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The Utility of Faces Pain Scale in a Chronic Musculoskeletal Pain Model

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Abstract

Objectives. The main aim of this study was to investigate the clinical utility and sensitivity to change of faces pain scale (FPS) in patients with shoulder pain, chosen as a chronic pain model. The secondary aim was to determine the association of FPS with psychologic status and quality of life of these patients.

Methods. Thirty Turkish patients with chronic shoulder pain were included in the study. Pain intensity was evaluated by visual analog scale (VAS), which is a commonly used pain scale besides FPS. Depression and quality of life were screened by Beck Depression Inventory (BDI) and Short Form-36 (SF-36). All assessments were done before and after the physical therapy.

Results. There was a statistically significant decrease in pain severity after the treatment as indicated by FPS and VAS ($P = 0.000$). The standardized response mean (SRM) value of FPS of 2.35 was accepted as a good responsiveness. The FPS showed a strong correlation with VAS (r = 0.62 and 0.73) both before and after the treatment. Also, moderate to strong correlations were detected between the FPS and physical functioning (PF), physical role (PR), bodily pain (BP), emotional role (ER), general health (GH), mental health (MH) subscales of SF-36 (r = –0.58–0.80), and BDI scores (r = 0.39) before the treatment. However, there were moderate and weak correlations with FPS and PR and social functioning (SF) subscales of SF-36 only after the treatment (r = –0.52 and r = –0.39).

Conclusions. FPS is a satisfactory tool to assess pain in patients with chronic pain conditions and demonstrates sensitivity to detect changes after the treatment.

Key Words. Faces Pain Scale; Sensitivity; Utility; Quality of Life; Depression

Introduction

Approximately 30–50% of adults living in a community report pain [1,2]. Pain is a subjective experience that may negatively impact quality of life and psychologic status of the patients. Inadequate assessment of pain hampers optimal pain management in clinical practice [3]. Thus, accurate assessment of pain with the most appropriate tool is very important for precise planning of treatment. Several instruments have been developed to assess different types of chronic pain conditions and their impact on function. A pain scale should be easy, simple, valid, able to detect changes in pain severity over time or after treatment, and culturally adaptable to the target patient population [4].

The faces pain scale (FPS) was originally developed for children and further found to be a valid tool in patients with cerebral palsy, young children, mature adults, and the elderly [5–9]. There are several versions of this scale such as 6, 7, 9, or 11 faces [9–11]. The FPS is easy to understand as it does not require reading or writing; thus, it is suitable for illiterate patients as well [9,12].

In our previous study, the validity of FPS was supported in stroke patients with shoulder pain [13]. Actually, there are some studies evaluating the sensitivity to change of FPS in the elderly mostly in the acute pain conditions [3,14,15]. Yet, to our knowledge, there is no any study evaluating the sensitivity to change of FPS in a chronic pain condition. So, the primary aim of this study was to further investigate the utility of FPS including the sensitivity to change in patients with a chronic pain condition. Shoulder pain was chosen as a pain model being one of the most common musculoskeletal problems

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encountered in the community [16]. The secondary aim of the study was to determine the relation of FPS to psychologic status and quality of life of these patients to seek whether pain has an effect on these parameters.

Methods

Patients

Thirty consecutive patients, who presented to an outpatient clinic within a university medical center in Turkey with chronic shoulder pain (at least 6 weeks duration), were enrolled to the study. The exclusion criteria were as follows: being under the age of 18, the presence of dislocation or subluxation of shoulder, history of prior local anesthetics or corticosteroid injection due to the shoulder pain in less than 3 months, pregnancy, being severely impaired in hearing or sight, the presence of psychiatric disorder that might affect the compliance and assessment, unwilling or unable to participate in the study. The study was approved by the Ethical Committee of the Ufuk University Faculty of Medicine, and all patients gave written informed consent.

