

PAIN & AGING SECTION

Original Research Article

The Influence of Psychological Factors on Low Back Pain-Related Disability in Community Dwelling Older Persons

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ABSTRACT

Objectives. To assess the influence of fear avoidance beliefs (FAB) and catastrophizing on low back pain (LBP)-related disability in Spanish community dwelling retirees.

Design. Correlation between variables measured with previously validated instruments.

Setting. Majorca, Spain.

Patients. 1,044 community dwelling subjects attending conferences for retired persons.

Outcome Measures. Visual analog scales for LBP and pain referred to the leg (LP), Roland Morris Questionnaire (RMQ) for disability, FAB-Phys questionnaire (FABQ) for FAB, and the Coping Strategies Questionnaire (CSQ) for catastrophizing.

Results. In subjects without clinically relevant LBP, FAB correlated moderately with catastrophizing ($r = 0.535$) and disability ($r = 0.390$), and weakly with LP ($r = 0.119$) and LBP ($r = 0.197$). In subjects with LBP, FAB correlated moderately with catastrophizing ($r = 0.418$) and disability ($r = 0.408$), and weakly with LP (0.152), but not with LBP. Correlations among CSQ, FABQ, and RMQ were similar in subjects with and without current LBP. In regression models, the coefficient for effect of FAB on disability was 0.14 for participants with no LBP, and 0.28 for those with pain. Corresponding values for catastrophizing were 0.17 and 0.19.

Conclusion. In Spanish community dwelling retirees, the influence of FAB and catastrophizing on LBP-related disability is clinically small.

Key Words. Low Back Pain; Elderly; Disability; Fear Avoidance Beliefs; Catastrophizing

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Introduction

Non-specific 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 pain referred to the leg

(LP). 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].

In the United States, more than one in three community dwelling older persons suffers from LBP [3]. In the elderly, LBP is associated with self-reported difficulties for performing tasks necessary for daily living, and LBP-related disability can lead to a decrease in general activities and rapidly affect their general health status [3]. The relationship between musculoskeletal pain and disability in older persons has already been well established [4–6], and disability is one of the main determinants of quality of life [2,7–9]. Therefore, it is important to identify determinants of disability in the elderly, in order to set up programs to improve it.

Psychological factors influence disability associated with musculoskeletal pain in the elderly [10,11]. However, their influence seems to vary depending on age and cultural environment. Fear avoidance beliefs (FAB) are beliefs about physical activity that are related to an exaggerated pain perception [2]. In Spanish subjects—and potentially other Southern European environments—pain severity and pain duration are the most important determinants of LBP-related disability [8,9,12–14], and the influence of FAB weakens as subjects' age increases: It is negligible in middle aged LBP-patients and nonexistent in institutionalized elderly subjects [12–14]. On the contrary, in Anglo-Saxon and Northern European middle-aged patients, FAB are the main determinant of disability [15–30], and in the United States, pain-related fear has a stronger mediating role in subjects over 55 years than in those under that age [31].

Pain catastrophizing is negative and distorted thinking and worrying about the pain and one's inability to cope [2]. Catastrophizing has also been shown to influence LBP-related disability in middle-aged patients [16–18,27–29,32–34], although not in the general population [35]. No previous study has explored its influence on LBP-related disability in the elderly, either with or without pain.

To date, studies performed to assess the influence of FAB on disability in Spanish elderly were conducted on subjects with a mean age of over 80 who lived in nursing homes and were in a poor general health condition [12,13]. That is a quite specific population, so factors influencing disability in community dwelling elderly may be different [36].

The current study was designed to assess the influence of FAB and catastrophizing on LBP-related disability in Spanish retired subjects living in the community.

Methods

This study was performed with all the subjects attending the conferences organized for retired persons in the island of Majorca, Spain, by the Institute for Social Affairs of the regional Government, between November 1, 2006 and March 30, 2007. All community dwelling residents in the island of Majorca who are retired from work or 65 years or older (even if they have never worked), are invited to attend such conferences at no cost. All attendees at those conferences were invited to participate voluntarily in this study.

Attending those conferences was the only inclusion criterion. Exclusion criteria were cognitive impairment, visual impairment, or functional illiteracy that prevented the completion of the questionnaires that were used to assess pain, disability, fear avoidance, and catastrophizing; being diagnosed as having inflammatory rheumatic disease, such as spondylitis or rheumatoid arthritis; and having fibromyalgia or a malignancy within the previous 5 years. The questionnaire given to the subjects listed those conditions, and subjects reporting having been diagnosed for any of them were told to stop filling it out. Exclusion criteria related to the impossibility of answering the questionnaires were assessed by the auxiliary personnel who collected them.

The study protocol was approved by the institutional review boards of the Kovacs Foundation and the Balearic Islands Regional Health Authority, and all subjects gave written informed consent for the use of their data.

