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The Influence of Fear Avoidance Beliefs on Disability and Quality of Life is Sparse in Spanish Low Back Pain Patients

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Study Design. Correlation between previously validated questionnaires.

Objectives. To assess the influence of fear avoidance beliefs (FAB) on disability and quality of life in Spanish low back pain (LBP) patients.

Summary of Background Data. FAB has shown to be a major determinant of disability in LBP patients in Northern European and Anglo-Saxon cultural environments. There are no data on its influence on Latin-Mediterranean patients.

Methods. The study was done in 12 primary care and 9 hospital services from seven different regions of Spain, with 209 patients who were in a potentially active working situation and visited the National Health Service for LBP. None was excluded and the sample was balanced for acute, subacute, and chronic patients. On their first visit and 14 days later, patients were given two independent Visual Analogue Scales (VAS) for LBP and leg pain, as well as the validated Spanish versions of the Fear Avoidance Beliefs (FABQ), Roland-Morris (RMQ), and SF-12 questionnaires.

Results. Correlations between LBP, leg pain, FABQ, disability, and quality of life were moderate on day 1 (r = 0.320–0.564) and stronger on day 15 (r = 0.457–0.637). All of them were statistically highly significant ($P = 0.000$). Regression models showed that LBP severity explains 33% of disability on day 1 and 20% on day 15, while FAB only explains 6% on day 1 and 2% on day 15. FAB does not explain mental quality of life. It explains only 5% of physical quality of life on day 1 and 4% on day 15. There was no interaction between FAB and chronicity, and FABQ values on day 1 did not predict disability or quality of life at day 15.

Conclusions. As opposed to what has been shown in other cultural settings, FAB have virtually no clinical relevance in Spanish LBP patients who are treated in the National Health Service and who are in a potentially active working situation. The influence of FAB on disability is minimal and much less than that of pain severity, and their contribution to the patient's quality of life is irrelevant. Further studies should explore the potential value of FAB in other Latin-Mediterranean countries.

Key words: low back pain, disability, fear avoidance beliefs, quality of life, determinants, correlation. **Spine 2005;30:E676-E682**

Nonspecific or common low back pain (LBP) is defined as pain between the costal margins and the inferior gluteal folds, usually accompanied by painful limitation of movement. It is often influenced by physical activities and postures and may be associated with referred or radiated leg pain. Diagnosing common LBP implies that the pain is not related to conditions such as fractures, spondylitis, direct trauma, or neoplastic, infectious, vascular, metabolic, or endocrine-related processes.[1,2]

It might seem obvious that the severity of LBP determines disability and quality of life. However, the influence of pain on disability, and the one of both parameters on quality of life, is more dependent on pain duration than on its severity.[3,4] An increase in pain or disability diminishes quality of life, and this influence increases as time passes so that pain and disability explain up to 73% of patients' quality of life 60 days after they request health care.[3,4] The influence of fear avoidance beliefs on quality of life is currently unknown.

Patients' quality of life is more dependent on the degree of disability than on severity of pain,[3,4] and most costs to society derive from patients' disability, not pain.[2,5] Therefore, treating disability and preventing its chronification are as important as treating pain. To this end, it is necessary to define the determinants of disability. In addition to pain severity and duration, fear avoidance beliefs (FAB) have been shown to influence disabil-

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ity in chronic patients.[6–15] According to available data, in acute patients, FAB do not explain current degree of disability, but they predict its chronification.[16]

Like other psychosocial factors, FAB are likely to be influenced by social and cultural factors. The social and cultural environments and the lifestyle in Northern European and Anglo-Saxon countries are quite different from those in Latin-Mediterranean countries, as commented in the Discussion. However, up-to-date studies exploring the influence of FAB on disability have only been conducted in Northern Europe,[6–14] Australia,[15] and the United States,[16] and no data are available on their influence in Southern Europe.

Therefore, the goals of the present study were to assess the influence of FAB on disability and quality of life in LBP patients seeking health care in the Spanish National Health Service.

■ Methods

The study was performed in 21 Health Care Centers from 7 different regions in Spain, which represent most of the cultural variation within the country. All the centers belonged to the Spanish National Health Service and were involved in the Spanish Back Pain Research Network. Participating centers included 12 primary care centers and 9 hospital outpatient clinics in orthopedic surgery, rheumatology, and neurosurgery.

