 2012). There is also a high prevalence of insecure attachment style and interactional problems (Landa et al., 2012). In general, somatoform pain disorders are strongly associated with adverse experiences in childhood (First et al., 2015). Landa et al. (2012) found that most patients with somatoform pain disorder reported an unfulfilled desire for closeness, which is accompanied by fear of being rejected, hurt, or abandoned. Gaskin et al. (1992) found a link between negative emotions in childhood and somatoform pain. Nasio (2004) also emphasizes the connection between loss, trauma, and physical pain.

Regarding social aspects, Marchia (2023) recently described the role of income comparisons on physical pain, discussing negative emotions as a psychological mediator. The study was conducted against the background of the "Relative Deprivation Theory": Relative deprivation describes the idea that one is worse off than a reference group. It is associated with fibromyalgia and functional gastrointestinal disorders. Above all, negative emotions such as envy, anger, resentment, or hopelessness seem to mediate this relationship. Thus, negative emotions resulting from a disadvantaged position in the income hierarchy could explain the association between income rank and pain (Marchia, 2023). Even in neurobiological research, social rejection has attracted a great deal of attention as a factor that contributes to the experience of pain (DeWall et al., 2012; Eisenberger et al., 2003; Way et al., 2009). Patients have difficulties in perceiving and describing their emotions, and in distinguishing them from bodily sensations (Cox et al., 1994; De Greck et al., 2013; Fink et al., 2007). Chronic, repetitive stress increases pain sensitivity, possibly in the form of stress-induced hyperalgesia (Ahmad & Zakaria, 2015; Jennings et al., 2014; Olango & Finn, 2014). Indications that interpersonal distress and physical pain share neural networks have been found in numerous neurobiological studies (DeWall et al., 2012; Eisenberger et al., 2003; Way et al., 2009). Current biopsychosocial concepts take into account both central and peripheral aspects of increased pain perception. Accordingly, somatoform pain disorder should be conceptualized multi-dimensionally. Thus, for practitioners treating pain-burdened patients, the knowledge of psychosocial dimensions is of crucial importance in the distinction between physical and somatoform pain.

Several questionnaires assess either physical or somatoform pain taking only selective account of the various physical, psychological, and social dimensions of pain. The first group of questionnaires assesses physically induced pain (Nagel et al., 2002), whereas the second group focuses on psychological complaints in patients with predominantly physically induced pain (Geissner, 2001). A third group of questionnaires addresses the physical and psychological complaints of patients with predominantly physically induced pain (Löwe et al., 2002). Finally, a fourth group is concerned with somatoform pain (Rief et al., 1997). As these references apply only to the German population, results might be different on an international level. In summary, instruments that systematically measure psychosocial aspects of somatoform pain are scarce. This hinders the systematic assessment of psychosocial factors of pain, which would be particularly important for psychodynamic and other psychological therapies that are suited to actively incorporate such factors in the treatment of somatoform pain (Abbass et al., 2021; Luyten & Fonagy, 2020). Therefore, the present study aimed to develop a self-report instrument to identify psychosocial aspects of somatoform pain experiences.

Methods

Sample, design, and setting

This is a multicenter cross-sectional study approved by the responsible ethics committees at the University of Lübeck on 13.08.2013, ID: 13-08. The cross-sectional study comprised 200 patients admitted consecutively to the Clinic for Psychosomatic Medicine and Psychotherapy of the University Hospital Kiel, the Segeberger Kliniken, and the Asklepios-Fachklinikum Stadtroda, Germany, with a diagnosis of somatoform pain disorder (F45.40). The interviews were collected from August 2013 to August 2015. All patients who were asked to participate in the study agreed with this participation, gave their informed consent, and were included consecutively in the study. Most patients completed the questionnaire immediately. If they were not able to complete the questionnaire immediately, they were asked to supplement

questionnaires the following days. All questionnaires were filled out completely so that there were no missing values. Diagnosis was made, based on the admission interview, using ICD-10 criteria. This clinical diagnosis was confirmed based on the Structured Clinical Interview (SCID) for DSM IV. The severity of the somatoform disorder was determined by the values in the SOMS questionnaire 2. Inclusion criteria were a minimum age of 18 years and a good command of the German language. Exclusion criteria were the presence of neurological conditions (because of potential problems in completing the questionnaire) and psychotic disorders (because the pain experienced could be of a coenesthetic nature), as well as comorbid eating disorders (because the pain could be due to the consequences of being underweight or osteoporotic changes).

