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Clinical pain research

A multi-facet pain survey of psychosocial complaints among patients with long-standing non-malignant pain

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HIGHLIGHTS

- A measure of psychosocial pain related distress is developed from patient reports.
- Stress-related exhaustion is an important factor in long-standing pain.
- Pain patients often have a negative outlook on the future.

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ABSTRACT

Background and aims: Psychometric inventories and scales intended to measure cognitive, emotional and behavioural concomitants of pain are typically constructed by deducting items from theoretically derived concepts related to pain states, e.g. social support, perceived control, depressiveness, and catastrophizing. The aim of this study was to design a clinically useful, generic pain distress inventory – The Multi-Facet Pain Survey (MFPS) – inductively derived from psychological and social complaints reported by a study group of individuals with severe chronic nonmalignant pain.

Methods: Extensive clinical interviews with hospitalized chronic pain patients were made by clinical psychologists. The purpose was to highlight the patients' pain histories and their beliefs and feelings about the pain, and to determine factors possibly influencing their rehabilitation potential. The types of distress reported were sorted into categories with a procedure similar to content analysis. Distress reports were converted to statements, forming items in a questionnaire, the Multi-Facet Pain Survey.

Results: Our analyses supported a distress structure including 15 categories, or "facets", comprising in all 190 types of psychosocial distress. Ten of the facets denote beliefs about the present condition and aspects of distress experienced in daily life (e.g. cognitive problems); three facets reflect the illness history, and two the patient's views on future prospects. To improve the clinical utility, we shortened the scale into a 53 items inventory. A factor analysis of these 53 items revealed four clinically meaningful factors: (1) stress-related exhaustion; (2) impact of pain on daily life; (3) self-inefficacy in regard to future prospects; and (4) negative experiences of health care. While the second factor represents distress directly related to the pain, the first factor reflects long-term exhaustion effects of the pain condition similar to those seen in individuals exposed to long periods of stress. Items loading in the third factor reflect a pessimistic outlook on the future. The content validity of the scale was explored by predicting and testing correlations between the 15 MFPS facets, and the Symptom Checklist (SCL-90) and the West Haven Yale Multidimensional Pain Inventory (MPI). Some of the MFPS facets showed little or no agreement with any of the subscales of the comparison measures. The homogeneity was satisfactory both for facets and factors.

Conclusions: The Multi-Facet Pain Survey (MFPS) facets cover a broad array of experienced psychosocial distress in patients with severe, longstanding pain. Some facets of psychosocial impact of longstanding pain states shown in the qualitatively derived distress facets, or by the latent factors found in the factor analysis, may complement our understanding of the long-term impact of pain. Consequently, MFPS may improve the assessment of psychological and social complaints and complications in patients with chronic pain.

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Implications: The MFPS will hopefully be an assessment tool supporting the psychological contribution to a biopsychosocial evaluation of patients with severe, longstanding pain. By exposing a broad range of suffering, MFPS may contribute to alternative treatment options and a better prognosis of future rehabilitation.

1. Introduction

The differentiation between acute and longstanding pain has received increasing interest during the last decades [1,2]. In an early phenomenological model, Dworkin et al. [3] described how an acute nociception episode, surviving expected duration, successively receives psychological and social overlays influencing the life situation for affected individuals. Over time the suffering tends to become less directly related to the pain perception, while the cognitive and emotional aspects gain in importance: for instance, catastrophizing ideations related to the pain and its consequences may influence the psychosocial wellbeing. The pain and its concomitants may eventually profoundly alter the behaviour and the social life of the chronic pain patient. It is today generally believed that chronization of pain is a process leading to several complications with vast implication in the afflicted individual's life, and for rehabilitation prospects [4–6].

A large number of psychometric methods have been proposed to assess psychological and social aspects of chronic pain [7]. The first was the McGill Pain Questionnaire (MPQ) in which the type of pain could be described by choosing among descriptors of its sensory, affective, and evaluative qualities, each with several intensity levels [8]. Recent pain tests and questionnaires typically cover a broad range of psychological and psychosocial problems, relying upon theories of non-medical aspects of the chronic pain state. Affective distress, interference with daily activities, social support, and catastrophizing are examples of concepts believed to be relevant to the chronic experience, and items are formulated to assess each of them. One example of a broad-range, widely used method of this type is the West Haven – Yale Multidimensional Pain Inventory (MPI) [9].

Psychometric inventories and scales intended to measure cognitive, emotional and behavioural concomitants of pain are typically constructed by deducting items from theoretically derived concepts related to pain states, e.g. social support, perceived control, depressiveness, and catastrophizing. In the last decades, however, there have been an increasing number of studies using qualitative research methods to better understand the subjective aspects of pain [10–13]. These studies are based upon thorough interviews with individual pain patients. An interesting indication of such methodological reorientation appeared a few years ago when the US Food and Drug Administration [14] launched detailed recommendations on how to construct instruments for patient-related outcome measures. A more careful exploration of patients' reports and even observing the genuine wordings used by patients to characterize their own situation was emphasized to ensure the clinical validity of outcome studies.