The diagnoses of shoulder pain were based on physical examination, X-ray, and magnetic resonance imaging. The clinical characteristics (disease duration, localization of shoulder pain, and diagnoses) of the patients were recorded. Shoulder examination was done including goniometric measurement of range of motion (ROM).

Assessment of Pain

Shoulder pain was assessed by faces pain scale (FPS) and visual analog scale (VAS) in order to test convergent validity and sensitivity to change by treatment.

Faces Pain Scale

The FPS is a 7-point horizontal scale that defines the patients' feelings due to pain with seven facial expressions. First face represents "no pain" and seventh face represents "the worst possible pain," and the patients are asked to point to the face that expresses their current level of pain [9,10]. Face figures are scored between 0 and 6, the least score representing "no pain." FPS was shown to be valid in a Turkish patient population [13].

Visual Analog Scale

The VAS is scaled on a 10-cm horizontal line (0 cm: no pain; 10 cm: severe pain). The patients were asked to draw a mark on the line indicating the point at which best represents their overall pain intensity [17].

Assessment of Health-Related Quality of Life

The health-related quality of life was evaluated with Short Form-36 (SF-36) questionnaire. The SF-36 is composed of 36 items and 6 subscales: physical functioning (PF), physical role (PR), bodily pain (BP), emotional role (ER), general health (GH), and mental health (MH) [18,19]. The validity and reliability of Turkish version of SF-36 were shown by Kocyigit et al. [20].

Assessment of Depression

Beck Depression Inventory (BDI) that is consist of 21 items was used to screen the existing level of depression in patients [21]. The Turkish version of BDI was found to be reliable and valid by Hisli [22].

Treatment Intervention

Patients who were scheduled for physical therapy were included in the study to investigate the sensitivity of FPS. All patients were treated by physical therapy including hot pack, ultrasound (US), transcutaneous electrical nerve stimulation (TENS), and exercises for 15 days over 3 weeks. Hot packs were applied to the shoulder region for 15 minutes. The patients also received continuous US using a 2,776 Intellect Mobile Ultrasound device (Chattanooga, TN, USA) that operated at 1 MHz frequency and 1.5 W/cm^2 intensity. Slow circular movements were applied by the transducer head over the shoulder. The treatment duration was 10 minutes each occasion. Finally, TENS (30–40 Hz by means of conventional method) was applied for 15 minutes/session. Patients were instructed and recommended to do ROM and stretching exercises (for abductor and rotator muscle groups) during the physical therapy sessions and at home as well. Each exercise was requested to perform once a day with 10–15 repetitions.

All assessments were done at baseline and 2 weeks after the termination of physical therapy.

Statistical Evaluation

The mean values and distribution of parameters were assessed by descriptive statistics. All data are reported as mean ± standard deviation (SD) for continuous variables and frequency (percentage) for categorical variables. The change in all the assessment parameters with physical therapy were tested by Wilcoxon signed rank test. Correlations between the pain scales and other parameters were obtained by using the Spearman's correlation coefficient.

Responsiveness assesses the ability of the instrument to detect change. In this study, responsiveness was evaluated by standardized response mean (SRM: average score change/SD of score change) that is one type of effect size. A measure that has a high level of variability in change scores in relation to mean change will have a small SRM value. The SRM is sometimes referred to as a responsiveness-treatment coefficient [23] as well. Values of 0.20, 0.50, and 0.80 or greater have been proposed to represent small, moderate, and large responsiveness, respectively.

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Table 1 The characteristics of the patients with shoulder pain

	Patients (N, %)
Age, year (mean ± SD)	51.43 ± 10.38
Gender	
Female	18 (60)
Male	12 (40)
Education, year	
Illiterate	3 (10)
5	6 (20)
8	2 (6.7)
11	9 (30)
More than 11	10 (33.3)
Symptom duration, month (mean ± SD)	7.16 ± 9.25
Localization	
Right shoulder	15 (50)
Left shoulder	15 (50)
Diagnosis	
Impingement syndrome	9 (30)
Supraspinatus rupture	6 (20)
Supraspinatus tendinitis	4 (13.3)
Calcific tendinitis	3 (10)
Bicipital tendinitis	5 (16.7)
Osteoarthritis	3 (10)

SD = standard deviation.

