Psychosocial Functioning Questionnaire for Patients with Low Back Pain: development and psychometric properties

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Abstract

Background: Low back pain (LBP) is a common chronic disease causing pain and severe imitations in mobility. Apart from physical impairment, LBP also affects psychosocial functioning in such domains as interpersonal relationships, emotions or everyday-living activities. In Poland there is a relative lack of tools evaluating the psychosocial functional status in patients with LBP.
Objective: The objective of the study was to develop and test psychometric properties of a new instrument measuring dimensions of psychosocial functioning in patients with LBP – *Psychosocial Functioning Questionnaire (PFQ) for Patients with Low Back Pain*.
Subjects and methods: 100 subjects with LBP took part in the study and completed the initial version of PFQ. A subgroup of 30 random patients was tested with PFQ again after 72 hours.
Results: Factor analysis revealed five factors explaining 43% of the total variance. After deleting items with inadequate psychometric properties, the factors were taken to construct five subscales of PFQ: 1. *Distress in interpersonal context*; 2. *Limitations in everyday functioning*; 3. *Acceptance of life with the disease*; 4. *Depressive complaints*; and 5. *Sense of being disabled*. Intercorrelations between the subscales ranged from 0.36 to 0.69 and showed an expected pattern. Internal consistency coefficients for the subscales ranged from 0.86 to 0.89, and test-retest correlations ranged from 0.80 to 0.90. None of the subscales showed statistically significant associations with such sociodemographic variables as age, gender, marital status, place of residence or duration of the disease. Scores of one subscale – *Acceptance of life with the disease* – differed significantly in subgroups with various educational levels.
Conclusions: PFQ is a reliable questionnaire which could be a useful instrument in evaluation of psychosocial functioning in patients with LBP. Further research is needed to assess other psychometric properties of PFQ.

Key words: functional status, psychological disability, psychometric measurement.

Introduction

LBP is a common chronic disease whose primary symptom is pain affecting the lower part of the back. The main cause for LBP is a strain of the muscles or other soft structures connected to the vertebrae. The exact location of the injury may differ in various individuals. The most important consequence of the pain is serious limitations in mobility [1]. However, the effects of this disease are not confined only to somatic functioning. LBP exerts a debilitating impact also on patients' psychosocial functioning [2].

AMS

Konrad Janowski, Joanna Kuryłowicz, Stanisława Steuden

Psychosocial functioning includes such LBP-relevant domains as keeping social contacts and satisfying relationships with others, maintaining positive self-esteem and positive affect, fulfilling social roles (e.g. work) and family duties, satisfaction with one's life situation, independence in satisfying one's own needs [3]. For many patients with LBP, decrements in their everyday social and personal functioning due to the disease are as important as the occurrence of pain symptoms or limitations in mobility.

It has been recognized that the adequate assessment of a patient with LBP, beside the standard physical examination and necessary laboratory tests, should also include appraisal of psychosocial functioning [4, 5]. It has been emphasized that the severity of pain and other LBP symptoms is significantly related in a feedback loop to various psychological factors including stress, social relationships or depression [6, 7]. It is well documented that improvement in the patient's psychological state correlates with improvement in their physical symptoms [8]. Therefore, inclusion of evaluation of psychosocial functioning into standard examination procedures should be regarded as essential for securing effective treatment for patients with LBP [9].

The recognition of the significance of the psychosocial functioning status in patients with LBP raises the question of how to evaluate it objectively. Although the methods of evaluation of physical impairment are in abundance [10, 11] and are common knowledge and practice, the tools to assess psychosocial functioning are lacking in Poland. This gap is striking in comparison to other countries where numerous questionnaires assessing psychological and functional disability in LBP are commonly utilized [12]. In this paper we present a new instrument designed to evaluate social functioning in LBP patients – *Psychosocial Functioning Questionnaire (PFQ) for Patients with Low Back Pain*. This instrument has been thought as disease-specific and potentially useful for

the purposes of both clinical practice and research. We describe the development procedure of PFQ and the preliminary findings showing its psychometric properties. In particular, we would like to present the steps taken to construct the subscales of PFQ, intercorrelations between the subscales, findings concerning internal and test-retest reliability, and relationships of the PFQ scores with sociodemographic variables.