In compliance with these recommendations, Stokes et al. reported on the development of a questionnaire for use in the evaluation of clinical trials with chronic back pain patients [15]. They used a combination of qualitative methods to explore the structure of the patients' complaints, resulting in a 26-item scale reflecting problems due to low back pain. Another example of the use of qualitative methods in the construction of pain scales is the Back Pain Attitudes Questionnaire (Back-PAQ), developed by Darlow et al. [16].

Previous attempts to design pain questionnaires inductively derived from explorations of pain patient reports have concerned specific diagnoses, and restricted types of pain complaints. To our knowledge, there is still a lack of a generic pain inventory, mirroring psychosocial and social problems spontaneously reported by patients suffering from chronic pain, and with items directly reflecting the full range of their reported complaints.

The overall aim of this study was to develop a multidimensional patient-centred inventory of psychosocial complaints among patients with severe, longstanding pain states, based upon inductive analyses of patient rapports, rather than upon deductions from theoretical concepts. To accomplish this goal, we first explore distress and complaints reported by patients with longstanding non-malignant pain states, pertaining to their experiences of the pain sensation, different psychological, functional and social consequences and complications associated with the pain condition, as perceived by and communicated by the patient. Next, we evaluate the psychometric properties of a Multi-Facet Pain Survey, based upon the information delivered by chronic pain patients in in-depth interviews.

1.1. Ethics

The research was approved by the Research Ethical Committee at the University of Gothenburg (reg. no. 396-94 800/94 and 337-14).

1.2. Study population and samples

The participants in this study comprise a heterogenic group of patients with non-malignant, longstanding pain problems, mostly of a musculoskeletal origin. For patients taking part in this study, pain complaints were of more than 12 months' duration. Their age ranged from the mid-twenties to the early sixties, and about two thirds were women. They had all experienced various kinds of rehabilitation programmes organized by the Social Security System in Sweden, without lasting success. They were referred to the study site, a hospital with multi-professional pain expertise, because of rehabilitation failures. The aim of the referrals was to propose possible further actions.

Several patient samples were used for the various parts of this study. They are specified as they appear.

1.3. Statistical methods

For the qualitative analysis of interview data, we used an iterative sorting procedure inspired by the method of content analysis [17,18]. For all quantitative analyses (means, standard deviations, Cronbach's alpha, product moment correlations, and explorative factor analysis with Varimax rotation) we used the IBM SPSS Statistics, Version 23.

2. Part I: Patient interviews and qualitative analysis

2.1. Material and methods

Two methods were used to furnish relevant data: one was the written reports based on thorough clinical interviews by a psychologist working at the hospital. The other was transcripts of

interviews performed outside the hospital context. Both interviews encouraged the patients to describe as detailed as possible their current situation, as well as their experiences in the past and their expectations of the future. We supposed that the information obtained along these lines could serve as a solid base for the construction of items in a psychometric inventory. By collecting data from two sources, we aimed at creating a cross-validation procedure, with the overall goal to achieve reliable information about the suffering of patients with long-standing pain.

2.1.1. Clinical interviews

The analysis of clinical interviews was based on written psychological reports from thorough interviews with 18 patients (mean age 42 years, 10 women). The reports were randomly taken from an archive. The sampled patients all belonged to the study population described above. They all had pain since more than a year. These semi-structured interviews were made at the psychologists' offices at the hospital, by clinical psychologists, and served as one of several inputs into a subsequent joint clinical report from the multi-professional hospital team.

2.1.2. Nonclinical interviews

The nonclinical interviews were performed by an external interviewer, in a context entirely separated from the hospital's investigation and documentation programmes. The interviewer was a psychologist with no formal connection to the hospital. Ten patients (mean age 48 years, 9 women) volunteered to participate. They all represented the patient category described above. The interviews were unstructured, inviting the patient to describe freely their types of distress, problems and experiences related to the pain illness, and cautiously prompting for elucidations when necessary.

The nonclinical interviews had a cross-validation purpose. By scrutinizing the transcribed interviews, we hoped to reveal information about types of distress, problems and beliefs not found in the clinical interviews. We also expected to identify patient responses mirroring the categories emanating from the clinical reports. Furthermore, with the help of the transcribed recordings of the interviews, we wanted to approach the patients' own vocabulary when describing their problems, helping us to find ecologically adequate item formulations in the projected questionnaire.

2.1.3. Analysis

The written clinical statements were subjected to a content analysis, where passages (one or several words) carrying information about the patients' experiences, beliefs and feelings about the pain and its wide-ranging consequences was extracted from the statements with a procedure inspired by the method of content analysis [17,18]. The analysis of the statements resulted in a large number of descriptions of a vast array of pain-related circumstances and complaints.

After examining ten written statements, the analyzing process reached a stage where no further relevant information appeared. This was confirmed by a screening of the remaining 8 protocols. Around 250 types of descriptions had at that moment emerged.

After elimination of a few duplicates, some obviously closely related descriptions and a few idiosyncratic formulations, 235 descriptions remained.

2.2. Findings – the multi-facet pain experiences

The descriptions emanating from the analysis of the statements based on the clinical interviews were used in an iterative sorting procedure like that used in content analysis procedures. Diverse ways of sorting were attempted until reaching a categorization of the units that was perceived as optimal, representing a wide array of suffering, impacts on everyday functioning and social consequences. The result of the sorting and resorting manoeuvres was a set of 15 different areas, listed below.