The study was carried out with patients who consulted their physician for LBP between Dec. 20, 2002 and July 19, 2004. Inclusion criteria were LBP, with or without leg pain, having a potentially active work situation (*i.e.*, employed or on sick leave, but not unemployed or retired), and being able to read Spanish.

Exclusion criteria were: functional illiteracy (mental status insufficient to complete the Spanish version of the Roland Morris Questionnaire [RMQ] or FABQ),[17,18] treated or untreated central nervous system impairment, direct trauma to the spine, criteria for referral to surgery (progressive motor deficit lasting 6 weeks or more, sphincter impairment of neurologic cause; disabling sciatic pain (in the absence of backache) caused by a compromised nerve root demonstrated by magnetic resonance (MRI) or computed tomography (CT) studies; symptomatic spinal stenosis (defined as claudication unrelated to peripheral vascular disease with evidence of stenosis on MRI or CT scans) and "red flags" for potential systemic disease (oncologic disease during the previous 5 years, constitutional symptoms [unexplained weight loss, fever, chills], recent urinary tract infection, history of intravenous drug use, or immunocompromised host).[2]

To ensure a sufficient number of acute, subacute, and chronic patients, the sample size of the study was established at 200 patients, with a minimum of 40 in each chronicity subgroup. The limit between acute and subacute pain was established at 14 days,[3,4] and the limit between subacute and chronic at 90 days.[19]

Patients were seen on the day of admission to the study (day 1) and 14 days later (day 15). This time frame was based on previous studies that have shown that period to be appropriate to assess variations in the influence of pain on disability and the one of pain and disability on quality of life, irrespective of patients' previous duration of pain.[3,4] At the first visit, the following variables were recorded on the data collection form: sex, age, educational level, family situation, work status, work situation, results of the straight leg raising test (SLR), which was performed only on patients with leg pain, duration of pain when entering the study, chronicity (acute/subacute/chronic), and treatment when entering the study. Current treatment when entering the study was recorded as drug treatment (indicating each kind of drug and recoded as "yes" or "no" at the analysis phase), traditional biomechanic education, specific education on active management, passive physiotherapy (electrotherapy or massage, recorded separately and recoded as "yes" or "no" in the analysis phase), exercise, rehabilitation, surgery (recording the different techniques used and recoded as "yes" or "no" in the analysis phase), and other treatments (Table 1). At the day 15 visit, treatments received between the first and second visits were also recorded.

At both visits, patients were given two separate Visual Analogue Scales (VAS)[20] for measuring low back and leg pain, and the validated Spanish versions of the RMQ,[18] the FABQ,[17] and the SF-12 questionnaire.[21] VAS values range from 0 (no pain) to 10 (worst pain imaginable). RMQ values range from 0 (no disability) to 24 (maximum possible disability), and FABQ scores range from 0 (no fear avoidance beliefs) to 96 (maximum fear avoidance beliefs). Within the FABQ, FAB-Phys relates to fear avoidance beliefs about physical activity (range, 0–24) and FAB-Work relates to fear avoidance beliefs about work (range, 0–36), although the total FAB score has shown to be at least as valid and reliable as those two subscales and was therefore used in this study.[17] Within the SF-12 questionnaire, the physical (PCS-SF12) and the mental (MCS-SF12) component summaries relate to quality of life depending on physical and mental factors, respectively. Both components are normalized for the Spanish population, so its mean is 50 and its standard deviation is 10. Values of the Spanish version of PCS-SF12 range from 2.86 (worst possible physical quality of life) to 71.67 (best possible), and those of MCS-SF12 range from 11.61 (worst possible mental quality of life) to 71.24 (best possible).

All self-assessment questionnaires were given by administrative staff, and the patients filled them out on their own and alone, without the presence of staff or accompanying persons. The completed instruments were then given to the treating physician, who stapled scales and questionnaires to the patient's data collection form and calculated the scores of the VAS scales, the RMQ and the FAB questionnaire. Since the calculation of PC-SF12 and MCS-SF12 scores is complex, this was done during the analysis phase.

Data were entered in the database at a centralized coordination office by two administrative assistants who double-checked that the entered data coincided with the scores of the two VAS scales, the RMQ and the FABQ, and with the answers to the SF-12 questionnaire.

Analysis. The scores of PCS-SF12 and MCS-SF12 for days 1 and 15 were calculated following the standardized methods.[6,21]

Simple correlations between the scores of the different scales were obtained through Spearman's correlation coefficient.

