

## The measurements of health-related quality-of-life and pain assessment in the preoperative patients with low back pain

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**Key words:** lumbar disc herniation disease; health-related quality of life, preoperative SF-36 scores; Lithuanian analogue of the McGill Pain Questionnaire; Oswestry Disability Index.

**Summary.** *Objective.* This prospective observational study of the Short-Form Health Survey (SF-36), Oswestry Disability Index, Lithuanian version of the McGill Pain Questionnaire, and Visual Analogue Scale (VAS) for pain was performed to evaluate their effectiveness in the additional preoperative screening of patients with disc herniation disease.

*Patients and methods.* In the present study, we investigated a cohort of 100 patients with lumbar disc herniation causing low back pain and the second one of 100 patients with nonspecific low back pain by applying physical activity, pain scales and Short-Form 36 General Health Questionnaire.

*Results.* The quantitative analysis of SF-36 domain scores showed the substantial differences in both examined (herniated and control) groups. In the present study, we estimated moderate but statistically significant ( $P < 0.05$ ) correlations between the bodily pain domain scores and assessment of back and leg pain on the VAS, as well as between the physical function and walking/standing ability (Oswestry). According to appropriate pain assessment instruments (Lithuanian version of the McGill Pain Questionnaire), qualitative and quantitative analysis of the preoperative patients was performed.

*Conclusion.* The provided methodology could be used in population-based studies or in clinical samples that focus on specific impairments and seek to control the pain frequency and intensity, for example, follow-up assessments testing the effectiveness of surgical procedures performed, and to elicit the pathways leading to other impairments.

### Introduction

For complete assessment of the benefits of a surgical intervention, it is essential to provide evidence of the impact on the patient in terms of health status and health-related quality of life (1). These terms refer to experiences of illness such as pain, fatigue, and broader aspects of the individual's physical, emotional, and social well-being. Unlike conventional medical indicators, these broader impacts of illness and treatment need to be assessed and reported by the patient (2, 3). The measurement of quality of life provides objective evaluations of how and how much the disease influences patients' life and how patients cope with it. These evaluations may be used as a baseline of outcome measures and should provide framework to determine the impact of any change on patients' quality of life (4).

According to the recent publications, there is an increasing interest in the use of health-related quality-of-life measures in assessing outcomes of spinal

surgery, because it might allow comparisons across studies using the standard questionnaires (5–8). One of the most frequently applied questionnaires for this purpose in spinal pathology is 36-item Short-Form General Health Questionnaire (SF-36) (9). The advantage of this questionnaire is that SF-36 achieves the best balance between length, reliability, validity, responsiveness, and experience even in large populations of patients that complain of low back pain (8, 10). The SF-36 questionnaire is a multi-purpose, short-form health survey with 36 questions. It yields an 8-scale graph of functional health and well-being scores. They represent physical function, role physical, bodily pain, general health, vitality, social function, role emotional, and mental health. Two of the most interesting features of SF-36 are that it has been validated in many different languages and countries and that normative data are available.

It is evident that each pain has unique qualities categorized under a single linguistic label and differs

not only in intensity. The measurements of pain are essential for the evaluation of methods to control it. Unfortunately, laboratory tools have obvious ethical and technical limitations on the intensity and duration of pain, as the laboratory pains are necessarily brief and might be stopped when reach unbearable intensity (11). In contrast, clinical pains are often persistent, beyond the patients' control, and accompanied by high levels of anxiety. Moreover, studies on them are clearly desirable, and severe limitations are imposed by measuring techniques of clinical pain, where Melzack and Torgerson have made a start toward the specification of the pain qualities by developing specific instrument, the McGill Pain Questionnaire (12). The Lithuanian analogue of McGill Pain Questionnaire was translated and developed by the member of the International Association for the Study of Pain, A. Pakula, in 1986, and it is successfully employed for clinical pain evaluation in pain clinics of Lithuania.

Generic measurements are broadly applicable and can therefore be employed across patient populations because they could be cheaply and easy used as the additional screening methods. However, SF-36 is recommended for assessing general health status, and more spine-specific measures are additionally recommended for assessment of low back pain (13). This prospective observational study using the SF-36, Oswestry disability, Lithuanian analogue of the McGill Pain Questionnaire, and Visual Analogue Scale (VAS) for pain measurement was performed in order to evaluate their effectiveness in the preoperative screening of patients with disc herniation disease in comparison with data of the control group subjects.

### Patients and methods

Within this randomized controlled clinical trial, there were reviewed the populations of the patients with low back pain at the Clinic of Neurosurgery, Hospital of Kaunas University of Medicine. Only one spinal surgeon with adequate training and expertise in performing microdiscectomies participated, and the examination of randomized study sample was taken between June 2005 and December 2006 under permission of our local ethics committee (No. BE-2-31), which had been valid between June 2003 and June 2006. One hundred patients with disc herniation disease were recruited for the present study based on the following criteria: 1) chronic pain occurring daily for at least three months and at least 20 hours per day; 2) chief complaint of pain and/or numbness in the lumbar spine, buttock, and/or lower extremity; 3) age greater than 21 years and less than 76 years;