The transcriptions of the nonclinical interviews were searched for codes related to the patients' pain condition and its associated consequences. In sorting these codes the 15 categories from the content analysis of the clinical interviews were used as a "template", in the manner described by King [19]. This process resulted in minor modifications in the descriptions found in the clinical interviews. There was no need to add further categories, and all the 15 categories found in the clinical interviews were represented in the information delivered by the patients during the nonclinical interviews.

Below is a description of the 15 categories, or "facets". After the descriptive name of the facet, we give a few illustrative examples in the form of statements derived from codes constituting the facet. (R denotes reversed coding.)

Facet 1 is called **Iatrogenic beliefs,** because it consists of patients' recollections of information picked up from their earlier contacts with health care deliverers, forming the way they conceive of their pain condition: *I have been told that I will probably not get better; I have been informed that I must continue to reduce the pace of my everyday home-life considerably; I have been told that I have to be very careful with what I do on days so as not to exacerbate the pain.*

Facet 2, **Experiences of treatments and health care providers,** reflects the patients' perceptions and feelings of trust and distrust in their dealings with health care: *I have always been well treated by the health professionals I have met during the time I had my problems (R); It has happened sometimes that I felt mistrusted and not taken seriously when I described my symptoms; I think that everything has been done to provide me with excellent care during my sick leave (R).*

Facet 3, **Symptom changes: Patients' feelings of being successively worse**, contains patient' reports of how they perceive the development of their pain condition, if there are changes in intensity or quality of the pain: *Over the past year, I experience pains from more and more body parts; During the past year, I have felt increasingly tired and decrepit; During the past year, periods of strong pains occur more often.*

Facet 4, **Pain perception and pain impact: Intensity and pervasiveness of the pain,** is based on patients' reports of how intense and devastating they perceive their pain: *It happens sometimes that the pain is gone an hour at a stretch (R); Any physical exertion increases the pain; I am tormented constantly by my pains, around the clock.*

Facet 5, **Pain associated complaints**, comprises reports of diverse bodily problems felt to be related to the pain condition: *I am bothered by noise and loud sounds; I am bothered by palpitations; I am bothered by nausea.*

Facet 6, **Affective complaints,** denotes dysphoric or anxious feelings: *I often feel restless and uneasy*; *I often feel pessimistic about the future; I often feel misunderstood.*

Facet 7, **Cognitive problems,** like difficulties remembering, concentrating, and thinking: *I often find it difficult to remember things*; *I often find it difficult to gather thoughts on what I read in newspapers and books; I often find it difficult to implement something that requires concentration and* psychological *exertion.*

Facet 8, **Vitality: Various signs of tiredness, exhaustion and insufficient energy:** *It often feels like my physical strength is exhausted;* I am often tired without any reason; It often feels like my body is worn out.

Facet 9, **Sleep problems:** *I often feel anxious and restless* at *nights*; It *often happens that I have to get up and move around at night.*

Facet 10, **Impact on behaviour: Disturbances of everyday functioning**. Here are reports of what the pain prevents them from doing, and what precautions they must take to handle the pain: *My pain is influenced by almost everything I do;* often I am sitting or

lying down, resting most of the day; *I can no longer perform everyday activities at home without the help of others.*

Facet 11, **Impact on close relationships,** reports on concerns they perceive from their family: *My next of kin are worried that my condition will worsen*; *My next* of kin consider my health to be too detrimental for any occupational undertaking again soon.

Facet 12, **Psychosomatic conceptions: Ideas about possible psychological or social correlates or causes:** *Personal and family problems may sometimes induce a worsening of the pain*; *I believe that the pain may be affected by matters unrelated to the purely physical*; *The pain I suffer is sometimes affected by how I feel on the spiritual plane.*

Facet 13, **General prospective beliefs about the pain condition**, beliefs concerning what will happen with their pain condition in the future: *I have gradually concluded that there is very little you can do yourself to change your situation; It often feels like I'm never going to feel refreshed and strong again; As it is now, I am totally dependent upon medical care in order to be ameliorated.*

Facet 14, **Professional prospects.** Thoughts about their future possibilities having a job: *When I look ahead, I see a series of obstacles and difficulties which imply that I probably will not manage a job; Due to the pain, I would feel better if I did not have to work outside during the coming year; In the near future, it is more important for me to try to arrange a good life at home than to try to get a job outside the home at all costs.*

Facet 15, **Sick role prospects.** This facet pictures their expectations about their future possibilities of playing an active role*: There is a notable risk that new training or work attempts will fail; Continued financial compensation from the insurance fund, would probably offer a good solution for me, as I feel right now.*

3. Part 2: The test construction

3.1. Material and methods

The pool of different complaint descriptions emanating from the qualitative analyses of clinical and non-clinical interviews, were scrutinized to be converted into test items. Because we wanted a graded response format, we excluded a few of them because they were conceptually bipolar; the rest were formulated as statements, to be accepted or not accepted, to varying degrees. When formulating these statements, we relied on the transcriptions of the non-clinical interviews, making use of authentic patient wordings when possible. There were in all 190 statements, unevenly distributed over the 15 facets, from six in Facet 6 to 23 in Facet 10 (see Table 1). Before determining the exact response format, we compared two alternatives, one with four levels (the statement being Not at all, Quite badly, Quite good, or Completely in agreement with their self-perception), and one with five levels, with a neutral middle alternative, "Neither good nor badly". We distributed the 190-item form to a small patient group ($N = 58$), with 36 answering the items with a 5 levels response alternative, while the others were answering the alternative without a middle "neutral" level. The five levels alternative tended to generate bipolar response frequency distributions, for several items where the middle alternative attracted fewer responses than the surrounding ones; therefore, we decided to use the four levels format alternative.