Material and methods

Subjects

100 consecutive patients were recruited into the study. All subjects were hospitalized in a neurology ward and had the diagnosis of LBP. Patients with other significant health problems were not included into the study. All patients participating in the study gave their informed consent before enrolment in the study. The data concerning gender, marital status, educational level and place of residence of the subjects are given in Table I. The values of means (M), standard deviations (SD) and ranges for age and duration of the disease are presented in Table II.

Methods

Psychosocial Functioning Questionnaire (PFQ) for Patients with Low Back Pain. The first stage in the development of PFQ consisted in generating items that would reflect those aspects of psychosocial functioning which are most vulnerable to decrements due to LBP and at the same time are highly weighed by patients themselves. Therefore, before wording the items for the initial version of the questionnaire, extensive interviews with patients were carried out to elicit information on the relevant psychosocial life domains affected by LBP. Additionally, literature review was done focusing on the problems in psychosocial functioning in LBP patients. On the basis of the information from these two sources, 74 items were generated which made up the initial version of the questionnaire. Patients were requested to rate their answers to the items on a 4-point scale with possible responses 'yes', 'rather yes', 'rather no' and 'no'. Most items were worded negatively (asking about negative impact of LBP), however, some items were worded positively (asking about optimal functioning) in order to avoid a response bias.

All patients were given the initial version of PFQ to complete. Out of this cohort, 30 random patients

Table I. Sociodemographic characteristics of the subjects (n=100)

Gender	Female	59%
	Male	41%
Marital status	Married	83%
	Single	6%
	Divorced	8%
	Widowed	3%
Education level	Low	12%
	Middle	79%
	High	9%
Residence	Urban	61%
	Rural	39%

Table II. Descriptive statistics for age and duration of the disease in the studied group (n=100)

	M	SD	Range
Age (years)	50.4	11.03	23-75
Duration of the disease (years)	9.6	8.65	0.1-40

Table III. The PFQ subscales and their descriptive statistics (n=100)

	PFQ subscale name	Number of items	M	SD
1.	Distress in interpersonal context	11	24.05	8.01
2.	Limitations in everyday functioning	8	19.83	6.05
3.	Acceptance of life with the disease	10	32.82	5.80
4.	Depressive complaints	11	32.45	7.17
5.	Sense of being disabled	7	14.72	5.28

Table IV. Intercorrelations (Pearson's r) between the PFQ subscales (n=100)

PFQ subscales	Distress in interpersonal context	Limitations in everyday functioning	Acceptance of life with the disease	Depressive complaints	Sense of being disabled
Distress in interpersonal context	1	0.57	-0.49	0.69	0.64
Limitations in everyday functioning		1	-0.36	0.50	0.62
Acceptance of life with the disease			1	-0.47	-0.47
Depressive complaints				1	0.51
Sense of being disabled					1

were tested again with PFQ after 72 hours to establish test-retest reliability.

Statistical procedures employed for data analysis included: factor analysis performed with the method of main components with oblique rotation (with Kaiser correction), correlation analysis (Pearson's r), reliability analysis (Cronbach's α) and independence tests (two-tailed independent t tests, Snedecor's F test in one-factor ANOVA). To test for homogeneity between the groups Levene's F test was used. Post-hoc Tuckey's test was used for homogenous groups and post-hoc Games-Hawell's test was used for non-homogenous groups. The statistical analyses were conducted with SPSS 12.0 PL for Windows.

Results

The PFQ subscales

Factor analysis was conducted on the scores from the initial version of the questionnaire to extract factors responsible for the variance in the test. The analysis yielded five factors, each of which accounted for more than 4% of the variance. The total variance explained by the extracted factors was 43%.

The five factors extracted through factor analysis served as the basis for the construction of the questionnaire subscales. However, only those items were chosen to build up the subscales which revealed highest factor loadings. Items with low loadings or with similar loadings in more than one factor were excluded from the final version of the questionnaire. These procedures left 47 items constituting five PFQ subscales which made up the final version of the questionnaire.

On the basis of the analysis of the contents of the items within each subscale, appropriate labels for the subscales were given. The names of the PFQ subscales and descriptive statistics are presented in Table III.

Intercorrelations

Intercorrelations (Pearson's r) between the subscales were computed in order to make sure the subscales were not redundant. The correlation matrix is presented in Table IV. All values of the coefficients are statistically significant at the level p<0.001.