4) duration of current episode <16 days (judged from the patient's self-report); 5) symptoms extending distally to the knee (judged from the pain diagram); 6) stiffness in the lumbar spine (judged from segmental mobility testing); 7) signs consistent with nerve root compression, including any one of the following: a) reproduction of low back pain or leg pain with straight leg raise less than 45°; b) muscle weakness involving a major muscle group of the lower extremity; c) diminished lower extremity muscle stretch reflex (quadriceps and Achilles tendon); d) diminished or absent sensation to pinprick in any dermatome of the lower extremity; 8) magnetic resonance imaging or computed tomography demonstrating anatomical intervertebral disc disease correlating with the patient's symptoms. The next 100 patients, majority of which belonged to nursing personnel at the Hospital of Kaunas University of Medicine, experiencing milder low back pain symptoms, were involved into the present study according to the following criteria: 1) chronic pain occurring after physical chores for at least three months; 2) chief complaint of pain and/or numbness in the lumbar spine; 3) age greater than 20 years and less than 65 years; 4) no symptoms extending distally to the knee (judged from the pain diagram); 5) reproduction of low back pain or leg pain with straight leg raise more than 45°. According to the one-way ANOVA test, both groups concerning patients' age and sex were proved to be homogenous. The patients were ineligible if they had the following: prior lumbar surgery, segmental instability, vertebral fractures, spine infections, other types of degenerative disc disease, tumors, and pregnancy.

*Assessment methods.* Subjects were asked to complete a screening questionnaire that combined demographic characteristics with information about previous and present history and current medication. Physical examinations of the preoperative patients included motor, sensation, reflexes, degree of pain-onset by the straight leg raising test (Lasègue symptom), and computed tomography imaging. Strength of motor was determined using a manual muscle test, and results were classified as normal, good, fair, poor, trace, and zero. Sensation was judged according to whether or not there were some hypoesthetic or hypoalgesic changes.

*Specific outcome tools.* The SF-36 general health questionnaire, including 36 items summarized in two measures related to physical and mental health, was used for evaluation of health-related quality of life. Each scale ranges from 0 (worst health state) to 100 (best health state). *Pain measure.* The primary mea-

sure of pain for this pain-mood study was the “bodily pain” intensity item in the SF-36 quality-of-life instrument. Patients responded to the question, “How severe bodily pain did you have during the past 4 weeks?” by choosing from “very severe,” “severe,” “moderate,” “mild,” “very mild,” and “none.”

**Depression and anxiety measures.** The mood measure was the mental health subscale of the SF-36 health survey. This subscale includes three Likert scale items about the frequency of depressed vs. happy moods in the previous month and two items about the frequency of anxious vs. peaceful moods, each with 6 possible responses ranging from “all of the time” to “none of the time.” Because depressive and anxious moods usually coexist in medically ill patients, the developers of the scale combined the items into a single score, which correlates closely with psychiatric diagnoses.

**Visual Analogue Scale (VAS)** with 10 levels was used to evaluate the pain intensity 24 hours before surgical treatment. Patients were asked to indicate their pain on a scale of 0 (the lowest pain intensity) to 10 (the highest pain intensity).

**VAS pain in the leg.** This parameter was used to measure the intensity of experienced pain in the leg at the moment of administration of the questionnaire.

**VAS pain in the back.** This parameter measured the intensity of the pain in the back experienced at the moment of administration of the questionnaire. This parameter is included because many patients with disc herniation also have back pain of varying intensities, which could be changed after surgery.

**The Oswestry Disability Questionnaire** consists of items addressing different aspects of daily living skills; each of them is scored from 0 to 5, with higher values representing greater disability. The total score is multiplied by two and expressed as a percentage, defined as ODI (Oswestry Disability Index). The Lithuanian version of the Oswestry Disability Questionnaire was completed by the patient immediately before surgical treatment to evaluate the influence of disability level upon motor function. The shuttle walking test was performed to evaluate the progressive, maximal walking speed and endurance as it was previously described by Taylor (2001) and Pratt (2002). The standing and walking ability was rated on a 5-point scale: from 0 (the examined function was minimally affected) to 5 (the examined function was maximally affected).

Disability levels revised by Fairbank (1980) and Hudson-Cook (1988) were interpreted in that way: 0–10 scores (ODI, 0–20% of minimal disability) mean

that patients can cope with most activities of daily living. No treatment may be indicated except for suggestions on lifting, posture, physical fitness, and diet. Patients with sedentary occupations (for example secretaries) may experience more problems than others. Moderate disability, 11–20 scores (ODI, 20–40%), denotes experience of more pain and problems with sitting, lifting, and standing. Travel and social life should be more difficult. Patients might be off work and personal care, as well as sleeping and sexual activity might not be grossly affected. In these cases, conservative treatment may be sufficient. Severe disability, 21–30 scores (ODI, 40–60%), expresses pain being a primary problem for these patients, but they may also be experiencing significant problems in travel, personal care, social life, sexual activity, and sleep. A detailed evaluation is appropriate. A score of 31–40 implies patients being crippled (ODI, 60–80%) and suggests that low back pain has an impact on all aspects of daily living and work. Active treatment is certainly required. A score of 41–50 suggests extremely high level of disability (ODI, 80–100%). These patients may be bed bound or exaggerating their symptoms. Careful evaluation is recommended.

According to the McGill Pain Questionnaire, we determined the properties of the pain experience. The participants completed four components of this questionnaire. In the first part, they were asked to describe the area(s) of the body in which pain occurred (back, lower limbs only, or miscellaneous) and indicated whether each of 54 pain words described their chronic pain component, which could: 1) encompass more than one area of the body, as well as more than one pain descriptor; 2) be incidental to each area of the body; 3) be experienced in all areas at the same or not the same time, but under the same circumstances; 4) be defined by the presence (continuous or intermittent) for at least 3 months.