3.2. Reduction of scale size

Because the large initial version of the scale, now called the Multi-Facet Pain Survey, Large version (MFPS-L) is probably too time-consuming in most clinical settings, we decided to develop a shortened version (MFPS-S), maintaining the facet structure but with fewer items (at least two) representing each facet. One main criterion we used for selecting an item was its correlation to the rest or the items in a facet. Another criterion, recommended by Kline (1979, p. 292) (16) was to avoid too high correlations ($r > .70$) between selected items, and a third criterion was to select items covering the whole scope of the domain represented by the facet. The aim of the selection procedure was to preserve the measurement target of each facet, which should be reflected in high correlations between the original and the shortened facet versions. So, while all selected items had satisfactory item-total correlations, some items with high item-total correlations were not included in the reduced version. This selection procedure, of course, was of a partly subjective character. One important goal with our choice of items for the shorter version was to avoid the danger of maximizing the internal consistency at the cost of the breadth of the scale [20]. The weighing together of the three criteria resulted in different number of items in the facets, both in absolute numbers and in relation to the number of items in the facets of in the large version. The total number of items was reduced from 190 to 53.

Table 1
Means, SD: s and Cronbach's alpha of the 15 facets before and after item reduction.

Facet no.	Number of items: large; short	Large version *M* (SD); Alpha ($N = 125$)[a]	Short version *M* (SD); Alpha ($N = 346$)[a]
1	15; 3	2.63(.49); $\alpha = .59$	2.27(.87); $\alpha = .74$
2	14; 4	2.60(.55); $\alpha = .83$	2.51(.70); $\alpha = .78$
3	8; 3	3.29(.63); $\alpha = .87$	3.12(.78); $\alpha = .77$
4	16; 5	2.99(.53); $\alpha = .88$	3.07(.62); $\alpha = .73$
5	8; 4	2.32(.72); $\alpha = .83$	2.23(.78); $\alpha = .70$
6	22; 4	2.43(.67); $\alpha = .91$	2.46(.80); $\alpha = .81$
7	8; 3	2.59(.81); $\alpha = .93$	2.73(.95); $\alpha = .89$
8	9; 3	3.13(.68); $\alpha = .90$	3.09(.82); $\alpha = .84$
9	8; 2	2.84(.67); $\alpha = .83$	2.67(.93); $\alpha = .68$
10	23; 6	2.90(.54); $\alpha = .91$	3.17(.57); $\alpha = .80$
11	6; 2	3.10(.57); $\alpha = .71$	2.81(.82); $\alpha = .65$
12	13; 4	2.43(.61); $\alpha = .88$	2.54(.82); $\alpha = .82$
13	17; 5	2.54(.49); $\alpha = .83$	2.65(.54); $\alpha = .52$
14	11; 3	2.64(.63); $\alpha = .86$	3.05(.83); $\alpha = .82$
15	12; 2	2.88(.59); $\alpha = .88$	2.99(.83); $\alpha = .59$

The table presents number of facet items in original 190 items and in shortened 53 items versions, and means and standard deviations together with Cronbach's alpha coefficients for large and shortened versions.

[a] Due to list wise deletion, missing data reduces the *N* for some facets when calculating alpha values.

3.3. Description and homogeneity of the facets

The 190 items scale, with the selected 4 level response format, was administered, in a computerized version [21], to 125 pain patients. Their mean age was 47 yrs.; 92 were women. Data for the shortened 53 items version were in the same manner collected from a sample of 346 patients ($N = 346$; mean age 43.8 yrs., 67% women; data on age and gender were missing for 62 patients in this group). Both samples were representative for the patient pool described above (section 1.2). Facet means and standard deviations were calculated both for the original large scale, and for the reduced facets of the shortened 53 item version. These data are reported in Table 1 together with number of items in each facet before and after the shortening of the scale. Cronbach's Alpha was calculated for the 15 facets both in their large and shortened version, from the MFPS data collected from the two patient samples ($N = 125$ and $N = 346$). All alpha values are shown in Table 1.

3.4. Face validity

We administered the test to a small group of patients, asking them to make notes of formulations that seemed awkward or hard to understand; the patients reported no problems understanding

Table 2a
Predicted and calculated correlations between MFPS facets and SCL-90.