Measures

The SCID Interview served to assess selected psychological disorders as defined on axis I in DSM-IV (Wittchen et al., 1997). In the present study, the diagnosis of somatoform disorder was verified using the SCID-I.

The State-Trait Anxiety Inventory (STAI) is based on the distinction between anxiety as an actual state and anxiety as a character trait (Laux et al., 1991; Spielberger et al., 1970). Based on the calibration sample ($n = 2385$), Spielberger et al. (1970) cite scores between 34.45 and 37.01 as the reference mean for dispositional anxiety (trait), with standard deviations between 8.83 and 9.95. For state anxiety, scores range between 36.83 and 38.08, with standard deviations between 9.82 and 10.29. In the German-validated translation, Cronbach's alpha is between .88 – .94 (trait) and .90 – .94 (state) (Laux et al., 1991).

The Screening for Somatoform Disorders (SOMS-2) questionnaire assesses complaints not due to organic disease. For evaluation purposes, the sum of the questions answered with "yes" is condensed into the "somatizing" complaint index (Cronbach's alpha = .88). A somatizing tendency exists with a complaint index of ≥ 17; in a sample with healthy subjects, the mean score was 5.1 (Rief et al., 1997).

The Beck Depression Inventory (BDI II) is a self-assessment tool for measuring the severity of depressive symptoms in clinical populations. A score of ≥ 18 points suggests a clinically relevant symptomatology. Cronbach's alpha is 0.89–0.93. Scores between 11 and 17 points indicate a mild-to-moderate severity of depressive symptoms (Hautzinger et al., 2008).

The State of Health Questionnaire (SF-36) is a non-disease-specific measuring tool for assessing health-related quality of life. Both a mental and physical sum score can be calculated (Bullinger et al., 1995). We also included the SF-36 Pain Score as a subscale, which is calculated from two items relating to the severity of pain and everyday impairment caused by physical pain over the previous four weeks (range 0–100). Cronbach's alpha for SF-36 subscales in a large range of different populations is typically above 0.7 (Bullinger et al., 1995; Reulen et al., 2006).

Development of the questionnaire for assessing somatoform pain

To develop the questionnaire, we proceeded in two steps. First, in an expert group of six psychologists and physicians, items related to somatoform pain were collected based on clinical experience. All experts had at least 10 years of experience in the field of psychosomatics. The gender ratio among these experts was balanced. When formulating the items, we took into account observations and findings of the literature on psychosocial aspects of pain, as described in the introduction. Against this background, items were developed to cover the following dimensions: emotional and behavioral causes and effects of pain (48 items), positive and negative life conditions (30 items), attitudes toward pain (91 items), and interpersonal aspects related to pain (41 items). This collection process was terminated when the expert group concluded that additional items would not provide any new aspects, i.e. that the item pool was saturated. All items selected use a 4-point Likert response format (e.g.: "I can influence the pain via my thoughts": "Completely true" – "Mostly true" – "Mostly untrue" – "Completely untrue") or dichotomous "yes"/"no" answers (e.g.: "Does the pain radiate?": "Yes" – "No"). The polarity of the items was reversed during the evaluations so that higher values would correspond to higher levels concerning the underlying construct, aiding sum scale score development later on.

In the second step, we rigorously reduced the number of items since the aim was to develop an economical instrument. In this step, the expert panel identified items from the original item pool that could be allocated to unidimensional constructs with potential relevance to somatoform pain according to the theoretical and empirical literature. Against this background, the following constructs were identified: Relationships between pain and negative emotions (5 items); Negative attitudes towards help-seeking (7 items); Negative pain-related childhood experiences (11 items); Negative attitudes towards own body (6 items); Negative aspects of doctor-patient relationship (12 items); and Perceived pain control (7 items).