Based on the data from the second part, being the core component of the McGill Pain Questionnaire, the words were categorized into 2 major classes and 14 subscales. The classes were the following: words that describe the *sensory qualities* (comprising 8 subscales) of the experience in terms of temporal, spatial, pressure, thermal, and other properties; and the second – words that describe *affective qualities* (comprising 6 subscales) in terms of tension, fear, and autonomic properties, being part of the pain experience. Additionally, each word from these categories had a rank value indicative of the relative intensity of pain, with the scores ranging from 0 to 54; therefore, three types of data suitable for each category (sensory, affective)

or even overall score could be obtained: 1) the number of words chosen (NWC); 2) pain rating index based on the patients' mean scale values – designated henceforth as the PRI (S); and 3) pain rating index based on the rank values of the words – PRI (R).

In the third part, we have measured the pain change over time, as well as the parameters inducing relieve or increase of pain.

Finally, from the last – fourth part – the assessed number-word combination was chosen as the (additionally to the VAS) indicator of overall pain intensity at the time of administration of this questionnaire.

**Method of administration.** Preliminary studies have shown that data obtained by allowing patients to fill out the questionnaire by themselves are sometimes unreliable, as they may fail to read the instructions carefully and miss three features: 1) they may choose more than one item from a list; 2) may feel compelled to choose a word from every subclass; and 3) may fail to describe the pain at the moment the questionnaire is administered and use descriptors reflecting the sustained pain they had hours earlier (11). Therefore, in our study, the instructions and pain descriptors were read out loud to the participants by a research assistant, to make sure they were fully understood, as some of pain words may be beyond the patients' vocabulary and should be defined; for that purpose, the pain words have been re-read several times until the subject reached a decision.

### **Statistical methods**

Data were expressed as means  $\pm$  standard error. The statistical significance of the difference between the means was performed with Student's independent test, and due to assumption of abnormal distribution of variables, nonparametric tests were applied (Mann-Whitney). The statistical analysis was performed using SPSS version 10.0. Significance was accepted at  $P < 0.05$ .

### **Results**

At the present study, patients with the disc herniation disease and the control group were examined. Study population ( $n=200$ ) consisted of patients with disc herniation disease ( $n=100$ ) and 100 patients in the control group. The mean age of patients with disc herniation disease was  $43 \pm 1$  years and ranged from 21 to 76 years, whereas the mean age of control group patients was  $41 \pm 1$  years and ranged from 20 to 65 years. In our study, we have clinically investigated patients with medial and lateral  $L_2-L_3$ ,  $L_3-L_4$ ,  $L_4-L_5$ , and  $L_5-S_1$  disc herniation, where the two latter composed

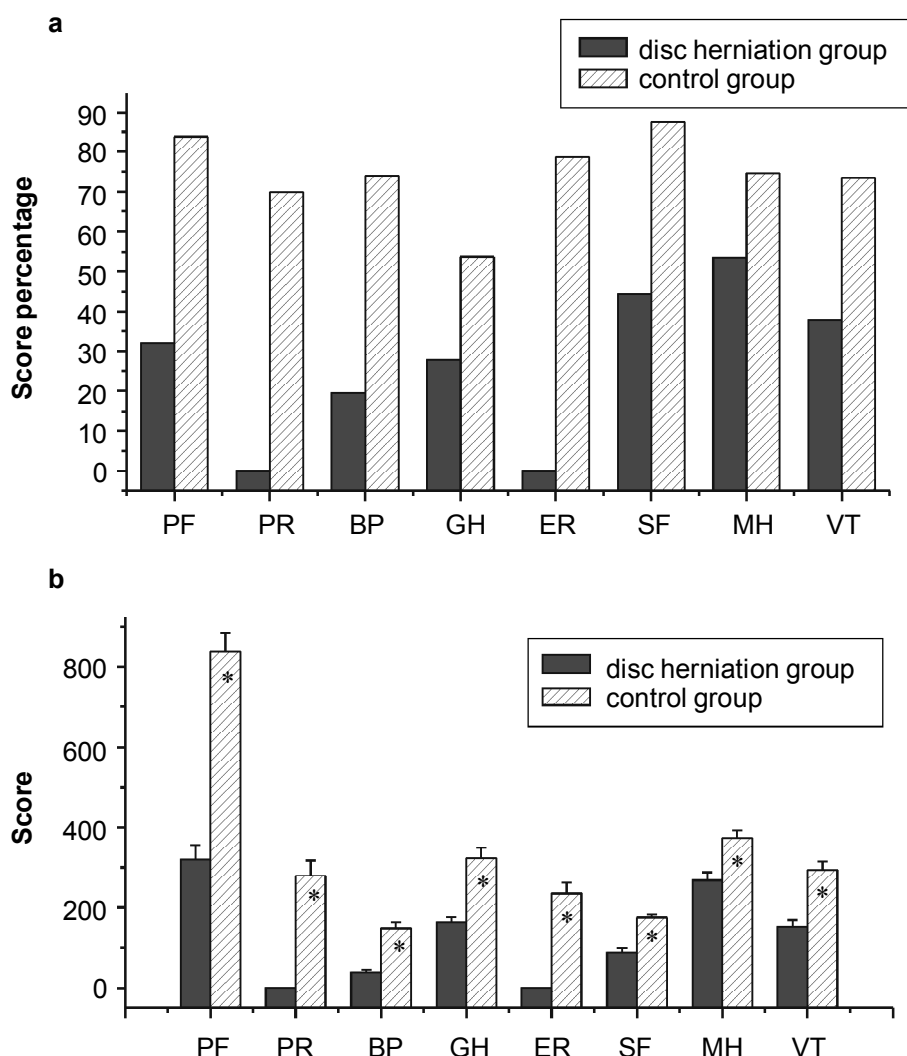
71.2% of all cases, and in the control group it made up 100%. Examination of patients with disc herniation disease showed the different pain duration in leg and low back –  $7 \pm 1$  years and  $7 \pm 1$  months, respectively.