Two linear regression models were used to assess the factors explaining the variance of disability on days 1 and 15.[22] Disability was the dependent variable, and the maximal model included sex, age, chronicity (acute/subacute/chronic), sick leave (yes/no), presence of leg pain (yes/no), SLR test (not performed/0°–30°/30°–60°/>60°), severity of LBP (VAS), values of FAB, MCS-SF12, and PCS-SF12 at the corresponding assessment, and the interaction between FAB and chronicity. Chro-

Table 1. Characteristics of Study Participants (n = 209)

Variable	Value
Gender [n (%)]	
Female	121 (57.9)
Male	88 (42.1)
Age (yr) [median (P25, P75)]	45.7 (38.8–54.3)
Duration (days) [median (P25, P75)]	20.0 (7.0–180.0)
Chronicity [n (%)]	
Acute (1–13 days)	64 (30.6)
Subacute (14–90 days)	47 (22.5)
Chronic (>90 days)	98 (46.9)
Marital status [n (%)]	
Single	37 (17.7)
Married	147 (70.3)
Widowed	6 (2.9)
Divorced	14 (6.7)
Other	2 (1.0)
Missing	3 (1.4)
Educational level [n (%)]	
Incomplete elementary school	35 (16.8)
Elementary school	71 (34.0)
High school	56 (26.8)
University	41 (19.6)
Missing	6 (2.9)
Work status [n (%)]	
Self-employed	26 (12.4)
Employed	163 (78.0)
Other	9 (4.3)
Missing	11 (5.3)
Work situation [n (%)]	
Working	121 (57.9)
On sick leave	82 (39.2)
Missing	6 (2.9)
Straight leg raising [n (%)]	
Not performed	38 (18.2)
<30°	30 (14.4)
30°–60°	43 (20.6)
>60°	68 (32.5)
Missing	30 (14.4)
Drug treatment [n (%)]	
No	14 (6.7)
Yes	195 (93.3)
Education (traditional biomechanic) [n (%)]	
No	143 (68.4)
Yes	66 (31.6)
Education (active management) [n (%)]	
No	194 (92.8)
Yes	15 (7.2)
Physiotherapy (passive) [n (%)]	
No	159 (76.1)
Yes	50 (23.9)
Exercise [n (%)]	
No	173 (82.8)
Yes	36 (17.2)
Rehabilitation [n (%)]	
No	183 (87.6)
Yes	26 (12.4)
Surgery [n (%)]	
No	188 (89.9)
Yes	21 (11.1)
Other treatments [n (%)]	
No	200 (95.7)
Yes	9 (4.3)
Radiographs [n (%)]	
No	65 (31.1)
Yes	144 (68.9)
CT scan [n (%)]	
No	176 (84.2)
Yes	33 (15.8)
MRI [n (%)]	
No	123 (58.9)
Yes	86 (41.1)
Neurophysiologic tests [n (%)]	
No	193 (92.3)
Yes	16 (7.7)
Blood analyses [n (%)]	
No	162 (77.5)
Yes	47 (22.5)

nicity and the SLR test were coded as dummy variables. In the model for day 15, the FAB score at day 1 was also included.

Four linear regression models were also used to assess the factors explaining the variance of both mental and physical components of quality of life, on days 1 and 15. MCS-SF12 and PCS-SF12 were the dependent variables and the maximal models included sex, age, chronicity (acute/subacute/chronic), sick leave (yes/no), presence of leg pain (yes/no), SLR test (not performed/0°–30°/30°–60°/>60°), severity of LBP (VAS), disability (RMQ), total FAB score at the corresponding assessment, and the interaction between FAB and chronicity. Chronicity and the SLR test were coded as dummies. In the model for day15, the FAB score at day 1 was also included.

In each case, the colinearity of the maximal model was evaluated using the criteria proposed by Belsley.[23] A backward elimination strategy was used, so that the variable with the highest P value not significant at the 0.05 level was excluded at each step. The order of the variables to assess the change of the models in R^2 was determined by standardized coefficients,[24] and the normality of residuals was assessed graphically and through the Kolmororv-Smirnov test.[22]

The SPSS statistical package for Windows, version 12, was used for statistical analysis (SPSS Inc., Chicago, IL).