A third step was conducted for all 200 participants. For each of the six content dimensions summarized above, item analyses were performed. Items with item-total correlations below .7 were deleted, resulting

in 31 items with the following number of items per scale: Relationships between pain and negative emotions (3 items); Negative attitudes towards help-seeking (4 items); Negative pain-related childhood experiences (11 items); Negative attitudes towards own body (6 items); Negative aspects of doctor-patient relationship (3 items); and Perceived pain control (4 items). These scales and items were then subjected to confirmatory factor analysis (see Table 4).

Statistical analysis

Statistical analysis was performed with Stata 15 software. The sample was described using descriptive statistics, with absolute and relative frequencies, means, and standard deviations (SD) being given. T-tests for independent samples were used to test for gender differences as well as to compare the sample data with published standard or comparative data about the tools used. To test the factorial validity of the developed 31-item questionnaire, a dimensional analysis was performed using confirmatory factor analysis using the maximum likelihood estimator. Items were allocated to their respective dimensions according to the item development described above. It should be noted that this validation step was conducted with the same dataset in which the scales were developed. Thus, the validation of the factorial questionnaire structure presented here should be considered preliminary and interpreted with caution. Sum scores were calculated over all items of each scale. To evaluate construct validity, bivariate correlations of the QSP-31 scale scores with quality of life (SF-36), depression (BDI II), and anxiety (STAI) were investigated.

Results

Description of the sample

The sample consisted of 200 patients, 80% ($n = 160$) of whom were women. At the time of data collection, the average age of the sample was 49 years (SD 9.9): the youngest patient was 21, and the oldest was 66. Table 1 shows descriptive statistics of patients and norm or comparison data, as well as *p*-values for independent sample t-tests for comparisons of this data with the study sample for STAI, SOMS-2, BDI II, and SF-36. There were no significant differences between males and females.

As Table 1 shows, both the state and trait anxiety scores (STAI) are significantly elevated compared to those of the norm sample. Likewise, the SOMS-2 Complaints Index is significantly elevated in comparison to a sample with healthy subjects (Green et al., 2011). There are no comparative norm samples for the Beck Depression Inventory (BDI II). According to Hautzinger et al. (2008), a score of ≥18 points suggests a clinically relevant symptomatology. The present sample is therefore just above this cut-off value as well as significantly above the mean value of a group with healthy subjects. Compared to the norm sample, mental and physical quality of life (SF-36) is markedly reduced, and the severity of the pain experienced over the previous four weeks is significantly greater (Bullinger et al., 1995).

Table 2 summarizes the psychometric characteristics of QSP-31 scales at item, scale, and total-score levels. Item-scale correlations as well as the internal consistencies of the scales and total score are consistently high. The intercorrelations between the QSP-31 scales were low to moderate ($r = -.22 - .44$, see Table 3).

The confirmatory factor analysis with six factors had acceptable model fit regarding some indicators (RMSEA: .077, SRMR: .061, both recommended to be < .08) and was somewhat below the recommended thresholds for good model fit for others (CFI: .877, TLI: .864, both recommended to be > .90). Kaiser-Meyer-Olkin measure of sampling adequacy was above .6 for all items. Table 4 shows the factor loading matrix. All factor loadings were > .6 except one item of the Perceived Pain Control Scale: "I can influence the pain via my behavior" (.588).

Table 1. Psychometric data in study sample ($n = 200$) and comparison with norm / comparison samples.