Reliability

Reliability was assessed in two ways. Both internal consistency (Cronbach's α) and stability over time (test-retest reliability) were estimated. Internal consistency coefficients were calculated on the scores from all 100 patients, and test-retest reliability coefficients were computed on the scores from 30 patients. The obtained values of reliability coefficients are presented in Table V.

Relationships with sociodemographic variables

The relationships were analyzed between the PFQ scores and the following sociodemographic variables: gender, age, marital status, level of education, place of residence and duration of the disease. The scores of none the PFQ subscale showed statistically significant (p≤0.05) associations with gender, age, marital status, place of residence or duration of the disease. The only significant association was found between subscale 3 of PFQ (*Acceptance of life with the disease*) and level of education (Table VI). Subjects with higher level of education obtained significantly lower scores in this subscale than subjects with lower education levels.

Table V. Reliability coefficients for PFQ subscales

	PFQ subscales	Cronbach's α (n=100)	Test-retest (n=30)
1.	Distress in interpersonal context	0.89	0.89
2.	Limitations in everyday functioning	0.86	0.85
3.	Acceptance of life with the disease	0.88	0.85
4.	Depressive complaints	0.87	0.90
5.	Sense of being disabled	0.89	0.80

Discussion

LBP is a common and chronic disease which can severely affect the patients' social functioning in various life domains [13]. However, there is a disproportionate lack of standardized instruments to assess the degree to which the condition interferes with the patients' emotional well-being, social relationships and everyday-living functioning. We have undertaken the task of developing a questionnaire which could fill this gap.

Before constructing PFQ we had not made any specific assumptions as to which dimensions the questionnaire should explore. The contents of the items for the initial version of the questionnaire were decided on the basis of interviews with the patients and after the literature review focused on problems experienced by patients with LBP. This was to ensure that the life domains measured by the instrument are patient-generated rather than theoretically derived. We felt that this should equip the instrument with the potential for covering those life spheres that are relevant from the patient's point of view.

Factor analysis yielded five factors which we decided to accept as five basic dimensions measured by the questionnaire. However, in order to improve psychometric properties of the subscales we have deleted those items which showed low loadings in their own factors. Similarly, to make the subscales less inter-dependent, we have removed those items which showed similar loadings in more than one factor. After these procedures, out of 74 initial items, 47 items were included into the final version of the questionnaire.

We have analyzed the contents of the subscales and agreed on the appropriate labels for them.

Distress in interpersonal context is the subscale which measures the degree to which the disease interferes with the patients' interpersonal relationships. While analyzing the contents of this subscale we found that two kinds of items are interwoven in this subscale: those reflecting difficulties (disruptions) in interpersonal relationships and those reflecting certain negative emotions. We found it interesting that 'emotional' and 'interpersonal' items loaded on one factor, since in other similar questionnaires emotional and interpersonal spheres are usually treated separately and are measured by distinct subscales [14]. However, a closer look at the items with 'emotional' reference showed that they describe emotions, whose common feature is that they typically arise in social situations (e.g. shame, humiliation, embarrassment). These emotions could be labelled 'social emotions'. We hypothesize that these two kinds of items became combined within one factor since they reflect two interrelated facets of interpersonal functioning: behavioural and emotional. Patients who report experiencing such feelings as shame, humiliation etc. (emotional aspect), are also prone to limit their interpersonal contacts (behavioural aspect). It is probable that negative affect (distress) in social context is the core of difficulties exhibited in interpersonal relationships.

Limitations in everyday functioning measures the degree to which LBP interferes with activities of

Table VI. The PFQ scores in subgroups of subjects with various levels of education (n=100)

	PFQ subscales	High level education (n=9)		Middle level education (n=79)		Low level education (n=12)		ANOVA	
		M	SD	M	SD	M	SD	F	p
1.	Distress in interpersonal context	25.56	10.83	23.28	7.63	28.00	7.53	2.02	0.138
2.	Limitations in everyday functioning	21.56	6.27	19.22	6.11	22.58	4.91	2.05	0.134
3.	**Acceptance of life with the disease**	**27.11**	**9.32**	**33.15**	**5.23**	**34.92**	**3.55**	**5.79**	**0.004[a,b]**
4.	Depressive complaints	32.44	9.75	32.47	6.99	32.33	6.91	0.00	0.998
5.	Sense of being disabled	16.78	7.41	14.13	5.12	17.08	3.70	2.45	0.092

Post-hoc Tuckey's test:
a – statistically significant difference between high level and middle level education groups (p=0.007)
b – statistically significant difference between high level and low level education groups (p=0.005)

independent everyday living such as walking, housework duties, or hobby. This subscale most likely reflects the degree of functional disability due to physical limitations imposed by the disease.