■ Results

A total of 209 patients were recruited (93 from primary care centers and 116 from the hospital setting), and none was excluded. Table 1 shows the characteristics of the study subjects, and Table 2 contains values for scores on the VAS, RMQ, SF-12, and FABQ scales, for days 1 and 15. Data are given as median (P25, P75) since only those from the RMQ had a normal distribution.

Correlations between LBP, leg pain, disability, FAB, and quality of life are shown in Tables 3 (day 1) and 4 (day 15). At both assessments, disability correlated significantly with FAB and pain, although correlations with the latter were stronger. FAB correlated more strongly with physical than with mental quality of life, and correlations with both types of quality of life at both assessments were stronger with FAB than with pain.

The FAB had to be centered because of collinearity problems in the four models on quality of life. Analysis of residuals showed the appropriateness of all the models.

Table 2. Fear Avoidance, Pain, Disability, and Quality of Life in Study Participants

	Day 1		Day 15	
Variable	N	Value	N	Value
FAB total score*	176	66.0 (44.3,80.8)	167	61.0 (41.0,83.0)
Low back pain (VAS)	205	6.2 (3.7,8.0)	199	5.5 (2.0,7.5)
Leg pain (VAS)	146	5.9 (3.0,8.0)	139	5.5 (2.0,7.6)
Disability (RM)	204	12.0 (7.0,16.0)	201	11.0 (4.3,16.5)
Quality Life Physical (PCS-12)	198	32.2 (27.6,40.0)	172	32.6 (28.0,39.5)
Quality Life Mental (MCS-12)	198	47.2 (33.4,54.6)	172	46.5 (31.0,55.2)

VAS = Visual Analogue Scale; RM = Roland Morris Questionnaire; PCS-12 = Physical Component Summary of SF-12; MCS-12 = Mental Component Summary of SF-12.
*FAB (total score): sum of scores of the 16 items in the scale. Only for patients who answered all the items in the corresponding questionnaire or subscale.

Table 3. Spearman Correlation Coefficients Between Pain, Disability, Fear Avoidance Beliefs, and Quality of Life (Day 1)

	Low Back Pain (VAS)	Leg Pain (VAS)	Disability (RM)	PCS-SF12	MCS-SF12
FAB (total score)*	0.398	0.320	0.522	−0.432	−0.361
P	0.000	0.000	0.000	0.000	0.000
n	175	123	172	169	169
Low back pain (VAS)		0.652	0.564	−0.352	−0.268
P		0.000	0.000	0.000	0.000
n		145	200	195	195
Leg pain (VAS)			0.411	−0.273	−0.235
P			0.000	0.000	0.003
n			144	138	138
Disability (RM)				−0.474	−0.349
P				0.000	0.000
n				193	193

VAS = Visual Analogue Scale; RM = Roland Morris Questionnaire; PCS-12 = Physical Component Summary of SF-12; MCS-12 = Mental Component Summary of SF-12.
*FAB (total score): sum of scores of the 16 items in the scale.

On day 1, the severity of LBP explained 33% of disability, and FAB 6% (Table 5). On day 15, severity of pain explained 20% of disability, and FAB 2% (Table 6).

On day 1, physical quality of life was explained by disability (24%), FAB (5%), and the existence of leg pain (3%). On that day, the mental component of quality of life was explained by disability (18%) and chronicity (4%), with neither pain severity nor FAB influencing it (Tables 7, 8).

On day 15, physical quality of life was explained by disability (34%) and FAB (4%), while mental quality of life was explained by disability (20%) and chronicity (3%).

There was no interaction between FAB and chronicity in any model. Hence, the influence of FAB on disability and quality of life was similar across acute, subacute, and chronic patients.

■ Discussion

These results suggest that FAB are virtually irrelevant in LBP patients who are in a potentially active work situation and seek health care in the Spanish National Health Service. In those patients, the influence of FAB on disability is sparse and much less than the one of pain severity. FAB explain less than 5% of physical quality of life. Furthermore, FAB explain nothing of mental quality of life, and FABQ scores on day 1 do not predict either disability or quality of life on day 15.

There are some potential limitations to the generalizability of these results. The study was conducted in the Spanish National Health Service, which is free and available to all residents of Spain. In theory, this might compromise generalizability to the small minority of patients seeking health care only in the private sector. All patients had to be in a potentially active work situation, so this might compromise generalizability to the nonworking population (*e.g.*, elderly or retired population). Generalizability to these populations should be explored in future studies.