The objective examination of the patients with disc herniation disease showed the weak lower extremity muscle function; for example, the moderate muscle dysfunction (movement possible against gravity, but not against resistance by examiner) was typical for greatest part of patients that ranged from 75% to 83%. Such functions as sensory and reflex function were also reduced. The positive Lasègue symptom was estimated in all examined patients, but it never reached  $90^\circ$ .

The quantitative analysis of SF-36 domain scores showed the substantial differences in both examined (herniated and control) groups (Fig. 1). According to the data presented in Fig. 1a, the score percentage of the physical function, physical role, bodily pain, general health, social function domains decreased in two–three folds in the group with disc herniation. The score percentage in the rest two domains, i.e. the mental health and vitality, did not decrease significantly (Fig. 1a). Mean SF-36 scores and standard errors were estimated in both groups, with the disc herniation disease and in the control (Fig. 1b). According to the data in Fig. 1b, scores of for all domains were considerably lower in the disc herniation disease group than in the control group, and the differences were statistically significant ( $P < 0.01$ ). However, for social function and the mental health domains, the differences between groups were not so pronounced, though statistically significant ( $P < 0.01$ ) (Fig. 1b).

SF-36 scores of some domains were tested regarding to the correlation between the bodily pain and VAS scores, also between the physical function and standing/walking ability (Oswestry) scores (Fig. 2). According to the data shown in Fig. 2, there were indirect statistically significant ( $P < 0.05$ ) correlations between the bodily pain and VAS scores in the back ( $R = -0.3$ ) and leg ( $R = -0.8$ ) (Fig. 2a, b). The physical function was related to standing/walking ability (Oswestry); correlation coefficients were  $-0.6$  and  $-0.7$ , respectively ( $P < 0.01$ ) (Fig. 2c, d).

According to the Oswestry Disability Questionnaire, 16% of patients were bed bound, 37% – crippled; severe disability was assessed in 30% and 20% of patients in the case and control groups, respectively. ODI of 11% and only 6% for moderate and minimal disability was reported by the preoperative patients, while the percentage of the same value of the control group subjects was 38% and 42%, respectively.



**Fig. 1. Diagram showing score percentages and scores of the SF-36 domains in both the disc herniation and control groups**

Score percentages of herniated and control groups are shown in each domain (a), and score values of each domain are presented as mean plus/minus standard error (b).

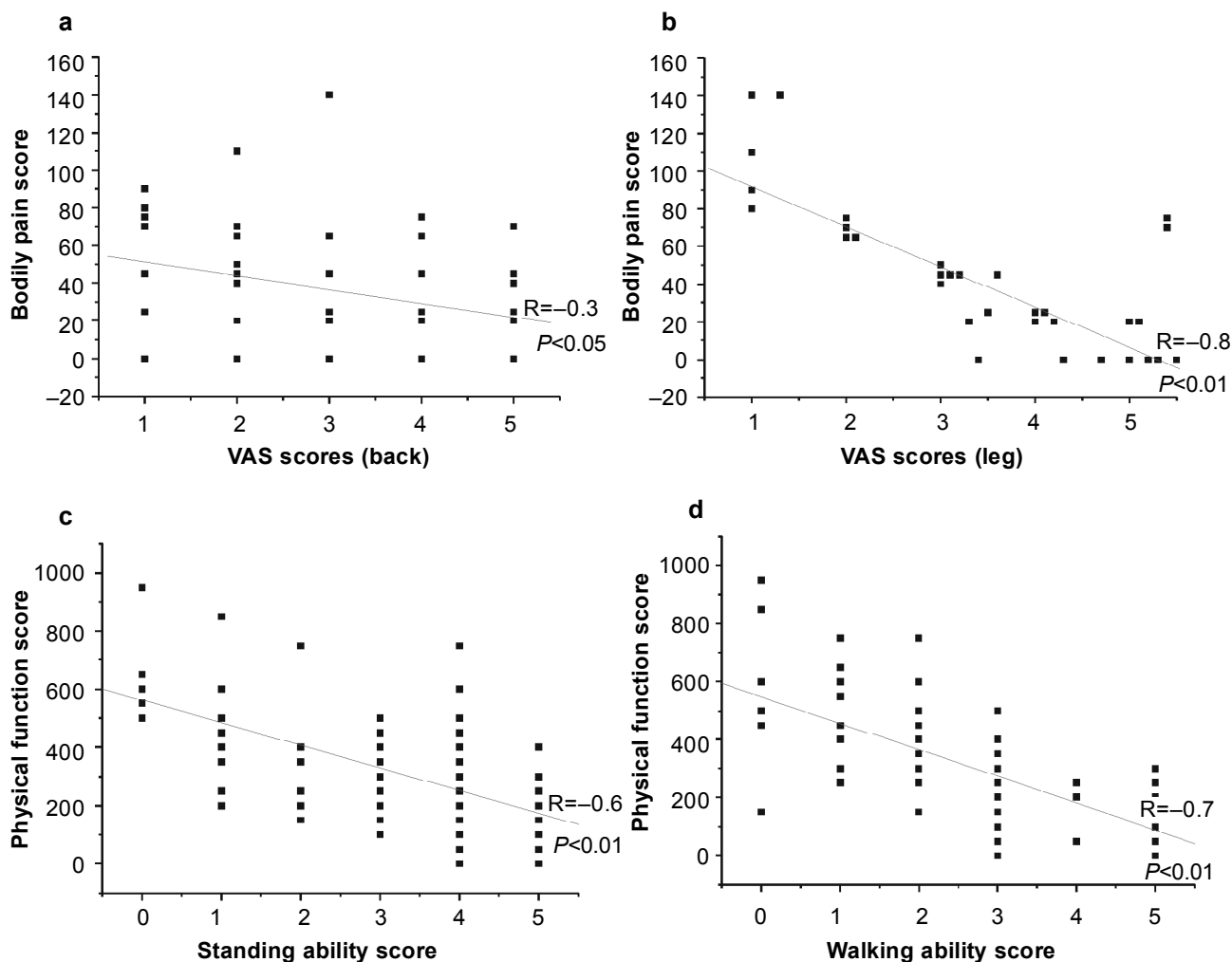
\*Note the statistically significant differences between the both groups ( $P < 0.01$ ).