Scale	Min	Max	M	SD	Norms / comparison group	difference
Sample Size *N* = 200						
STAI State	24.00	77.00	53.53	11.44	36.38–38.08[a]	$p < 0.001$
STAI Trait	26.00	77.00	56.10	10.25	34.45–37.01[a]	$p < 0.001$
SOMS-2	0	46	18.81	10.33	5.1[b]	$p < 0.001$
BDI	3	49	19.58	9.21	6.5[c]	$p < 0.001$
SF-36 Mental Sum Score	10.96	64.12	31.21	10.183	50[d]	$p < 0.001$
SF-36 Physical Sum Score	16.35	54.97	34.06	8.23	50[d]	$p < 0.001$
SF-36 Pain	0	84	27.26	16.46	79.08	$p < 0.001$

Legend: Min = Minimum; Max = Maximum; M = Mean; SD = Standard Deviation; STAI = State-Trait Anxiety Inventory; SOMS-2 = Screening for Somatoform Disorders; BDI = Beck Depression Inventory; SF-36 = State of Health Questionnaire; [a]norm sample (24); [b]sample of healthy subjects (22); [c]sample of healthy subjects (26), [d]norm sample (27).

Table 2. Psychometric characteristics of QSP-31 at item and scale level (n = 200).

Item / Scale	Min	Max	M	SD	Med	r_{it}	α
Relationship between pain and negative emotions	**3**	**12**	**8.6**	**2.7**	**9**		**.92**
My pain increases when I get upset	1	4	2.9	1.0	3	.94	
My pain increases when I get angry	1	4	2.9	1.0	3	.96	
My pain increases when I'm frustrated	1	4	2.8	1.0	3	.88	
Negative attitudes towards help-seeking	**3**	**12**	**6.8**	**2.6**	**6**		**.88**
I feel weak when I receive help	1	4	2.4	1.0	2	.81	
I feel ashamed when I receive help	1	4	2.2	1.0	2	.90	
I feel guilty when I receive help	1	4	2.3	1.0	2	.90	
I am not able to accept help	1	4	2.1	0.9	2	.84	
Negative pain-related childhood experiences	**3**	**12**	**6.0**	**2.6**	**6**		**.86**
I received attention	1	4	2.3	1.0	2	.79	
I received comfort and care	1	4	2.3	1.0	2	.82	
They said I shouldn't be so like that	1	4	2.4	1.1	2	.77	
They scolded me	1	4	2.0	1.1	2	.82	
They didn't take me seriously	1	4	2.2	1.0	2	.84	
I wasn't believed	1	4	2.0	1.0	2	.86	
I was given courage	1	4	2.6	1.0	2	.78	
They made fun of me	1	4	1.8	0.9	2	.73	
No one cared how I felt	1	4	1.9	1.0	2	.86	
The others felt burdened by me	1	4	2.0	1.0	2	.74	
Nobody realized how I was feeling	1	4	2.2	1.1	2	.77	
Negative attitudes towards own body	**3**	**12**	**6.8**	**2.9**	**7**		**.87**
Overall, I like my body	1	4	2.3	1.0	2	.77	
I accept my body	1	4	2.1	0.9	2	.78	
I trust my body	1	4	2.1	0.9	2	.72	
I'm disappointed with my body	1	4	2.2	1.0	2	.81	
Sometimes I wish I had a different body	1	4	2.5	1.1	3	.79	
Sometimes I hate my body	1	4	2.1	1.2	2	.81	
Negative aspects of doctor-patient relationship	**3**	**12**	**7.0**	**2.3**	**7**		**.82**
I wasn't taken seriously	1	4	2.4	0.9	2	.84	
I was put off	1	4	2.4	0.9	2	.87	
I was rejected	1	4	2.5	0.9	2	.85	
Perceived pain control	**3**	**12**	**6.0**	**2.1**	**6**		**.81**
I can influence the pain via my body	1	4	2.0	0.8	2	.80	
I can influence the pain via my thoughts	1	4	2.0	0.8	2	.84	
I can influence the pain via my feelings	1	4	2.1	0.9	2	.80	
I can influence the pain via my behavior	1	4	2.5	0.9	2	.76	

Legend: QSP-31 = Questionnaire for Somatoform Pain; Min = Minimum, Max = Maximum, M = Mean, SD = Standard Deviation, Med = Median, r_{it} = item-test correlation, α = Cronbach's alpha.

Table 3. Intercorrelations of the QSP-31 scales ($n = 200$).