On the day of entry in the study, subjects were asked to rate the severity of LBP and pain referred to LP, functional disability, FABs, and catastrophizing. Pain intensity of LBP and LP was measured with two separate 10-cm visual analog scales (VAS, for which 0 = no pain and 10 = worst possible pain) [37]. LBP-related disability, FAB, and catastrophizing were measured using the corresponding Spanish validated versions of the Roland-Morris questionnaire (RMQ), the FAB questionnaire (FABQ), and the catastrophizing subscale of the Coping Strategies Questionnaire (CSQ) [38–41]. None of those validated Spanish versions require for the subject to be in pain when answering them. Since no participant was

working, the subscale on FAB about work was excluded and only the subscale on FAB about physical activity (FAB-Phys) was used. Values for those questionnaires range, from better to worse, from 0 to 24 (RMQ and FAB-Phys), and from 0 to 36 (CSQ) [38–41].

Additionally, the following variables were recorded: Age (date of birth), sex, duration of the LBP episode, which was recorded in days and categorized as acute (<90 days) or chronic (≥ 90 days) [9,42,43], and presence of other chronic disabling conditions requiring constant medical treatment, such as Parkinson's disease, or cardiac or pulmonary insufficiency. The use of nonsteroidal anti-inflammatory agents, muscle relaxants, and analgesics for either LBP or any other disorders was also recorded. Due to the fluctuating course of low back pain, subjects reporting chronic LBP were classified as such even if they were pain free at the moment when they were answering the questionnaire.

All questionnaires were self-administered and completed by the subjects on their own, in the absence of health care staff or third parties. Completed self-report instruments were collected by auxiliary personnel not related to the study. Data were entered in a database at a coordination centralized office by two administrative assistants who double-checked that data entered coincided with ratings of the VAS, RMQ, FABQ, and CSQ by the subjects.

Analysis

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

Linear regression models were developed to estimate the association between FAB and disability, adjusting for other possible confounders [44]. Disability was the dependent variable and the maximal model included sex, age, chronicity (chronic/nonchronic), severity of LBP (VAS), severity of LP (VAS); values of FAB and catastrophizing, the interaction between FAB and chronicity; and the interaction between catastrophizing and chronicity.

In each case, the collinearity of the maximal model was evaluated using the criteria proposed by Belsley [45]. FAB and catastrophizing were forced into a nonautomatic backward elimination strategy oriented toward providing valid estimates, so that the variable with the highest *P* value that was not a confounder was excluded at each step [46].

Variables were considered to be confounders if the estimate of the coefficient of FAB or catastrophizing changed by more than 10% when that variable was removed from the maximal model. The normality of residuals was assessed graphically and through the Kolmogorov-Smirnov test [47].

It was hypothesized that if FAB or catastrophizing were to have an influence on LBP-related disability in Spanish elderly subjects, it might be greater in those actually suffering from clinically meaningful LBP, as opposed to those who were pain free. "Clinically meaningful LBP" was defined as pain ≥ 2 VAS points, based on the cut-off point for a clinically relevant change in LBP patients, which has shown to be between 1.5 and 2 points [48–50]. Therefore, analyses were repeated including only subjects reporting a low back pain severity ≥ 2 VAS points. Since it was anticipated that some retirees could be younger than 65 years, it was decided to repeat the analyses including only elderly subjects.

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

Results

A total of 1,413 subjects attended the conferences throughout the study period and were screened to be recruited. Those excluded had been diagnosed as having spondylitis (369), rheumatoid arthritis (280), rheumatic psoriasis (53), malignancy within the previous 5 years (76), fibromyalgia (16), or were suffering from visual impairment making it impossible for them to answer the questionnaires (29). Sixty subjects presented more than one exclusion criterion.

Among the 1,044 subjects who were included, the mean age was 72.3 and 143 (15.7%) were under 65 years of age. The mean age of those under 65 years was 60.5. Among the included subjects, 154 (14.8%) were males, 411 (39.4%) reported low back pain ≥ 2 VAS points, and 270 (34.1%) reported a history of chronic LBP. Table 1 shows other characteristics of the study subjects and Table 2 values for scores on the VAS, RMQ, SF-12, and FAB-Phys. Data are given as means (SD) except for those which did not show a normal distribution, for which medians (P25, P75) are shown.

The number of subjects who answered the questionnaires ranged between 857 (82.1%) for CSQ and 1,044 (100%) for RMQ. However, only 507 (48.6%) answered all of the questionnaires.

Table 1 Characteristics of study participants (N = 1,044)

Variables	Value					
	All participants (N = 1,044)		Subjects with current low back pain ≥ 2 VAS points (N = 411)		Subjects with current low back pain < 2 VAS points (N = 582)	
	N	Value	N	Value	N	Value
Age, years*	909	72.3 (7.5)	353	71.3 (7.6)	516	72.9 (7.4)
Sex, males†	1044	154 (14.8)	411	50 (12.2)	582	96 (16.5)
Chronic low back pain (≥ 3 months)†	792	270 (34.1)	204	193 (94.6)	582	71 (12.2)
Medication for low back pain†	974	261 (26.8)	392	195 (49.7)	540	51 (9.4)
Treatment for other illness†	974	652 (66.9)	388	287 (74.0)	544	333 (61.2)

* Data as mean (SD).

† Frequency (%).

VAS = visual analog scale.