PF – physical function; PR – physical role; BP – bodily pain; GH – general health; ER – emotional role; SF – social function; MH – mental health; VT – vitality.

According to the Lithuanian analogue of McGill Pain Questionnaire, all analyses were performed on the preoperative patients to assess the low back pain and sciatica (the latter was defined as the presence of constant or intermittent pain in one or both legs, radiating below the knee, collectively with signs of nerve-root irritation – a positive straight-leg test, defined as reproduction of radicular pain by elevation of the leg; or nerve-root compression with motor, sensory, or reflex deficits; or both, which had to be present, along with computed tomography evidence of a herniated nucleus pulposus at the level corresponding to the symptoms and clinical findings) *qualitative* criteria. In the first part of the questionnaire, sub-

jects marked the location of their current pain, and the overwhelming majority of the participants, 100%, indicated pain spreading to the leg due to sciatica criteria mentioned above, whereas 87% noted localized pain in the back. Commonly, all of the preoperative patients' subgroup described their primary pain in the low back.

From the second part of the questionnaire, guiding Melzack's criterion of 30%, indicating a representative word for the preoperative patient subgroup, where only 7 of 54 words from the sensory and 16 of 54 words from the affective category met the criterion in the leg, whereas 2 of 54 words from the sensory category matched the criterion in the low back (Table).



**Fig. 2.** Scatter plots and the correlation curves illustrating the statistically significant relations ( $P<0.05$ ) between the bodily pain (SF-36) and VAS scores in the back (a) and VAS scores in the leg (b), also between the physical function (SF-36) and standing ability (Oswestry) (c) and walking ability (Oswestry) scores (d). All correlation curves show the indirect relation in all variable pairs,  $R$  (correlation coefficient) ranged from  $-0.3$  to  $-0.8$ . Note stronger relations between the bodily pain (SF-36) and VAS scores in leg (b), the physical function (SF-36) and standing, walking abilities (Oswestry) scores (c, d).

On the pretreatment assessment, the NWC was determined for both pain descriptor classes, which was organized in this way – 607 pain words from sensory and 863 from affective class in the leg, whereas in the low back, there were rated 264 pain words for sensory and 222 for affective class.

In addition to the analyses, conducted in the second part of the questionnaire, PRI (R) and PRI (S) were ascertained along with correlations between PRI (R) sensory, affective and overall categories (Fig. 3a), where PRI (R) values in the leg made up in this manner 1425 from sensory, 2159 from affective, and 3584 from overall categories; and PRI (R) values in the low back came to 548 score values from sensory, 430 from affective and 978 from overall categories.

Thereby, PRI (S) estimation based on the mean rank values was carried out rather similarly to the latter ones and this amounted  $44.53\pm 8.54$  for sensory,  $102.8\pm 16.47$  for affective and  $67.62\pm 9.12$  for overall categories of pain descriptors in the lower limbs, and finally PRI (S) in the low back embodied  $18.9\pm 5.51$  for sensory,  $21.5\pm 2.8$  for affective and  $19.96\pm 3.43$  for overall categories (Fig. 3b). Correlation analysis among PRI (R) sensory, affective, and overall values showed no statistically significant correlation.

From the third part of the questionnaire, 20.5% of patients described their pain as constant and intermittent but strengthening in the morning, 18.8% outlined intermittent and intensifying pain in the evening, 16.1% of subjects termed intermittent pain, strengthe-

**Table. Analysis of the number of words chosen according to Melzack's criterion of 30% in the preoperative study sample**

| Pain words in the leg (sensory class) | Frequency (%) | Pain words in the low back (sensory class) | Frequency (%) |
|---------------------------------------|---------------|--|---------------|
| Sharp                                 | 72            | Gnawing                                    | 48            |
| Cramping                              | 55            | Dull                                       | 48            |
| Tight                                 | 42            |  |               |
| Tugging                               | 40            |  |               |
| Pricking                              | 38            |  |               |
| Lacerating                            | 34            |  |               |
| Stabbing                              | 30            |  |               |
| Pain words in the leg (sensory class) | Frequency (%) | Pain words in the leg (sensory class)      | Frequency (%) |
| Tiring                                | 81            | Annoying                                   | 62            |
| Boring                                | 76            | Preventing from sleep                      | 58            |
| Nagging                               | 76            | Angering                                   | 51            |
| Miserable                             | 74            | Anxious                                    | 50            |
| Dreadful                              | 67            | Maddening                                  | 46            |
| Sickening                             | 66            | Fearful                                    | 41            |
| Suffocating                           | 64            | Unbearable                                 | 36            |
| Troublesome                           | 63            | Distractable                               | 30            |

ned in the daytime, whereas apparently lower percentage of patients depicted increasing pain all the day long and intensifying pain at night, which accounted for 11.6% and 10.7%, respectively, and for just 1.8% of the patients, it deemed decreasing. Along with those descriptions, the patients identified the following factors as pain relieving: pain killers and nonsteroidal anti-inflammatory drugs (NSAIDs) (65.3%), muscle relaxants (15.3%), mild and strong opioids (10.45%), and tranquillizers and antidepressive drugs (8.94%). In contrast, 93.3% reported positional and motional factors increasing their pain; however, 7.7% noted other causes such as unknown ones, warmth, chill, and even simple touch.