Statistical analysis was conducted using the SPSS software version 16.0 (SPSS Inc., Chicago, IL, USA). Statistical significance was accepted at $P < 0.05$.

Results

Thirty patients (18 female, 12 male) with a mean age of 51.43 ± 10.38 years (30–77 years) with chronic shoulder pain were included in the study. The mean duration of pain was 7.16 ± 9.25 months. The characteristics of the subjects are given in Table 1.

All patients expressed understanding and completed the pain scales.

The results of baseline and second evaluations are shown in Table 2. After the treatment, there was a statistically significant decrease in pain severity, which was consistently observed by both pain scales ($P = 0.000$) (Table 2). A statistically significant improvement was obtained in ROM of shoulder joint in all three planes with the treatment ($P < 0.05$).

There were also statistically significant improvements in BDI scores ($P = 0.000$) and in six subscales of SF-36 (PF, PR, BP, GH, SF, ER; $P = 0.000$, $P = 0.001$, $P = 0.000$, $P = 0.009$, $P = 0.049$, and $P = 0.023$, respectively) (Table 2).

FPS showed a strong positive correlation with VAS ($r = 0.618$ and 0.728) both before and after the treatment. There were moderate to strong correlations between the FPS and some subscales of SF-36 (PF, PR, BP, GH, MH, ER; $r = -0.578$–0.800), and BDI scores ($r = 0.398$) at baseline. After the treatment, FPS showed moderate and weak negative correlations with PR and SF subscales of SF-36 only ($r = -0.516$ and $r = -0.396$). There was also a weak correlation between FPS and BDI scores after the treatment, which did not reach statistical significance. The correlation coefficients are given in Table 3.

It was found that the mean FPS decreased from 3.86 ± 1.40 to 1.37 ± 0.67 ($P < 0.001$), and the SRM value was 2.35, indicating good responsiveness and a large effect pre- to posttreatment.

Table 2 Pain severity, quality of life, and psychologic status of the patients before and after the treatment

	Pretreatment (Mean ± SD)	Posttreatment (Mean ± SD)	*P*
VAS	5.38 ± 2.42	2.10 ± 1.78	0.000
Faces pain scale	3.86 ± 1.40	1.37 ± 0.67	0.000
SF-36			
Physical functioning	47.55 ± 10.16	54.71 ± 9.65	0.000
Physical role	6.66 ± 12.16	21.10 ± 18.63	0.001
Bodily pain	47.87 ± 15.27	31.34 ± 14.00	0.000
Emotional role	30.00 ± 23.32	35.05 ± 21.52	0.023
General health	43.06 ± 6.18	39.58 ± 6.95	0.009
Vitality	37.22 ± 6.55	36.63 ± 6.89	0.333
Social functioning	38.00 ± 6.10	34.82 ± 5.74	0.049
Mental health	40.11 ± 5.79	38.85 ± 6.18	0.201
BDI	17.00 ± 7.75	14.00 ± 5.86	0.000

BDI = Beck Depression Inventory; SD = standard deviation; SF-36 = Short Form-36; VAS = visual analog scale.

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Table 3 The correlations between the faces pain scale and visual analog scale, Short Form-36, and Beck Depression Inventory

	FPS Pretreatment	FPS Posttreatment
VAS	0.618**	0.728**
SF-36 physical functioning	–0.578**	–0.065
SF-36 physical role	–0.550**	–0.516*
SF-36 bodily pain	0.800**	0.139
SF-36 emotional role	–0.487**	–0.251
SF-36 general health	0.429*	0.277
SF-36 vitality	0.011	–0.199
SF-36 social functioning	0.048	–0.396*
SF-36 mental health	–0.370*	–0.262
BDI	0.398*	0.279

* $P < 0.05$; ** $P < 0.01$.
BDI = Beck Depression Inventory; FPS = faces pain scale; SF-36 = Short Form-36; VAS = visual analog scale.