	SCL-90									
MFPS facets	SOM	OC	IP	DEP	ANX	HOS	PHOB	PAR	PSY	GSI
1 Iatrogenic beliefs	–	–	–	–	–	–	–	–	–	–
2 Exper. of treatment	++ .46**	–	++ .40**	–	–	–	–	–	–	– .34*
3 Symptom changes	++ .48**	–	–	+	–	–	–	–	–	+ .32*
4 Pain impact	+	–	–	+ .44**	–	–	–	–	–	+ .38*
5 Assoc. complaints	++ .62***	– .54***	–	–	+ .33*	–	– .33*	–	–	++ .47**
6 Affective complaints	–	–	+ .36*	++ .52**	++ .45**	+ .45**	–	–	–	++ .48**
7 Cogn. complaints	– .41**	++ .51**	–	–	–	–	–	–	–	–
8 Vitality	++ .52**	– .40**	–	+ .36*	– .34*	–	–	–	–	++ .46**
9 Sleep problems	–	–	–	+	–	–	–	–	–	–
10 Behavioural impact	+	–	–	+	–	–	–	–	–	+ .32*
11 Relational impact	–	–	–	–	–	–	–	–	–	–
12 Psykosom. beliefs	–	+ .32*	++ .45**	+ .33*	+ .33*	+	+ .43**	++ .33*	++ .44**	++ .44**
13 Prospective beliefs	+	–	–	++ .42**	–	–	–	– .34*	–	+ .36*
14 Professional beliefs	+	–	–	+ .34*	–	–	–	–	–	+
15 Sick role beliefs	+	–	–	+	–	–	–	–	–	+

The table gives predictions of correlation (+ denotes moderate expected correlation, ++ large correlation and – no expectation of a significant correlation) between each facet and SCL 90 variables: SOM = Somatization, OC = Obsessive compulsive, IP = Interpersonal sensitivity, DEP = Depression, ANX = Anxiety, HOS = Hostility, PHOB = Phobic anxiety, PAR = Paranoid ideation, PSY = Psychoticism. GSI is the Global severity index. The actual significant correlation for a group of patients (N = 41) appears below the predictions (*$p < .05$, **$p < .01$, ***$p < .001$).

or accepting the statements. Internal missing item responses were few, amounting to less than 1%.

3.5. Construct validity

To explore the construct validity, we compared the MFPS-S to existing tests with relevance for our patient group. We chose the following tests:

The Symptom Checklist (SCL-90) [22]. The SCL-90 is a widely used, 90 item screening scale measuring a broad range of psychological distress. It also gives over-all measures of symptom load. The SCL-90 was chosen because several of the types of pain suffering reflected in the MFPS facets may be related to general psychological distress. We compared the facets of the MFPS with the total SCL-90 measure GSI (Global Severity Index; grand mean), and with the nine primary SCL-90 subscales: Somatization, Obsessive-compulsive, Interpersonal sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation, and Psychoticism.

The Multidimensional Pain Inventory (MPI) [9,23]. The MPI is since almost 50 years the probably most used inventory for the assessment of social, psychological and behavioural concomitants of pain. It is composed of 61 items, deducted from contemporary concepts of behavioural and psychological aspects of pain. We compared to the MPI subscales: Pain severity, Interference (perceived impact of the pain upon everyday activities), Life control, Affective distress, Support, and three types of responses to pain signals from significant other (Punishing responses, Solicitous responses, Distracting responses). We excluded the third part of the MPI (assessing activity levels) because it has not proven psychometrically satisfactory in its Swedish version [24].

The predictions were made by the first author, who was responsible for the categorization of the separate patients' complaints into the facets, described above. His understanding of the facets and his familiarity with the comparison measures (MPI and SCL90) formed the basis for his predictions of the presumed relationships between MFPS and the two established scales. For each facet, he made an estimate of the correlation with the subscales of the MPI and the SCL-90, whether strong (++), moderate (+), or none (–).

Subjects were 41 patients, emanating from the patient pool described above (section 1.2), with a pain durations of 15–60 months, and a mean pain duration 47.7 months. Mean age was 44.6 yrs., 29 were women. They were given the three scales (MFPS, MPI and SCL-90), and Pearson correlations were calculated between the MFPS facets and the MPI and SCL-90 subscales.

Tables 2a and 2b show for each of the MFPS facets, thee predicted degree of correlation with the SCL-90 and MPI dimensions: + denotes a somewhat weaker, and ++ a somewhat higher expectation; a – sign indicated no expectation of a significant correlation. In the table cells, we also report all emerging significant correlations, with * denoting significance level $p < .05$, ** $p < .01$ and *** $p < .001$.

Table 2b
Predicted and calculated correlations between MFPS facets and MPI subscales.

	MPI							
MFPS facets	PS	I	LC	AD	S	PR	SR	DR
1 Iatrogenic beliefs	–	–	–	–	–	–	–	–
2 Exper. of treatment	–	–	–	+	–	–	–	–
3 Symptom changes	+	+	–	+	–	–	–	–
4 Pain impact	++ .62***	++ .46**	–	+	–	–	–	–
5 Assoc. complaints	–	–	–	–	–	–	–	–
6 Affective complaints	–	–	– –.34*	++ .38*	–	–	–	–
7 Cogn. complaints	–	– .31*	–	–	–	–	–	–
8 Vitality	–	+	–	+	–	–	–	–
9 Sleep problems	+ .47**	+ .44**	–	+	–	–	–	–
10 Behavioural impact	+ .36*	++ .57**	–	+	–	–	–	–
11 Relational impact	–	–	–	–	++ .49**	–	++ .43**	+ .40**
12 Psykosom. beliefs	–	–	– –.35*	+	– –.42**	–	–	–
13 Prospective beliefs	++ .43**	++ .35*	–	+	–	–	–	–
14 Professional beliefs	+ .59***	+ .35*	–	+	– .31*	–	–	–
15 Sick role beliefs	+ .52**	+	–	+	–	–	–	–

The table gives predictions of correlation (+ denotes moderate expected correlation, ++ large correlation and – no expectation of a significant correlation) between each facet and MPI variables: PS = Pain severity, I = Interference, LC = Life control, AD = Affective distress, S = Support, PR = Punishing responses, SR = Solicitous responses, DR = Distracting responses. The actual significant correlation for a group of patients ($N = 41$) appears below the predictions ($^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$).