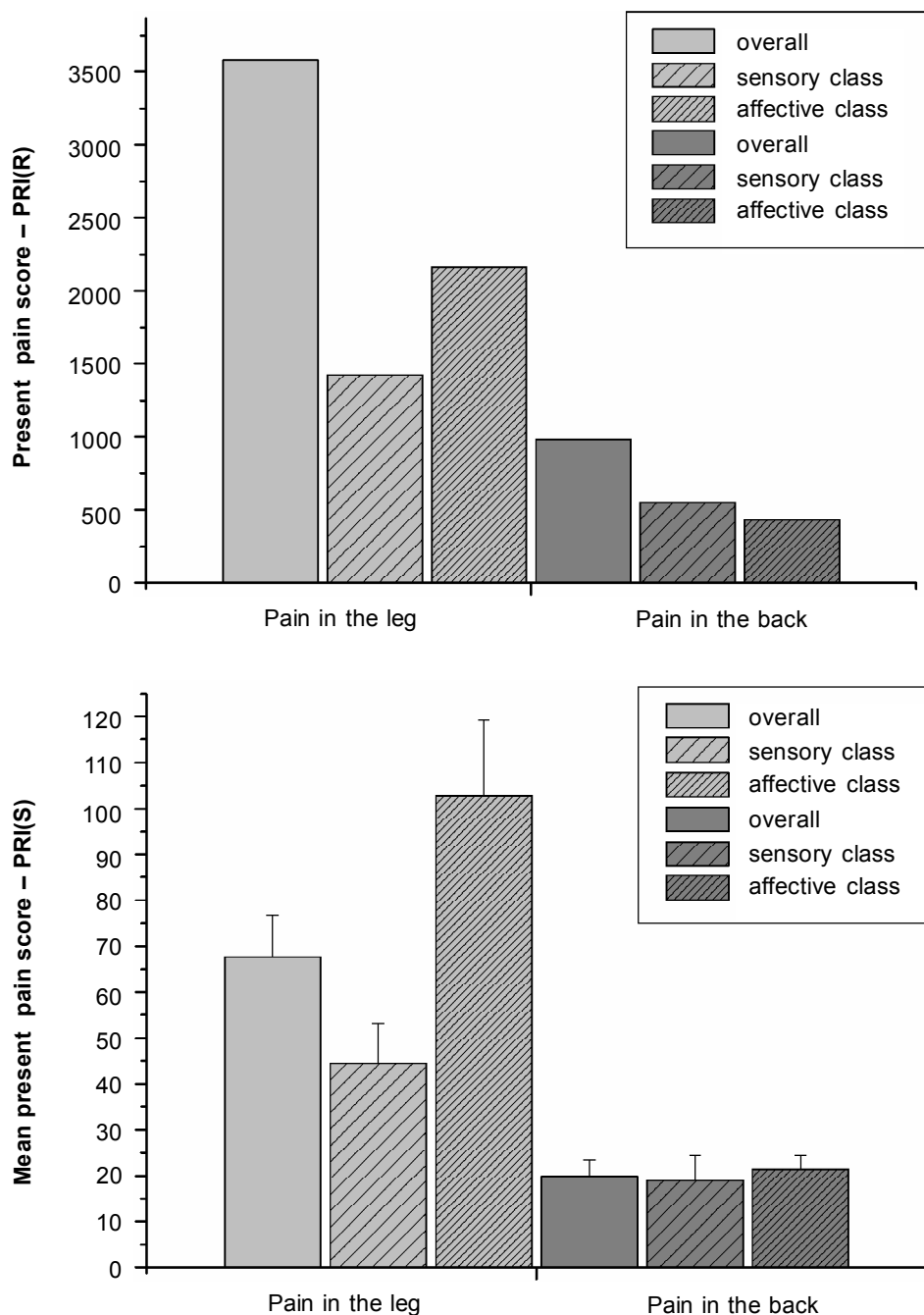
Finally, compared to VAS, PPI value was applied based on a 1–5-point pain intensity scale, and moderate statistically significant correlations were obtained ( $R$  ranged from 0.4 to 0.42) between both values in the back and leg itself. The mean VAS values of the control group patients were  $3.3 \pm 1$  in the leg and  $2.5 \pm 1$  in low the back, while the same values for the lumbar disc herniation disease patients were  $8.47 \pm 1$  and  $5.7 \pm 1$  scores, respectively.

### Discussion

The present observational study was performed on the preoperative patients with disc herniation disease, along with the physical examination and computed

tomography imaging, providing a generic health-related quality-of-life instrument – the SF-36 – and more spine-specific measurements, i.e. Oswestry Disability Questionnaire, Visual Analogue Scale (VAS) and Lithuanian analogue of the McGill Pain Questionnaire, regarding to determination of the self-reported quality of life, physical disability, pain intensity (VAS) and disease-specific pain qualitative parameter criteria (5, 6, 9, 14–19, 20). The present data associated with the SF-36 questionnaire indicate substantially lower general health, mental health, physical function, physical role, social function, and vitality scores in patients with disc herniation disease as compared to the control group. Furthermore, the preoperative patients reported significantly lower Oswestry Disability Questionnaire scores and higher pain intensity according to both the McGill Pain (PPI) and VAS. In the present study, we have chosen the Lithuanian analogue of the McGill Pain Questionnaire, VAS scale, SF-36, and Oswestry Disability Questionnaire that are validated tools for disability and quality-of-life measurements in patients with low back pain caused by disc herniation disease and are used more frequently than other questionnaires or scales (22).