Discussion

Findings of this study showed that the FPS was sufficiently a valid tool with significant correlations with another commonly used pain scale in patients with shoulder pain. The results also demonstrated the sensitivity of the FPS in detecting changes in pain severity by significant decreases after the treatment. Furthermore, significant correlations were found between FPS and some subscales of SF-36 including physical functioning, physical role, bodily pain, emotional role, general health, mental health, and BDI scores before the treatment. After the treatment, significant improvements were detected in BDI and all subscales of SF-36 except vitality and MH subscales.

There are a few limitations of this study. First of all, patients' preferences of the pain assessment scales were not evaluated. Some of the authors reported that scales with faces were more preferred to other pain scales [6,14,15,24], whereas others reported just the opposite [25–27]. It should be considered that preference of a scale may affect the successful use of a scale. Second, we used FPS rather than the latest version of FPS-Revised (FPS-R). The FPS was revised by Hicks et al., which has six faces, and this provides an advantage of converting the scores to the metric scoring of 0–10 [28]. Also, the utility of FPS was tested only in a specific pain model in this study, so the results cannot be generalized to all pain conditions for our population.

Pain is a subjective and complex feeling that can be influenced by cognitive, social, and cultural factors. Assessment of pain with appropriate pain scales is the first step for optimal pain management. One of the most important aspects of a pain scale is that it can be easily understood and be applied by the patients. However, Herr et al. reported failures in completing some of the pain scales [3]. In the present study, all of the patients completed two pain scales successfully and had no difficulty in understanding the scales including illiterate patients. Another important aspect is the scale's validity. The FPS showed good correlations with VAS before and after the treatment. These data are consistent with our previous study [13]. Also, Kim and Buschmann used 0–10 version of FPS in older adults and found good correlations between FPS and VAS [9]. In a study of Herr et al., good correlations were demonstrated between FPS, VAS, 21-point numeric rating scale (NRS), verbal descriptor scale (VDS), and verbal numeric rating scale (VNS) [25]. Furthermore, strong correlations were reported between Iowa pain thermometer (IPT), NRS, VNS, FPS, and VAS in patients with chronic arthritic pain by Herr et al. [3]. All the above studies demonstrate that FPS is as successful as other pain scales.

Another important feature of a pain scale is the ability of detecting changes after the treatment. Herr et al. evaluated the pain intensity with IPT, NRS, VNS, FPS, and VAS pre- and postcorticosteroid joint injection, and all five pain scales were found to be sensitive in detecting changes in pain severity [3]. Li et al. used FPS-R, VAS, NRS, and VDS for evaluating analgesic efficacy in adult patients undergoing surgery from the day of surgery to the sixth postoperative day [14]. Significant decreases in all pain scales in postoperative days were reported. Furthermore, same authors supported their findings by their study in which they used FPS-R, NRS, and IPT in elderly patients [15]. In another study, the FPS-R and colored analog scale were applied to children for evaluating postoperative pain intensity after administration of analgesic and both scales were found to be sensitive [24]. Results of these studies are consistent with the current study as significant decreases were found in both pain scales and FPS showed a significant correlation with VAS after the treatment. Also, the SRM value was found to be high, indicating good responsiveness.

It is known that chronic pain may have an impact on pain-related quality of life of the patients. As shoulder joint plays an important role in activities of daily living such as reaching, weight-bearing, and overhead activities, the restriction in these activities may cause to a disability further affecting quality of life. Shoulder pain intensity was found to be related to impaired quality of life [29,30]. In two studies, pain severity assessed by VAS was associated with poor quality of life [31,32]. Similarly, FPS was found to be significantly correlated with some components of life quality in patients with shoulder pain before and after the treatment in the present study. Thus, it can be concluded that there is an apparent relationship between FPS and quality of life.