The representativeness of the sample among the Spanish working population seeking health care for LBP in the Spanish National Health Service is not a major concern. The seven Spanish regions from which patients were recruited represent the entire cultural and economic spectrum of the 17 regions in the country, participants were recruited both in the primary care and the hospital setting, no data suggest that patients from the rest of the country are different, and the treatment they were having was consistent with the one routinely used within the Spanish National Health Service (Table 1).[25] In addition, all patients complying with inclusion criteria were in-

Table 4. Spearman Correlation Coefficients Between Pain, Disability, Fear Avoidance, and Quality of Life (Day 15)

	Low Back Pain (VAS)	Leg Pain (VAS)	Disability (RMQ)	PCS-SF12	MCS-SF12
FAB (total score)*	0.564	0.457	0.637	−0.503	−0.372
P	0.000	0.000	0.000	0.000	0.000
n	161	113	162	147	147
Low back pain (VAS)		0.715	0.684	−0.493	−0.321
P		0.000	0.000	0.000	0.000
n		139	199	171	171
Leg pain (VAS)			0.508	−0.421	−0.283
P			0.000	0.000	0.002
n			139	118	118
Disability (RM)				−0.611	−0.429
P				0.000	0.000
n				172	172

VAS = Visual Analogue Scale; RM = Roland Morris Questionnaire; PCS-12 = Physical Component Summary of SF-12; MCS-12 = Mental Component Summary of SF-12.
*FAB (total score): sum of scores of the 16 items in the scale.

Table 5. Regression Analysis of Disability (Day 1)

	Coefficients (95% CI)	*P*	R^2 Change
LBP	0.738 (0.480, 0.997)	0.000	0.331
PCS-12	−0.152 (−0.227, −0.077)	0.000	0.086
FAB (total score)*	0.055 (0.021, 0.088)	0.001	0.064
MCS-12	−0.086 (−0.137, −0.035)	0.001	0.033

LBP = low back pain; PCS-12 = Physical Component Summary of SF-12; MCS-12 = Mental Component Summary of SF-12; CI = confidence interval.
*FAB (total score): Sum of scores of the 16 items in the scale.

cluded and none were excluded, they represent different socioeconomic strata, and the sample was balanced for acute, subacute, and chronic patients (Table 1).

Correlation between all variables was higher at day 15 than at day 1 (Tables 3, 4). Several factors may theoretically contribute to that increase, such as recall bias, method variance, the actual evolution of those variables and their reciprocal influences, or other potential unknown confounders. At present, it is impossible to quantify the relative influence of those factors, but these results are consistent with those from previous studies, which have shown that the influence of pain and disability on quality of life progresses constantly as time passes, that such increase is especially steep in the first 14 days irrespective of previous duration of pain, and that both pain and disability are the main determinants of quality of life after 14 days.[3,4]

The clear negative influence of disability on mental and physical quality of life and the slight negative influence on the latter of an SLR test suggesting radiculopathy were to be expected. Similarly, the slight negative influence of leg pain on physical quality of life and the one of LBP being chronic on mental quality of life were also to be expected. However, results related to the sparse influence of FAB on disability were surprising and are in conflict with those from previous reports.[6–16] Differences in results may derive from differences in demographic, clinical, or sociocultural characteristics of the included patients. Demographic and clinical characteristics of patients who participated in those studies are similar to those in the current study except for chronicity and

Table 6. Regression Analysis of Disability (Day 15)

	Coefficients (95% CI)	*P*	R^2 Change
PCS-12	−0.239 (−0.328, −0.151)	0.000	0.378
LBP	0.689 (0.420, 0.957)	0.000	0.202
MCS-12	−0.119 (−0.175, −0.063)	0.000	0.085
FAB (total score)*	0.056 (0.019, 0.093)	0.004	0.022
SLR		0.022	0.021
30°	3.602 (1.384, 5.820)		
30°–60°	2.828 (0.969, 4.686)		
>60°	1.617 (−0.056, 3.289)		
Gender	−1.700 (−3.068, −0.331)	0.015	0.012

PCS-12 = Physical Component Summary of SF-12; LBP = low back pain; MCS-12 = Mental Component Summary of SF-12; SLR = Straight Leg Raising Test (reference category "not performed"); Gender (coded as: 0 = female; 1 = male); CI = confidence interval.
*FAB (total score): sum of scores of the 16 items in the scale.