		1	2	3	4	5	6
1.	Relationship between pain and negative emotions	–					
2.	Negative attitudes towards help-seeking	.29***	–				
3.	Negative pain-related childhood experiences	.16*	.44***	–			
4.	Negative attitude towards own Body	.09	.40***	.24***	–		
5.	Negative aspects of doctor-patient relationship	.05	.27***	.35***	.21**	–	
6.	Perceived pain control	−.22***	−.02	−.003	.001	.12	–

Legend: QSP-31 = Questionnaire for Somatoform Pain; *: $p < .05$; **: $p < .01$; ***: $p < .001$.

Table 5 shows the bivariate correlations between the QSP-31 scale scores and the STAI, SOMS, BDI II, and SF-36 scores.

For correlations between the QSP-31 scales and the seven scores including anxiety (trait and state), somatization, depression, mental and physical overall health, and pain-related health, 31 out of 42 possible correlations were statistically significant, mostly of moderate effect size, and in the expected direction (Table 5). The highest correlations were found between Negative attitudes towards help-seeking and trait anxiety ($r = .60$) and depression ($r = .55$), and between Negative attitudes towards own body and depression ($r = .50$). The strongest associations with somatization (SOMS-2 score) were observed for Negative pain-related childhood experiences ($r = .36$) and Negative aspects of doctor-patient relationship ($r = .30$).

Discussion

This study aimed to develop a multidimensional assessment of the psychosocial aspects of somatoform pain. Based on an initial item pool and after expert ratings and item characteristics, a questionnaire assessing six dimensions relevant to somatoform pain was developed and subjected to analyses of construct validity based on data from a sample of patients with somatoform pain. Regarding the characteristics of the sample, the elevated scores on the SOMS-2 and SF-36 pain scale supported the validity of the diagnosis of somatoform pain. The reduced physical and mental quality of life (SF-36) matches the findings of a series of studies with patients suffering from somatoform pain (Zonneveld et al., 2013). The results of the STAI, SOMS-2, BDI II, and SF-36 questionnaires reveal that the included sample of patients with somatoform pain disorders had higher state as well as trait anxiety scores, and higher depression symptom levels as compared to norm data/comparison samples, which is also well in line with the literature (Shidhaye et al., 2013; Zheng et al., 2019).

Factor 1 (*Relationships between pain and negative emotions*) reflects the association between negative emotions (anger, stress, frustration) and perceived

Table 4. Factor loadings from confirmatory factor analysis of QSP-31 items.

	Item	Factor 1 Relationship between pain and negative emotions	Factor 2 Negative attitudes towards help-seeking	Factor 3 Negative pain-related childhood experiences	Factor 4 Negative attitudes towards own body	Factor 5 Negative aspects of doctor-patient relationship	Factor 6 Perceived pain control	R^2
1	My pain increases when I get upset	.926						0.858
2	My pain increases when I get angry	.987						0.974
3	My pain increases when I'm frustrated	.762						0.580
4	I feel weak when I receive help		.692					0.479
5	I feel ashamed when I receive help		.905					0.819
6	I feel guilty when I receive help		.901					0.811
7	I am not able to accept help		.737					0.543
8	Childhood experiences with pain: I received attention[r]			.763				0.582
9	Childhood experiences with pain: I received comfort and care[r]			.797				0.635
10	Childhood experiences with pain: They said I shouldn't be so like that			.742				0.550
11	Childhood experiences with pain: They scolded me			.797				0.636
12	Childhood experiences with pain: They didn't take me seriously			.821				0.674
13	Childhood experiences with pain: I wasn't believed			.856				0.732
14	Childhood experiences with pain: I was given courage[r]			.755				0.570
15	Childhood experiences with pain: They made fun of me			.705				0.497
16	Childhood experiences with pain: No one cared how I felt			.853				0.728
17	Childhood experiences with pain: The others felt burdened by me			.711				0.506
18	Childhood experiences with pain: Nobody realized how I was feeling			746				0.556
19	Overall, I like my body[r]				.699			0.488
20	I accept my body[r]				.723			0.522
21	I trust my body[r]				.665			0.442
22	I'm disappointed with my body				.771			0.594
23	Sometimes I wish I had a different body				.742			0.550
24	Sometimes I hate my body				.776			0.601
25	Experience with doctors: Wasn't taken seriously					.726		0.527
26	Experience with doctors: Was put off					.872		0.761
27	Experience with doctors: Was rejected					.721		0.520
28	I can influence the pain via my body						.690	0.475
29	I can influence the pain via my thoughts						.853	0.727
30	I can influence the pain via my feelings						.752	0.566
31	I can influence the pain via my behavior						.588	0.346