High prevalence of depression was reported in patients with chronic pain and it is known that mood disturbances affect pain severity adversely [33]. In patients with chronic pain, moderate correlation was reported between pain severity and depression which were assessed by VAS and

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BDI [34]. Pesonen et al. evaluated pain severity with four pain scales in demented patients and only FPS was found to be correlated with geriatric depression scale scores [35]. Consistent with these findings, in our study, significant correlation was detected between FPS and BDI scores before the treatment. After the treatment, there was a nonsignificant weak correlation that might be related to the multifaceted nature of depression.

Conclusions

In this study, we have presented additional support for the validity of the FPS to assess pain severity in a chronic shoulder pain population. It can be used for assessing pain severity in patients with chronic musculoskeletal pain conditions such as shoulder pain and seems to be sensitive to detect changes over time or by treatment. The scale is a suitable tool even in illiterate patients as it is easy, understandable, and does not require reading or writing.

References

1 Chung JW, Wong TK. Prevalence of pain in a community population. Pain Med 2007;8:235–42.

2 Moulin DE, Clark AJ, Speechley M, Morley-Forster PK. Chronic pain in Canada—Prevalence, treatment, impact and the role of opioid analgesia. Pain Res Manag 2002;7:179–84.

3 Herr K, Spratt KF, Garand L, Li L. Evaluation of the Iowa pain thermometer and other selected pain intensity scales in younger and older adult cohorts using controlled clinical pain: A preliminary study. Pain Med 2007;8:585–600.

4 von Baeyer CL. Children's self-reports of pain intensity: Scale selection, limitations and interpretation. Pain Res Manag 2006;11:157–62.

5 Bieri D, Reeve RA, Champion GD, Addicoat L, Ziegler JB. The faces pain scale for the self-assessment of the severity of pain experienced by children: Development, initial validation, and preliminary investigation for ratio scale properties. Pain 1990;41:139–50.

6 Stuppy DJ. The faces pain scale: Reliability and validity with mature adults. Appl Nurs Res 1998;11:84–9.

7 Hunter M, McDowell L, Hennessy R, Cassey J. An evaluation of the faces pain scale with young children. J Pain Symptom Manage 2000;20:122–9.

8 Boldingh EJ, Jacobs-van der Bruggen MA, Lankhorst GJ, Bouter LM. Assessing pain in patients with severe cerebral palsy: Development, reliability, and validity of a pain assessment instrument for cerebral palsy. Arch Phys Med Rehabil 2004;85:758–66.

9 Kim EJ, Buschmann MBT. Reliability and validity of the faces pain scale with older adults. Int J Nurs Stud 2006;43:447–56.

10 Benaim C, Froger J, Cazottes C, et al. Use of the faces pain scale by left and right hemispheric stroke patients. Pain 2007;128:52–8.

11 Silva FC, Thuler LC. Cross-cultural adaptation and translation of two pain assessment tools in children and adolescents. J Pediatr (Rio J) 2008;84:344–9.

12 Jaywant SS, Pai AV. A comparative study of pain measurement scales in acute burn patients. IJOT 2003;35:13–7.

13 Dogan SK, Ay S, Oztuna D, Aytur YK, Evcik D. The utility of faces pain scale in the assessment of shoulder pain in Turkish stroke patients: Its relation with quality of life and psychologic status. Int J Rehabil Res 2010;33:363–7.

14 Li L, Liu X, Herr K. Postoperative pain intensity assessment: A comparison of four scales in Chinese adults. Pain Med 2007;8:223–34.

15 Li L, Herr K, Chen P. Postoperative pain assessment with three intensity scales in Chinese elders. J Nurs Scholarsh 2009;41:241–9.