The SF-36 contains such domains as physical function, physical role, bodily pain, general health measuring physical state, likewise vitality, emotional role, mental health reflecting the psychological status of



**Fig. 3. Diagram, showing qualitative criteria of the lumbar disc herniation disease patients for the back and leg pain**

PRI(R) – pain rating index based on the added rank values of the words for each sensory, affective, and overall categories; PRI(S) – pain rating index based on the mean rank values of the words for each sensory, affective, and overall categories.

the patients, and social function representing socioeconomic status of the subjects.

*Quality of life and somatosensory SF-36 domains.* The physical function, the physical role, and the bodily pain are the domains that reflect the physical sphere of quality of life. According to our study, significantly lower mean scores in all physical SF-36 do-

main for low back pain sufferers were estimated, and these findings coincide with data of the neurological examination of the patients. Decreased scores in the physical function and the physical role domains should be explained by motor dysfunction of the lower extremity, reducing of the reflex function. The bodily pain scores may be reduced due to the mechanical



compression of sensory radices of spinal nerves by herniated disc. *Quality of life and psychological SF-36 domains*. The present investigation revealed relationships between both psychological domains – emotional role and mental health – likewise sensory domain – bodily pain. According to our data, a quite weak correlation between the mental health and the bodily pain was observed that might be explained by many others substantial factors, influencing the mental health of participants, for example, socioeconomic status. The persistent pain was primarily predicted by a combination of somatic (degree of disc displacement), psychological (depression and the pain coping strategies avoidance behavior, endurance strategies, non-verbal pain behavior, and search for social support), and social parameters (social status and sitting position) with a correct prediction in 86% of cases (23).

According to the recent reports, depression and anxiety were related to bodily pain and general health, and these results coincide with our findings (24). However, neither depression nor anxiety play a very important role in the pathogenesis of disc herniation disease, on the contrary, as previously reported by Coelho and co-authors (2005), who investigated health-related quality of life of patients with congestive heart failure (25). The physical function, the physical role, the bodily pain, the emotional role, and the mental health in turn influenced status of general health that is well reflected by the general health SF-36 domain. According to the present investigation, the general health scores were related to the bodily pain ones, but this relationship was not very strong, because general health status of patients could be also related to other concomitant pathology, whereas both the vitality and the general health SF-36 domains are determined mostly by psychological factors (25–27).

According to the recent reports, the SF-36 is widely applied for evaluation of health-related quality of life of patients with different diseases and health states (25, 26, 28–30). Also the SF-36 was administered to patients with degenerative lumbar spinal disorders, chronic low back pain suffers (8, 13, 31–33). The data of our study approximately coincide with findings by Zanolli and co-authors (8), because authors have reported also quite low values of correlation coefficients between SF-36 domains. Furthermore, score values of most domains in our study were similar to Zanolli and co-authors ones (8). For example, in the present investigation, the score values of such domains as the physical function, the bodily pain, the vitality, and the mental health completely coincide with scores reported by Zanolli and co-authors for patients with

disc herniation disease. Whereas, we determined lower scores than Zanolli and co-authors in the physical role, the general health, the social function, and the emotional role domains (8). These discrepancies may exist due to the socioeconomic differences that take place between Lithuanian and Swedish populations. According to the recent reports, perceptions of living conditions and quality of life must be interpreted in the light of cultural differences among single European countries (28). Generic measurements such as SF-36 are broadly applicable and can therefore be used across patient populations; however, the SF-36 is recommended for assessment of general health status, and more spine-specific measures are additionally recommended for assessment of low back pain.

The low values of correlation coefficients between SF-36 domains and other preoperative variables may be surprising. Especially due to pain evaluation, we would like to expect a little stronger correlation between the bodily pain domain scores and assessment of back and leg pain on the VAS, as well as between the physical function and walking/standing ability. According to performed correlation analysis, there was a statistically significant but moderate correlation between the bodily pain and VAS assessment for leg and back pain intensity, as well as between the physical function and walking/standing ability, and present data coincide with Zanolli et al. (2001) findings (5). Discrepancies between different types of pain outcomes may exist due to the problems of the patient self-reports because people may recalibrate their self-assessments based on recent health problems (21).

Based on the results from Oswestry Disability Questionnaire, microdiscectomy was highly indicated for 83% of the preoperative patients, and for 67% of the percentage given above, surgical procedure could relatively enhance physical activities of daily living, whereas for 16% of the bed-bound patients, it remained controversial. On the other hand, 11% and 6% of patients with moderate and mild disabilities due to interpretations of Fairbank (1980) and Hudson-Cook (1988) (38) were not indicated for operation; however, despite these statements they were screened for it, as other indicating factors showed the necessity of intervention, likewise seemed controversial 20% of the control group patients of severe disability, what might suggest the need to use combined instruments along with clinical examination techniques for assessing pain and health-related quality of life. Moreover, this could be explained by the magnitude of aged patients involved in our study, and less comorbidity or age-re-

lated changes were not possible to avoid, as both groups were homogenous according to age and sex.

According to Daltroy et al. (1999), self-reports of greater disability were predicted by current joint pain or stiffness, use of prescription medications, residence in urban areas, depression, female gender, aging, lack of memory problems, arthritis, and lack of exercise. However, those report assessments are broadly used to evaluate self-reported physical ability, self-evaluated pain quantitative (intensity), disease-specific qualitative and health-related quality of life (5, 6, 9, 14–19).