3.6. A factor analytic exploration

As a complement to the extraction of the 15 facets, based upon a clinical understanding of pain complaints, we decided to explore the dimensionality of the MFPS with factor analysis. We used for this purpose test data from the same patient group as used above for the alpha values of the condensed version of the test ($N = 346$; mean age 43.8 yrs., 67% women; data on age and gender were missing for 62 patients in this group). The scree plot allowed a four-factor solution. We used Varimax rotation to extract these four factors, with Eigenvalues 12.43; 5.16; 2.95 and 2.11, respectively. Together, they explained 42.73% of the total variance.

Table 3 lists all items with factor loadings of .50 or higher, in each of the four factors. Support for the significance of such a loading size is found in e.g. Hair [25]. The number in brackets after an item text is the facet to which the item belongs. Notes are made of items also loading in another factor.

3.6.1. Factor interpretations

In labelling the factors we rely on items loading .60 or higher, while items with loadings between .50 and .60 are considered for supportive purposes. Four items (two in Factor 1, one in Factor 3 and one in Factor 4) had too close loadings in other factors and were not considered in the factor labelling. Items with loading in some other factor within the criterion difference .20, were not considered in the labelling process.

Factor 1: *Stress-related exhaustion.* Most items in this factor reflect possible long-term effect of a stressful pain problem. The items contributing to the labelling emanate from Facet 12, reflecting beliefs that other than somatic factors are responsible for their suffering. Other facets contributing are 5, 6 and 7, dealing with other somatic complaints than pain, and affective or cognitive problems.

Factor 2: *Impact of pain on daily life.* Items loading in factor 2 deal with the direct negative impact of the pain upon life quality and behaviour. Contributing facets are 10 (Impact on behaviour) and 4 (Pain perception and pain impact).

Factor 3: *Self-inefficacy* in relation to pain and prospects. Items loading in this factor reflect a pronounced pessimism regarding future development and consequences of the pain. Items come from Facets 14 (Professional prospects) and 15 (Sick role prospects).

Factor 4: *Negative experiences of health care.* Corresponds totally to Facet 2 (Experiences of treatments and health care providers).

3.6.2. Factor based scores

Factor based scores were calculated as the individual means of items with factor loadings .60 or higher. The correlations between these scores are shown in Table 4. The Table also shows Cronbach's alpha for the four factors, based on items loading .60 or above.

The intercorrelations are near zero except for a significant positive correlation between factors 2 and 3, suggesting a connection between pain suffering and a negative outlook on the future pain condition.

Table 3
Results of a four-factor solution of MFPS item data ($N = 364$).

Loading	Item, facet origin; R = reversed
Factor 1	
.71	25. The pain I suffer is sometimes affected by how I feel on the spiritual plane. (12)
.69	23. Personal and family problems may sometimes induce a worsening of the pain. (12)
.65	41. I am often tired without any reason. (8)
.64	24. I believe that the pain may be affected by matters unrelated to the purely physical. (12)
.64	37. I often find it difficult to implement something that requires concentration and psychological exertion. (7)
.62	31. I often feel restless and uneasy. (6)
.62	35. I often find it difficult to remember things. (7)
.59	36. I often find it difficult to gather thoughts on what I read in newspapers and books. (7)
.58	40. It often feels like my physical strength is exhausted. (8) *(also loading .56 in Factor 2)*
.57	44. During the past year I have felt increasingly tired and decrepit. (3) *(also loading .52 in Factor 2)*
.56	27. I am bothered by noise and loud sounds. (5)
.55	34. I often feel dissatisfied with myself. (6)
.55	22. I believe there may be several factors that contribute to my pain. (12)
.55	28. I am bothered by palpitations. (5)
.54	43. Over the past year, I experience pains from more and more body parts. (3)
.52	29. I am bothered by nausea. (5)
.52	38. I often feel anxious and restless at nights. (9)
Factor 2	
.67	14. I am tormented constantly by my pains, around the clock. (4)
.66	11. I often have to interrupt what I'm doing because the pain increases. (10)
.66	9. My pain is influenced by almost everything I do. (10)
.60	13. Any physical exertion increases the pain. (4)
.57	45. During the past year, periods of strong pains occur more often. (3)
.57	12. The pain becomes much worse whenever I place stress on my body, although I do not strain myself much. (4)
.56	8. A large part of the day is spent taking care of myself to keep the pain down. (10)
.56	7. There is a lot that I must refrain from doing in order to avoid worsening the pain. (10)
.54	15. I can no longer perform everyday activities at home without the help of others. (10)
.53	10. Often I am sitting or lying down, resting most of the day. (10)
Factor 3	
.71	50. When I look ahead, I see a series of obstacles and difficulties which imply that I probably will not manage a job. (14)
.67	49. There is a great risk that new training or work attempts will fail. (15)
.62	53. Continued financial compensation from the insurance fund, would probably offer a good solution for me, as I feel right now. (15)
.57	51. Due to the pain I would feel better if I did not have to work outside during the coming year. (14)
.57	46. I have been told that I will probably not get better. (1)
.57	26. When I look ahead a year in time, I think I will feel better than I do today. (13R)
.52	32. I often feel pessimistic about the future. (6) *(also, loading .42 in Factor 1)*
.51	16. I have gradually concluded that there is very little you can do yourself to change your situation. (13)
Factor 4	
.73	3. I think that everything has been done to provide me with excellent care during my sick leave. (2R)
.70	4. I think that everything has been done to investigate the cause of my pain. (2R)
.70	1. I have always been well treated by the health professionals I have met during the time I had my problems. (2R)
.60	2. It has happened sometimes that I felt mistrusted and not taken seriously when I described my symptoms. (2)
.50	33. I often feel misunderstood. (6) *(also, loading .48 in Factor 1)*