Legend: QSP-31 = Screening Questionnaire for Assessing Psychosocial Aspects in Patients with Psychosomatic Pain; [r] items were reverse coded; Fit indices from confirmatory factor analysis: RMSEA: .077, CFI: .877, TLI: .864, SRMR: .061.; R^2: variance of the item explained by the latent factor.

Table 5. Correlations between the QSP-31 scale scores and the STAI, BDI and SF-36 scale scores.

Questionnaire	Factor 1 Relationship between pain and negative emotions *r*	Factor 2 Negative attitudes towards help-seeking *r*	Factor 3 Negative pain-related childhood experiences *r*	Factor 4 Negative attitudes towards own body *r*	Factor 5 Negative aspects of doctor-patient relationship *r*	Factor 6 Perceived pain control *r*
STAI State	.21**	.51***	.43***	.38***	.27***	.06
STAI Trait	.35***	.61***	.32***	.41***	.22**	.05
SOMS-2	.23**	.27***	.40***	.16*	.31***	.08
BDI	.26***	.54***	.42***	.53***	.24***	.08
SF-36 Mental Sum Score	−.26***	−.45***	−.32***	−.33***	−.16*	.06
SF-36 Physical Sum Score	.17*	−.00	−.11	−.02	−.19**	.17*
SF-36 Pain	.04	−.23**	−.14	−.13	−.16*	.16*

Legend: QSP-31 = Questionnaire for Somatoform Pain; STAI = State-Trait Anxiety Inventory; SOMS = Screening for Somatoform Disorders; BDI = Beck Depression Inventory; SF-36 = "State of Health" Questionnaire; *: $p < .05$; **: $p < .01$; ***: $p < .001$.

pain. Indications that interpersonal distress and somatoform pain share neural networks have been found in numerous neurobiological studies (DeWall et al., 2012; Eisenberger et al., 2003; Way et al., 2009). Our findings support the observations of Marty (1968) and other authors that pain may be the result of a disorganizing affective process triggered by a psychological catastrophe (for example Aisenstein & Smadja, 2010). Nasio (2004, p. 27) defined this catastrophe, leading to the state of bodily pain, as the experience of loss. He describes different forms of loss: I lose the loved one brutally (mourning); I lose his or her love (abandonment); I lose the love that I invest in the image of myself (humiliation) and I lose the integrity of the body (mutilation). We propose that these experiences of loss lead to traumatic affects as well as to the following factors, for example the "rejection of neediness" (as defense) or "frustration in the doctor-patient-relationship" (as repetition of a dysfunctional interaction).

Factor 2 (*Negative attitudes towards help-seeking*) presents a psychological conflict: on the one hand, it is known that patients with somatoform pain exhibit marked help-seeking behavior; on the other hand, the state of learned helplessness, avoidance, and social withdrawal also form part of the behavior of these patients (Matheson, 1995). It appears that patients with somatoform pain do not believe that their symptoms might be reduced, or they experience the reaction to their pain as shameful, negative or inappropriate; this would suggest intersubjective difficulties in terms of handling bodily complaints. The same pattern is described by Nissen (2018), who showed that patients who cannot imagine that others are able to process the projected emotions, have to dissipate their affective experiences into painful bodily perceptions. The positive correlation with anxiety and depression or rather the negative correlation with mental quality of life indicates that even though patients with somatoform pain do not feel well psychically, they may struggle to accept help, probably because of their negative transference.