Loss of pain intensity may be explained by the age-related changes of central and peripheral nervous systems too (34, 35). According to the recent reports, aging deeply influences several morphologic and functional features of the peripheral nervous system (34). Verdu et al. (2000) reported a loss of myelinated and unmyelinated nerve fibers in elderly subjects and several abnormalities involving myelinated fibers such as demyelination, remyelination, and myelin balloon figures. Aging also affects functional and electrophysiologic properties of the peripheral nervous system, including a decline in nerve conduction velocity, sensory discrimination (34). As previously reported by Toda et al. (2000), intensive low back pain was assessed in aged patients without a positive result of straight leg raise test (36). According to authors, in the loss of muscle mass trunk and lower extremity and central obesity may be risk factors for chronic low back pain in women aged from 45 to 69 years. On the other hand, the low back pain intensity was significantly associated with other pain and comorbidities (37). According to the authors, the low back pain intensity was not significantly associated with the Established Populations for Epidemiologic Studies in the Elderly performance score after adjusting for age, body mass index, knee pain, hip pain, and other comorbidities. Authors of the present study examined about 70% of all patients ranging from 23 to 50 years; however, aging patients with other pain and comorbidities comprised only 30%.

Due to the subjective character of pain, it deemed not possible, in the clinic situation, to expound on the original pain sensation combining both quality and intensity as patients frequently lack of accuracy describing pain. On the other hand, precise, measurable information is needed to design suitable treatment, taking into account sensory, affective, evaluative, psychological, and cultural pain components.

In this study, the McGill Pain Questionnaire proved to be a useful instrument for assessing patients' pain quality and intensity, which has been used in

diverse clinical situations. Wagstaff et al. (39), Dubuisson & Melzack (40), and Pimenta & Texeira (41) have all used the McGill Pain Questionnaire to evaluate pain in chronic patients, suggesting that each pathology presents unique qualities of the pain experience, which could be translated by groups of specific words chosen by the patient, and it was found to be particularly true in the case of lumbar disc herniation disease (Table).

Regarding to analyzed data in this study, pain in the leg and the low back differs in qualitative and quantitative parameter criterions (Table, Fig. 3), and it might be explained by the pain tendency in the leg to overlap the low back pain intensity. The overwhelming majority of pain descriptors in the leg belonged to the affective class, what could indicate that besides physical ailments, their pathology included psycho-emotional component too, whereas marginal prevalence of sensory class compared to affective is seen.

According to Robinson and Riley (42), there is a relationship between somatic illness and sensory, affective, evaluative pain, the strongest relationship being with affective one. Affective pain itself is influenced by emotions and physical sufferings (43, 44); it is therefore likely that patients with additional chronic or intermittent diseases advert to the mean age and range of our sample population, this seemed unavoidable, would report more affective words than those, who do not. It should be emphasized that these propositions considered being also the guiding points of, why the control group subjects were not involved in the pain study.

Previous studies on the low back pain revealed that demographic and disease-specific variables in turn are under the influence of general health status, exercising, well-being, psychological distress, and believes, though do not explain the experience of pain alone (45–47).

### Conclusions

The present study thus contributes to further knowledge about health-related quality-of-life measures and pain disease-specific qualitative and quantitative parameter criterions in preoperative patients with lumbar disc herniation disease. The provided methodology could be used in population-based studies or in clinical samples that focus on specific impairments and seek to control pain frequency and intensity, for example, follow-up assessments testing the effectiveness of surgical procedures performed, and to elicit the pathways leading to other impairments: functional limitations, disability, etc.

## Sergančiųjų juosmens tarpšlankstelių diskų išvarža gyvenimo kokybės ir skausmo įvertinimas

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**Raktažodžiai:** juosmens tarpšlankstelių diskų išvaržos, su sveikata susijusi gyvenimo kokybė, priešoperaciniai „SF-36“ klausimyno taškai, „McGill skausmo skalės“ lietuviškas atitikmuo, Oswestry negalios indeksas.

**Santrauka.** Tyrimo tikslas. Nustatyti „SF-36“, „Oswestry Negalios“, „McGill Skausmo skalės“ lietuviškojo varianto ir VAS (Vizualinės analoginės skalės) klausimynų, kaip papildomų atrankos metodų efektyvumą pacientams, sergantiems juosmens tarpšlankstelių diskų išvaržomis.

*Tirtųjų kontingentas ir tyrimo metodai.* Taikant minėtas gyvenimo kokybės vertinimo anketas, ištirti pacientai, kuriems diagnozuotos juosmens tarpšlankstelių diskų išvaržos. 100 pacientų operacinis gydymas buvo indikuotinas, 100 pacientų indikacijų operacijai nenumatyta.

*Rezultatai.* Susumavus „SF-36“ anketos duomenis, nustatyta, kad visų sferų vertinimai (balais ir procentais) labai skyrėsi pirmos grupės pacientų lyginant su antrosios grupės pacientais; taip pat apskaičiuotos vidutinės, bet statistiškai reikšmingos ( $p < 0,05$ ) koreliacijos tarp „SF-36“ kūno skausmo sferos bei VAS nugaros ir kojos skausmo ir tarp „SF-36“ klausimyno fizinės funkcijos bei stovėjimo/ėjimo gebėjimo (Oswestry) sferų. Remiantis „McGill skausmo skalės“ lietuviškojo atitikmens klausimynu, atlikta kiekybinė ir kokybinė skausmo deskriptorių analizė.

*Išvados.* Tyrimo metodika leidžia taikyti šiuos gyvenimo kokybės instrumentus populiacijų ir klinikinių tyrimų studijoms, tiriančioms specifinius pokyčius, siekiant kontroliuoti skausmo dažnį ir intensyvumą, tiriant atliktų operacijų efektyvumą bei ieškant sveikatos blogėjimo priežasčių.

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