Table 7. Regression Analysis of Quality of Life (Day 1)

	Coefficients (95% CI)	*P*	R^2 Change
MCS-12			
RM	−0.693 (−1.003, −0.382)	0.000	0.117
Chronicity*		0.014	0.039
Subacute	−3.311 (−8.049, 1.427)		
Chronic	−6.006 (−10.033, −1.979)		
PS-12			
RM	−0.551 (−0.817, −0.285)	0.000	0.238
FAB (total score)†	−0.097 (−0.163, −0.030)	0.005	0.049
PLP	−3.704 (−6.556, −0.852)	0.011	0.028

RM = Roland Morris Questionnaire; MCS-12 = Mental Component Summary of SF-12; PS-12 = Physical Component Summary of SF-12; PLP = presence of leg pain.
*The reference category for chronicity was "acute."
†FAB (total score) = sum of scores of the 16 items in the scale.

working status. Therefore, the potential influence of these differences on results should be discussed.

A previous study conducted with acute patients found that FAB did not explain current disability, but they predicted its chronification at 4 weeks.[16] The current study included acute and subacute patients, but FAB showed no predictive value on disability or quality of life 14 days later. Although 14 days has been shown to be a suitable deadline for assessing changes related to disability and quality of life in this setting,[3,4] baseline FABQ scores might have a higher predictive value at longer periods, and this possibility should be explored in future studies.

In contrast with the present study, all of the studies previously conducted with chronic patients found the influence of FAB on disability to be relevant,[6–15] or even its main determinant.[6–11] As opposed to those studies, the present one includes a balanced sample of acute, subacute, and chronic patients (Table 1). Results show that there was no interaction between FAB and chronicity, so differences in the chronicity of included patients cannot satisfactorily explain the difference in results from the current study. However, only 25% of patients included in this study had a duration of pain over 180 days. FAB might have a more relevant influence on disability in Spanish patients with a longer episode duration, and this possibility should be explored in future studies.

The wealth of the Spanish economy roughly represents the average of the European Union, the seven Spanish regions from which patients were recruited represent

Table 8. Regression Analysis of Quality of Life (Day 15)

	Coefficients (95% CI)	*P*	R^2 Change
MCS-12			
RM	−0.699 (−0.968, −0.430)	0.000	0.195
Chronicity*		0.037	0.031
Subacute	−3.877 (−8.788, 1.033)		
Chronic	−5.717 (−10.087, −1.347)		
PS-12			
RM	−0.613 (−0.812, −0.414)	0.000	0.339
FAB (total score)†	−0.103 (−0.166, −0.041)	0.001	0.044

RM = Roland Morris Questionnaire; MCS-12 = Mental Component Summary of SF-12; PS-12 = Physical Component Summary of SF-12.
*The reference category for chronicity was "acute."
†FAB (total score) = sum of scores of the 16 items in the scale.

the entire economic spectrum of the country, and the sample included patients from all economic strata (Table 1). The Spanish National Health Service is free and available to all residents of Spain, and only a small minority of patients in the upper economic class seek health care in the private sector only, as is likely to be the case in most other countries with a National Health Service where previous studies were conducted.[6–14] Therefore, there are no data to suggest that there are potential major economic differences in the population included in these studies, which might explain differences in their results.

Most of the previous studies, including the one in which the FAB was originally developed,[6] included patients both on and off work. In the current study, as inclusion criteria all patients had to be in a potentially active work situation. The Spanish insurance and work compensation system is similar to most European countries, and there is no economic pressure for employees on sick leave to return to work. They are paid up to 100% of their income for up to 18 months, and after that period they can either return to work or be classified as "permanently disabled," in which case they get a compensation for the rest of their life. Since 11 of the 16 items in FABQ only apply to the potentially active work population, having included only this kind of patients should have made it easier for the current study to detect the influence of FAB on disability. However, this was not the case, and when the influence of both subscales of FAB (FAB-Work and FAB-Phys) was analyzed separately, neither one proved to have a greater influence than the total FAB score in any model (data not shown). Therefore, potential differences in the insurance systems and work status of the study population cannot explain the differences in results with those from previous studies.