The table lists, for each of four factors, items with loadings greater than .50. After item texts are the number of the facet where the item belongs; *R* denotes reversed coding. Remarks are made if an item loads in another factor with a difference less than .20.

Table 4
Factor based scores: internal consistency and intercorrelations.

Factor no.	Cronbach's alpha	Correlation with factor		
		1	2	3
1	.83			
2	.79	.17		
3	.77	.18	.52	
4	.78	.19	.12	.01

Both Cronbach's alpha and intercorrelations are based on factor loadings of .60 or higher.

4. Discussion

In this study, we explored pain complaints spontaneously reported by patients with severe, longstanding, non-malignant pain conditions. The separate complaints could be sorted into 15 categories ("facets"), representing a wide array of problems accompanying the life with pain suffering. These complaint reports could be converted into 190 statements, to be used as items in a questionnaire with a four-level response format. For practical reasons, this (too) large scale was reduced to a 53 items version, where the facets corresponded as closely as possible to their larger origins. Both the original scale and its shortened version showed satisfactory facet homogeneity.

The identification and naming of the fifteen facets reflect an experienced psychologist's understanding of chronic pain. Some facets are more expected than others, like various aspects of pain perceptions and pain impact (Facets 3, 4, 10 and 11). Several pain scales measure sensory aspects of pain perception, and/or how the pain interferes with everyday life (e.g. [8,9]). There are also various familiar aspects representing side-effects, like sleep problems, cognitive and affective problems (Facets 5, 6, 7, 8 and 9); affective problems are often focused in pain states, and sleep disturbances are measured in e.g. the Brief Pain Inventory Short Form [26]. On the other hand, cognitive disturbances of the type included in Facet 7 are less often seen in pain scales. Less foreseen were facets mirroring beliefs about the future (Facets 13, 14 and 15), beliefs reflecting the patients' interpretations of what they had been told during their health care career (Facet 1), and negative experiences of health care episodes (Facet 2). However, some of the content of these factors has some bearing on the concept of catastrophizing, e.g. as it appears in a subscale of the pain coping scale CSQ [27]. Also, somewhat unexpected was the beliefs expressed by some patients that their pain reflected psychological or social problems (Facet 12). While most of the facets (4–11) describe the patients' present situation, three facets (1, 2 and 3) deal with the past, and three concerns expectations of the future 13, 14 and 15).

We used an inductive strategy, where test items corresponded to patient reports in both clinical and non-clinical interviews. This strategy should favour the external validity of the assessment, and lead to face validity experienced by the patients answering the test. Such hopes are supported by patients' acceptance of the item formulations, and by the minimal number of unanswered items.

To relate the facets to established measures we predicted the association to two existing measures, the SCL-90 and the MPI. The predictions made reflect the clinical judgement by a psychologist with many years clinical work with chronic pain patients (LP). The predictions, expressing three levels of supposed association between a facet and the SCL-90 and the MPI variables, were subsequently compared to empirical correlations obtained from a patient group ($N = 41$) answering both SCL-90, MPI and MFPS. The interpretation of these results must be cautious because of the limited group size. However, the agreement of the predictions with the empirical findings is rather good. For the SCL-90, the only major deviations are for the obsessive-compulsive dimension, showing unpredicted

significant correlations with Facets 5 and 8. For MPI, the major mismatch is for the MPI variable Affective Distress, where predictions of associations were made for about the same facets as were predicted for the SCL-90 variable Depression. But while the predictions were mainly correct for the SCL-90 Depression, only one facet (no. 6, Affective Complaints) showed a correlation with the MPI Affective Distress variable. Probably, the prediction was based upon an overestimation of the validity of MPI Affective Distress as a measure of depression.

One of the facets (1, Iatrogenic beliefs) showed no association at all (predicted or empirical) with the two comparison assessment measures. We believe that this aspect represented by this facet is important because it may affect a patient's conception of his disease state. It has been shown that what a doctor say to a patient about his/her pain often has a dominating role for the way the patient conceives of his/her condition [28].