Acceptance of life with the disease measures the degree to which the patient is determined to accept his life with the disease. It should be noted, however, that high scores in this subscale do not necessarily mean acceptance of the disease itself but rather reflect the tendency to perceive the disease as a challenge and to make efforts to maintain good spirits and happiness in spite of the limitations associated with the disease. We hypothesize that high scores in this subscale are indicative of good adaptation to the disease.

Depressive complaints measure the frequency of a wide range of psychological states that could be treated as a spectrum of depressive complaints: depressed mood, sadness, worrying, fatigue. The content of the items is probably too general to claim that the subscale measures symptoms of depression but we believe that high scores reflect the tendency to report complaints of a depressive type. Future research should make clear what association is between this subscale and clinical depression. The results of this subscale should be regarded as reflecting depressed mood and related negative affects and cognitions due to the disease rather than clinical depression.

Sense of being disabled is the subscale which measures the degree to which the patient perceives himself/herself as different from others because of the disease. This sense of social disability is due to self-conscience and conviction that others treat the patient as disabled and is strongly associated with self-depreciating feelings and cognitions.

The intercorrelations between the subscales range from 0.36 to 0.69 and show that the subscales are relatively interrelated but not redundant. Since the *Acceptance of life with the disease* subscale measures an adaptive aspect of social functioning we had expected it to show negative correlations with other subscales which measure maladaptive dimensions. The results we obtained show exactly this pattern of correlations. This could be treated as a preliminary result partially supporting internal validity of the questionnaire.

The highest correlation coefficient was found between the *Distress in social context* and *Depressive complaints* subscales. This result may indicate that depressive tendencies are closely associated with the degree of difficulties experienced in interpersonal relationships. On the other hand, it is also possible that persons with severer depressive complaints experience more difficulties in social contacts due depression rather than to LBP itself.

Internal consistency coefficients (Cronbach's α) were found to range from 0.86 to 0.89 and provide strong evidence for high reliability of all PFQ subscales. Correlation coefficients between two measurements with PFQ over 72 hours showed very similar values to internal consistency coefficients ranging from 0.80 to 0.90 and give support to high test-retest reliability (stability of the scores over time).

The scores of PFQ questionnaire were shown to be independent of sociodemographic variables such as gender, age, marital status, place of residence and duration of the disease. This indicates that the scores of PFQ indeed reflect differences in psychosocial functioning and are not confounded by other 'extrinsic' variables (e.g. gender, age, marital status). In a broader perspective, this finding may also suggest that psychosocial functioning in patients with LBP is predominantly affected by characteristics other than sociodemographic ones. This is in accordance with other research which suggests that psychosocial functioning of LBP patients is associated with personality factors and severity of the disease [15]. The only sociodemographic variable for which statistically significant differences were found in the PFQ scores was the educational level and these differences were limited to only one subscale – *Acceptance of life with the disease*. Patients with a higher level of education scored lower on this subscale than patients with middle and low education levels. However, this finding should be treated with caution due to significant disproportions in the number of persons in the compared subgroups which could result in a sample-related error. The relationship between the education level and this subscale needs further investigation.

Conclusions

This study shows that PFQ can be treated as a new reliable instrument to measure various aspects of psychosocial functioning in patients with LBP. The results of this study revealed five social functioning domains that are relevant to LBP patients. The subscales which measure these domains were shown to be interrelated but not redundant. Reliability coefficients demonstrated high internal reliability of these subscales and stability of the scores over time. The scores of the questionnaire were found to be mostly independent of the confounding influence of sociodemographic variables.

Further studies are needed, however, to assess validity of PFQ and its associations with other variables, especially with clinically assessed severity of LBP symptoms and with psychological factors such as personality or coping strategies. Overall, we hope, the availability of this new instrument can stimulate further research into psychological aspects of LBP.

A copy of the questionnaire with all other necessary materials can be obtained by direct request from the corresponding author, e-mail: janowski@kul.lublin.pl

Konrad Janowski, Joanna Kuryłowicz, Stanisława Steuden

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