Differences in social and cultural factors associated with the geographic setting where the studies took place might account for differences in results because they may modify the influence of FAB on disability. For instance, these social and cultural factors could include different management strategies of fear derived from the Catholic and Protestant cultures, the tendency to worry about the potential consequences of one's health on one's future work or physical ability, the degree of confidence in the welfare state, or family or social support, to compensate for such potential consequences (as opposed to actions promoted by oneself), the credibility of prognosis suggested by health care providers, or the relative importance of work (when compared with leisure and "joie de vivre") in life. These social and cultural differences might explain the sparse influence of FAB on disability in Spanish patients and would suggest that disability associated with LBP could be more influenced by FAB in some cultures and by severity of pain in others. Should that be the case, it could also explain why biologically oriented treatments, which have shown to be effective on pain, have also consistently proven to improve disability in Spanish LBP patients,[26–28] whereas education-oriented measures with no effect on pain have shown to improve disability in U.K. patients.[29] To the authors' knowledge, the current study is the first one to have explored the influence of FAB in a Latin-Mediterranean country, and previous results that are closer to the current ones are those obtained in France,[12] which may be seen as a country mixing Northern (Anglo-Saxon) and Southern (Latin-Mediterranean) European lifestyles. Should the results of this study be interpreted as suggesting actual differences in determinants of disability deriving from social and cultural factors, the influence of FAB in other Latin-Mediterranean countries should be further explored in future studies.

Based on the influence on disability that FAB have shown in Northern European and Anglo-Saxon countries, improving them is currently seen by the international scientific community as a major goal for LBP patients. Treatments to achieve it range from measures as simple as handing out a booklet[29] to complex cognitive behavioral psychological treatments, for which there is strong evidence showing a positive, although small, clinical effect.[30] Since this study shows that the clinical influence of FAB in a Latin-Mediterranean setting is virtually irrelevant and those forms of treatment have not been assessed in that environment, the corresponding randomized controlled trials should be undertaken before recommending a wider use of those procedures in this particular setting.

■ Conclusion

This study suggests that, in Spanish LBP patients who are in a potentially active work situation, FAB have virtually no clinical relevance; their influence on disability is sparse and much less than that of pain severity, and their contribution to the patient's quality of life is irrelevant. These results further confirm that conclusions on variables that may be influenced by cultural factors should be explored in different cultural settings.

■ Key Points

- A sample was constituted with 209 Spanish patients who were treated in the National Health Service and were in a potentially active working situation. The sample was balanced for acute, subacute, and chronic low back pain.
- Validated scales and questionnaires were used to assess pain, disability, quality of life, and fear avoidance beliefs (FAB) on the first visit and 14 days later.
- Pain severity was the main determinant of disability, and disability was the main determinant of physical and mental quality of life. At different assessments, FAB only explained 2% to 6% of disability and 1% to 5% of physical quality of life. It had no influence on mental quality of life. FAB on day 1 did not predict disability or quality of life at day 15. These results were consistent for acute, subacute, and chronic patients.

• As opposed to what has been shown in Northern European and Anglo-Saxon environments, FAB have virtually no clinical relevance in Spanish LBP patients. Further studies should explore the potential value of FAB in other Latin-Mediterranean countries.