Factor 3 (*Negative pain-related childhood experiences*) shows that particularly in childhood, the patients who scored high on this factor had the impression of not being taken seriously in their experience of pain, or else retrospectively interpreted the reaction of their environment in this manner. References to social rejection and a lack of empathy on the part of their "environment," in some cases even in childhood, are repeatedly made in the literature (Imbierowicz & Egle, 2003; Lackner et al., 2004; Violon, 1985). The childhood experience of not being taken seriously is inexorably repeated in the feelings of shame, guilt and weakness when the patients have to accept the help of others once they've grown up: psychodynamically, this repetition may also take place within the doctor-patient relationship in the form of a transference when the patients don't feel taken seriously or when they feel belittled. The correlations with the psychometric parameters, especially anxiety and depression, show a close connection between remembered negative childhood experiences and negative emotions in adulthood.

Factor 4 (*Negative attitudes towards own body*) reflects the negative attitude to the own body, which is burdened by the experience of pain, and which the patients reject. This negative view of one's own body may probably not only be explained by the current experience of pain but can in some cases also be due to a body relationship or body-image disorder associated with maladaptive body experiences in early childhood attachment problems (Henningsen, 1999, p. 193). Thus, in our study, a negative and disapproving attitude towards the own body correlates with Factor 5.

Factor 5 (*Negative aspects of the doctor-patient relationship*) depicts experiences of visits to the doctor

which can be characterized by devaluation, rejection, and not being taken seriously. From a psychological perspective, this could point towards a typical re-enactment of childhood experiences in the doctor-patient relationship, by provoking a characteristic form of counter-transference (Rudolf, 2006, p. 171), in which doctors are forced to react like irresponsible, rejecting, traumatizing parents. That is the truly uncanny power of countertransference. Nasio (2004, p. 126) suggests that this repetition of the feared but constantly re-enacted loss experience is sustained by the patient's traumatic enjoyment as a variant of masochistic behavior.

Factor 6 (*Perceived pain control*) presents the perceived capacity for handling pain. Previous studies have shown that patients with somatoform pain have a tendency towards cognitive distortions, catastrophizing, hypersensitivity towards the experience of pain (i.e. hyperalgesia), and avoidance behavior (Rudolf, 2006, p. 171). This results in a state of learned helplessness with passive-resigned behavior and the feeling of a lack of self-efficacy. Further, patients often experience pain as uncontrollable (Matheson, 1995). This means that the traumatic process, following for example the experience of loss, cannot be influenced.

All 6 factors show both conscious and unconscious facets of a subjective and intersubjective experience that is related to the experience of somatoform pain. The problems in the doctor-patient relationship (Factor 5) may have to do with the actual powerlessness of the doctors; however, they can also be understood as an expression of a difficult transference/countertransference dynamic that is rooted in the patients' adverse childhood experiences (Factor 4). The difficulties in accepting help (Factor 2) can also be understood in this transference context.

Regarding the construct validity of the six scales of the QSP-31, we (1) assessed the inter-correlations between the six scales, (2) conducted a preliminary confirmatory factor analysis, and (3) assessed associations of these scales with somatic and mental health measures. As could be expected, many of the QSP-31 scales were correlated. For example, Negative pain-related childhood experiences as a rather general environmental factor were associated with all other scales except for Perceived pain control, which was only related to the Relationship between pain and negative emotions. However, there were statistically significant correlations only for nine out of fifteen possible associations between scales, and all correlations between the scales were low to moderate in magnitude. These figures provide evidence that the QSP-31 scales assess rather independent dimensions.

The preliminary confirmatory factor analysis showed an acceptable model fit for some indices, while others were somewhat below the recommended thresholds. This finding is not surprising since many of the established model fit indices are very sensitive to sample size and perform well in moderate sample sizes between $n = 300$ and $n = 700$ (Goretzko et al., 2024). Thus, it is likely that the model fit estimates provided here are a rather conservative assumption given the small sample size. On the other hand, it should be noted that scale development and evaluation should be conducted in independent samples, which was not feasible in this study and therefore probably leads to an upward bias in estimates. Thus, the results of the confirmatory factor analysis should only be seen as preliminary evidence for construct validity, which needs replication in independent, ideally larger samples (Boateng et al., 2018). The same applies to the factor loadings which were overall in a moderate to high range.