When comparing the MFPS with MPI, 6 out of the 15 facets have no or only minor associations. MFPS obviously covers a broader range of pain-related phenomena in patients with long-standing pain. Given the breadth of information available in our MFPS data, we judged it interesting to further explore the dimensionality of the instrument factor analytically.

To find possible overarching dimensions behind the MFPS items we made an explorative factor analysis. Four factors were extracted. Item loading cut-off was set at .50; however, the interpretation of the factors mostly relied on items loading .60 or higher. Items with loadings in another factor within the difference criterion .20 were not considered in the interpretation, nor were they included in the calculations of factor based scores.

The first two factors represent experiences of pain, impact of pain and consequences or pain. *Factor 1* holds a wide spectrum of what is long-term consequences of living with a devastating and stressful condition. Many of the items loading in this factor reminds of conditions labelled burn-out or exhaustion syndrome [29]. In this factor are also found items concerning dysphoric reactions, and probably dysphoria-related thoughts of psychological or social factors affecting the pain.

The relationship between Factor 1 and "exhaustion syndrome" and similar diagnoses can be illustrated when comparing it with the diagnostic criteria for the condition Exhaustion syndrome ("Utmattningssyndrom"), established by the Swedish National Board of Health and Welfare [Socialstyrelsen] [30]. Among the criteria requested for the diagnosis are at least four the following six symptoms, with a minimum continuous duration or two weeks: *Difficulty concentrating or memory impairment; Significantly reduced ability to manage claims or to do things under pressure; Emotional lability and irritability; Sleep disturbance; Substantial bodily weakness or fatigue; Physical symptoms such as pain, chest pain, heart palpitations, gastrointestinal symptoms, dizziness and sound sensitivity*. Among items loading in Factor 1 are several reflecting symptoms like these. Patients scoring high on items loading in Factor 1 might probably be diagnosed as suffering from exhaustion syndrome. This might be important for treatment and rehabilitation planning.

While Factor 1 represents indirect effects appearing after an extended period of pain, *Factor 2* mirrors the immediate perception of pain, and the perceived impact of pain on the daily life. Factor 2 is composed mainly of items from Facets 4 (Pain perception and pain impact: Intensity and pervasiveness of the pain) and Facet 10 (Impact on behaviour: Disturbances of everyday functioning). Factor 2 can be seen as a combination of the rather highly intercorrelated MPI variables *Pain Severity* and *Interference* [9].

A few items showed loadings above .50 in two factors. In Factor 1, two items had almost as high loadings in Factor 2: "It often feels like my physical strength is exhausted" (item 40), and "During the past year, I have felt increasingly tired and decrepit" (item 44). Otherwise, the separation between the two factors is indicated by a near zero correlation.

Factor 3 reflects various aspects of a pessimistic view of one's own possibility to manage the situation and change it into the better, a pronounced "self-inefficacy". The factor is dominated by items from Facet 14 (Professional prospects) and Facet 15 (Sick role prospects). Almost all the eight items with loadings > .50 in this factor refer to a pessimistic outlook on the future; the factor carries with it a depressive tone. Chronic pain has previously been associated with a negative view on one's own future [31,32]. Clinically, pronounce pessimism about one's prospects, both generally and regarding the pain and its consequences, can jeopardize the meaningfulness of any rehabilitation efforts. Therefore, the pain patient's negative conceptions about the future could be an important therapy target.

Factor 4, relying exclusively upon Facet 2 (Experiences of treatments and health care providers), describes a pain patient's perception of her/his transactions with health care and health care deliverers. High scores on items loading in the factor depicts a kind of mistrust, with the patient feeling that too little has been done to treat the pain and to investigate its causes, experiences of having been maltreated and misunderstood. The conceptual importance of such aspects of the pain suffering is mirrored by both the qualitative and the numeric analyses of the multitude of complaints and beliefs forming the basis of this study. Theoretically, negative attitudes towards health care emanating from an unfortunate mismatch between the patient's expectations and the health care reality, may be deducted from Craig's Social Communication Model of Pain [33,34].

In this study, we first explored the multitude of psychological and social complaints, problems, and beliefs among chronic pain patients. Next, we converted the qualitative information into a psychometric inventory, meant to give a broad description of the individual patient's distress pattern. We believe that the inductive strategy promotes the ecological validity of the instrument, minimizing the risk of missing important aspects of pain suffering. The scope of the instrument corresponds, we believe, to the professional responsibility of a psychologist as a member of an interdisciplinary team working with diagnosis and rehabilitation planning for patients with severe, longstanding pain. The MFPS covers issues not usually included in pain scales, e.g. pessimistic outlook on the future, and negative experiences of health care and health care deliverers. This may give valuable openings to psychological judgements and actions.

This study has limitations, e.g. in the scope of psychometric issues covered. The MFPS should be evaluated with other patient samples and in other settings. Further aspects of reliability and validity are to be explored, and the ability of MFPS to predict the outcome of rehabilitation should be established.

Ethical issues

The research was approved by the Research Ethical Committee at the University of Gothenburg (reg. no. 396-94 800/94 and 337-14). Study protocol was not published beforehand. Informed consent was obtained from all participants.

Conflicts of interest

None.

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