16 Hill CL, Gill TK, Shanahan EM, Taylor AW. Prevalence and correlates of shoulder pain and stiffness in a population-based study: The north west Adelaide health study. Int J Rheum Dis 2010;13:215–22.

17 Wewers ME, Lowe NK. A critical review of visual analogue scales in the measurement of clinical phenomena. Res Nurs Health 1990;13:227–36.

18 Brazier JE, Harper R, Jones NM, et al. Validating the SF-36 health survey questionnaire: New outcome measure for primary care. BMJ 1992;305:160–4.

19 Puhan MA, Gaspoz JM, Bridevaux PO, et al. Comparing a disease-specific and a generic health-related quality of life instrument in subjects with asthma from the general population. Health Qual Life Outcomes 2008;6:15.

20 Kocyigit H, Aydemir O, Fisek G, Olmez N, Memis A. Kısa form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. Romatizmal hastalığı olan bir grup hasta ile çalışma. İlaç ve Tedavi Dergisi 1999; 2:102–6.

21 Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561–71.

22 Hisli N. The validity and reliability of Beck Depression Inventory for university students. Psikoloji Derg 1989;7:3–13.

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23 Husted JA, Cook RJ, Farewell VT, Gladman DD. Methods for assessing responsiveness: A critical review and recommendations. J Clin Epidemiol 2000;53:459–68.

24 de Tovar C, von Baeyer CL, Wood C, et al. Postoperative self-report of pain in children: Interscale agreement, response to analgesic, and preference for a faces scale and a visual analogue scale. Pain Res Manag 2010;15:163–8.

25 Herr KA, Spratt K, Mobily PR, Richardson G. Pain intensity assessment in older adults. Use of experimental pain to compare psychometric properties and usability of selected pain scales with younger adults. Clin J Pain 2004;20:207–19.

26 Rodriguez CS, McMillan S, Yarandi H. Pain measurement in older adults with head and neck cancer and communication impairments. Cancer Nurs 2004;27:425–33.

27 Gagliese L, Weizblit N, Ellis W, Chan VWS. The measurement of postoperative pain: A comparison of intensity scales in younger and older surgical patients. Pain 2005;117:412–20.

28 Hicks CL, von Baeyer CL, Spafford PA, van Korlaar I, Goodenough B. The faces pain scale-revised: Toward a common metric in pediatric pain measurement. Pain 2001;93:173–83.

29 Gutierrez DD, Thompson L, Kemp B, Mulroy SJ. The relationship of shoulder pain intensity to quality of life, physical activity, and community participation in persons with paraplegia. J Spinal Cord Med 2007;30:251–5.

30 Lentz TA, Barabas JA, Day T, Bishop MD, George SZ. The relationship of pain intensity, physical impairment, and pain-related fear to function in patients with shoulder pathology. J Orthop Sports Phys Ther 2009;39:270–7.

31 Yildiz N, Topuz O, Gungen GO, et al. Health-related quality of life (Nottingham Health Profile) in knee osteoarthritis: Correlation with clinical variables and self-reported disability. Rheumatol Int 2010;30:1595–600.

32 Laursen BS, Bajaj P, Olesen AS, Delmar C, Arendt-Nielsen L. Health related quality of life and quantitative pain measurement in females with chronic non-malignant pain. Eur J Pain 2005;9:267–75.

33 Fishbain DA, Cutler R, Rosomoff HL, Rosomoff RS. Chronic pain associated depression: Antecedent or consequence of chronic pain? A review. Clin J Pain 1996;13:116–37.

34 Celikel FC, Saatcioglu O. Depressive symptoms in chronic pain patients. Anadolu Psikiyatri Derg 2003;4:20–5.

35 Pesonen A, Kauppila T, Tarkkila P, et al. Evaluation of easily applicable pain measurement tools for the assessment of pain in demented patients. Acta Anaesthesiol Scand 2009;53:657–64.

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