References

1. Deyo RA, Cherkin D, Conrad D, et al. Cost, controversy, crisis: low back pain and the health of the public. *Annu Rev Publ Health* 1991;12:141–56.
2. Waddell G. *The Back Pain Revolution*. Edinburgh: Churchill Livingstone, 1998.
3. Kovacs FM, Abraira V, Zamora J, et al. Correlation between pain, disability and quality of life in patients with common low back pain. *Spine* 2004;29: 206–10.
4. Kovacs FM, Abraira V, Zamora J, et al. The transition from acute to subacute chronic low back pain: a study based on determinants of quality of life and prediction of chronic disability. *Spine* In press.
5. van Tulder MW, Koes BW, Bouter LM. A cost-of-illness study of back pain in The Netherlands. *Pain* 1995;62:233–40.
6. Waddell G, Newton M, Henderson I, et al. A fear-avoidance beliefs questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain* 1993;52:157–68.
7. Woby SR, Watson PJ, Roach NK, et al. Adjustment to chronic low back pain: the relative influence of fear-avoidance beliefs, catastrophizing, and appraisals of control. *Behav Res Ther* 2004;42:761–4.
8. Woby SR, Watson PJ, Roach NK, et al Are changes in fear-avoidance beliefs, catastrophizing, and appraisals of control, predictive of changes in chronic low back pain and disability? *Eur J Pain* 2004;8:201–10.
9. Staerkle R, Mannion AF, Elfering A, et al. Longitudinal validation of the fear-avoidance beliefs questionnaire (FABQ) in a Swiss-German sample of low back pain patients. *Eur Spine J* 2004;13:332–40.
10. Pfingsten M, Kroner-Herwig B, Leibing E, et al. Validation of the German version of the Fear-Avoidance Beliefs Questionnaire (FABQ). *Eur J Pain* 2000;4:259–66.
11. Crombez G, Vlaeyen JWS, Heuts PHTG, et al. Pain-related fear is more disabling than pain itself: evidence on the role of pain-related fear in chronic back pain disability. *Pain* 1999;80:329–39.
12. Chaory K, Rannou F, Fermanian J, et al. Impact of functional restoration programs on fears, avoidance and beliefs in chronic low back pain patients. *Ann Readapt Med Phys* 2004;47:93–7.
13. Mannion AF, Junge A, Taimela S, et al. Active therapy for chronic low back pain. Part 3. Factors influencing self-rated disability and its change following therapy. *Spine* 2001;26:920–9.
14. van den Jout JHC, Vlaeyen JWS, Heuts PHTG, et al. Functional disability in nonspecific low back pain: the role of pain-related fear and problem-solving skills. *Int J Behav Med* 2001;8:134–8.
15. Ayre M, Tyson GA. The role of self-efficacy and fear-avoidance beliefs in the prediction of disability. *Aust Psychologist* 2001;36:250–3.
16. Fritz JM, George SZ, Delitto A. The role of fear-avoidance beliefs in acute low back pain: relationships with current and future disability and work status. *Pain* 2001;94:7–15.
17. Kovacs FM, Muriel A, Medina JM, et al. Psychometric characteristics of the Spanish version of the FAB Questionnaire. *Spine* In press.
18. Kovacs FM, Llobera J, Gil del Real MT, et al. Validation of the Spanish versión of the Roland-Morris questionnaire. *Spine* 2002;27:538–42.
19. Merskey H, Bogduk N. Description of chronic pain syndromes and definitions of pain terms. In: *Classification of Chronic Pain*, 2nd ed. Seattle: IASP Press, 1994.
20. Huskisson EC. Measurement of pain. *Lancet* 1974;2:1127–31.
21. Gandek B, Ware JE, Aaronson NK, et al. Cross validation of items selection and scoring for the SF-12 health survey in nine countries: results from the IQOLA project. *J Clin Epidemiol* 1998;51:1171–8.
22. Kleinbaum DG, Kupper LL, Muller KE. *Applied Regression Analysis and Other Multivariable Methods*, 2nd ed. Boston: PWS-Kent, 1988.
23. Belsely DA. *Conditioning Diagnostics: Collinearity and Weak Data in Regression*. New York: John Wiley & Sons, 1991.
24. Truett J, Cornfield DJ, Kannel W. A multivariate analysis of the risk of coronary heart. *J Chron Dis* 1967;20:511–24.
25. González-Urzelai V, Palacio-Elua L, Lopez de Munain J. Routine primary care management of acute low back pain: adherence to clinical guidelines. *Eur Spine J* 2003;12:589–94.
26. Kovacs FM, Llobera J, Abraira V, et al. Effectiveness and cost-effectiveness analysis of neuroreflexotherapy for subacute and chronic low back pain in routine general practice: a cluster randomized, controlled trial. *Spine* 2002; 27:1149–59.
27. Urrútia G, Burton AK, Morral A, et al. Neuroreflexotherapy for non-specific low-back pain (Cochrane Review). In: *The Cochrane Library*, Issue 2. Chichester, UK: John Wiley & Sons, 2004.
28. Grupo PINS. Transferencia a la práctica rutinaria del Sistema Nacional de Salud de la investigación sobre el uso de la intervención neurorreflejoterápica para el tratamiento de las patologías mecánicas del raquis. Resultados de una experiencia piloto. *Gac Sanit* 2004;18:275–86.
29. Burton AK, Waddell G, Tillotson M, et al. Information and advice to patients with back pain can have a positive effect: a randomized controlled clinical trial of a novel educational booklet in primary care. *Spine* 1999;24: 2484–91.
30. van Tulder MW, Ostelo RW, Vlaeyen JW, et al. Behavioural treatment for chronic low back pain (Cochrane Review). In: *The Cochrane Library*, Issue 3. Chichester, UK: John Wiley & Sons, 2004.