Associations of the QSP-31 scales with somatic and mental health measures were largely in line with predictions based on the theoretical and empirical literature. First, all scales except for Perceived pain control were associated with the severity of somatization symptoms, providing further evidence for the relevance of the investigated psychosocial aspects. Perceived pain control not being associated with somatization seems rather unexpected, given the well-documented association between perceived pain control and pain severity (Pellino & Ward, 1998). However, there is evidence that controllability is selectively related to pain-related suffering, but not to pain intensity or pain unpleasantness (Löffler et al., 2018). This is in line with the modest correlation we observed between Perceived pain control and the SF-36 pain score, which assesses pain-related impairment in addition to pain severity. Other salient findings were relatively high correlations between somatization symptoms and both Negative pain-related childhood experiences and Negative aspects of the doctor-patient relationship. The perceived neglect or harsh reactions to the expression of pain in childhood being related to somatization are in line with references to the relevance of social rejection and a lack of empathy perceived in the environment made in the literature (Imbierowicz & Egle, 2003; Lackner et al., 2004; Violon, 1985). Additional studies also show that parental style (e.g. rejection, hostility, emotional unavailability) can be associated with somatization (Lackner et al., 2004). Despite the strong evidence for the major role of childhood experiences in somatic and mental health (Eilers et al., 2023), they are still rarely routinely assessed in somatoform care. Regarding the role of Negative aspects of the doctor-patient relationship, somatization can be associated with

insecure or anxious attachment (Airey, 2022). Thus, such individuals might have trouble trusting others (Landa, 2012), which could negatively impact their interactions with healthcare professionals. From a psychodynamic perspective, this might present a typical re-enactment of childhood experiences in the doctor-patient relationship, shaped by the patient's transference, i.e. "the unconscious assignment to others of feelings and attitudes that were originally associated with important figures" (Stone, 1994, p. 135) and the doctor's unconsciously responding countertransference (by which doctors are forced to react like the irresponsible, rejecting, traumatizing parent). Further, regarding the factor of Negative attitudes towards own body, the described negative view of the patient's body may probably not only be explained by the current experience of pain but may also be due to a body-relationship disorder associated with maladaptive body experiences in early childhood attachment dysfunctions (Bonev & Matanova, 2021).

The study is not without limitations that must be borne in mind when interpreting our findings. To develop a measure, a preselection of the items using statistical and content-related item analysis was necessary. Moreover, the cross-sectional design of the study made it impossible to determine the re-test reliability of the tool. As mentioned above, this procedure is obviously at risk of producing a pattern that is only observable in the present data set. Thus, replication of the questionnaire validation in an independent patient sample is required. Further, it is unclear whether the presented findings are specific to somatoform pain or whether the same patterns would be observed also in populations with medically explained pain. Future studies should therefore include different comparison groups other than healthy individuals. Within this study, the use of further psychodynamic methods was not feasible, but as an outlook, it would be interesting to apply further psychodynamic instruments additionally. Moreover, the use of the SCID-I to verify the inclusion criterion of somatoform disorder can be well justified by its overlap with the ICD concept which was the basis for the admission to this study. However, it neglects the fundamental changes in the DSM-5-TR, so the generalizability of this DSM-5-TR concept of somatic symptom disorder remains unclear. Finally, future studies are needed to investigate whether the questionnaire can be applied to other samples with different demographic and clinical characteristics. Further, it would be interesting to explore Functional Motor and Sensory Symptoms (FMSS) through the psychodynamic perspective and their relation to pain future studies.

Conclusions

The questionnaire developed in this study might be a useful instrument to assess multiple psychosocial aspects relevant to the diagnostics and treatment of somatoform pain after careful validation and possible adaptions to different populations in the future. A clinical implication of the questionnaire could be its potential to enhance the recognition of important psychosocial variables, which may lead to improved care for patients with somatoform disorders.

Note: The questionnaire is available from the lead author's correspondence address.

Note

1. By the addition of "psychodynamic" we mean that the psychosocial dimensions also include preconscious and unconscious aspects such as the transference in the doctor-patient relationship.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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