Correlations between LBP, LP, disability, FAB, and catastrophizing are shown in Table 3. In Table 3A, data from all 1,044 participants are included. As seen in that table, LBP, LP, disability, FAB, and catastrophizing significantly correlated with each other, and the strongest observed correlation was between severity of LBP and disability ($r = 0.624$), while the weakest was between FAB and severity of LP ($r = 0.352$).

In Table 3B, only data from the 411 participants with LBP ≥ 2 VAS points are included. As seen in that table, in this subset of subjects there was a weak correlation between severity of LBP and disability ($r = 0.366$). The strongest observed correlation was between RMQ and CSQ ($r = 0.468$), and the weakest between FAB and severity of LP ($r = 0.152$).

In Table 3C, only data from the 582 participants with no clinically relevant LBP are included. As seen in that table, the strongest observed correlations were between FAB and CSQ ($r = 0.535$) and between RMQ and FAB ($r = 0.390$), and there were no significant correlations between CSQ and severity of LBP, and between CSQ or LBP with RMQ.

FABQ, CSQ, and age had to be centered because of collinearity problems in the regression models. Table 4 shows crude and adjusted analyses of the effect of FAB and catastrophizing on disability. As seen in that table, there was no interaction between chronicity and FAB or catastrophizing in any model. In the analysis in which the 507 subjects who had answered all of the questionnaires were included, both FAB and catastrophizing were associated with disability after adjusting for confounders, although each additional point in the FABQ and CSQ was associated with an increase of only 0.17 and 0.18 points in the RMQ, respectively (Table 4A). Among those 507 subjects, each additional point on the FABQ and CSQ was associated with an increase of 0.28 and 0.19 points in the RMQ, respectively; in the 103 subjects reporting LBP ≥ 2 VAS points (Table 4B), and of 0.14 and 0.17 in the 403 subjects reporting LBP < 2 VAS points (Table 4C). Due to the different value range of those questionnaires, Tables 4A, 4B, and 4C also show the standardized coefficients. Results remained unchanged when data from the 143 subjects who were under 65 years of age were excluded from the analyses (data not shown).

Table 2 Pain, disability, fear avoidance beliefs, and catastrophizing in study participants

Variables	Value					
	All participants (N = 1,044)		Subjects with current low back pain ≥ 2 VAS points (N = 411)		Subjects with current low back pain < 2 VAS points (N = 582)	
	N	Value	N	Value	N	Value
Intensity of low back pain, VAS*	993	0.0 (0.0–5.0)	411	5.0 (4.0–7.0)	582	0.0 (0.0–0.0)
Intensity of leg pain, VAS*	958	0.0 (0.0–0.0)	365	0.0 (0.0–5.0)	564	0.0 (0.0–0.0)
Disability, RMQ*	1044	1.0 (0.0–6.0)	411	6.0 (2.0–11.0)	582	0.0 (0.0–1.0)
FAB*	864	4.5 (0.0–18.0)	300	16.0 (7.2–22.0)	494	0.0 (0.0–9.0)
CSQ*	857	0.0 (0.0–6.0)	306	6.0 (1.0–15.0)	521	0.0 (0.0–1.0)

* Data as median (P25, P75).

FAB = FAB-Phys subscale; VAS = visual analog scale; RMQ = Roland Morris Questionnaire.

Table 3A Spearman correlation coefficients between pain, disability, fear avoidance beliefs and catastrophizing: Data from all 1,044 participants

	Low Back Pain, VAS	Leg Pain, VAS	Disability (RM)	CSQ
FAB	0.517	0.352	0.587	0.616
<i>P</i>	<0.001	<0.001	<0.001	<0.001
<i>N</i>	794	762	824	752
Low back pain, VAS		0.532	0.624	0.542
<i>P</i>		<0.001	<0.001	<0.001
<i>N</i>		929	993	827
Referred pain, VAS			0.387	0.361
<i>P</i>			<0.001	<0.001
<i>N</i>			958	794
Disability (RM)				0.590
<i>P</i>				<0.001
<i>N</i>				857

FAB = FAB-Phys subscale; VAS = visual analog scale; RM = Roland Morris Questionnaire; CSQ = Coping Strategies Questionnaire.

Table 3B Spearman correlation coefficients between pain, disability, fear avoidance beliefs and catastrophizing: Data from 411 Participants with current low back pain ≥ 2 VAS points

	Low Back Pain, VAS	Leg pain, VAS	Disability (RM)	CSQ
FAB	0.082	0.152	0.408	0.418
<i>P</i>	0.154	0.013	<0.001	<0.001
<i>N</i>	300	267	300	264
Low Back Pain, VAS		0.342	0.366	0.295
<i>P</i>		<0.001	<0.001	<0.001
<i>N</i>		365	411	306
Referred Pain, VAS			0.260	0.242
<i>P</i>			<0.001	<0.001
<i>N</i>			365	271
Disability (RM)				0.468
<i>P</i>				<0.001
<i>N</i>				306

FAB = FAB-Phys subscale; VAS = visual analog scale; RM = Roland Morris Questionnaire; CSQ = Coping Strategies Questionnaire.

Table 3C Spearman correlation coefficients between pain, disability, fear avoidance beliefs and catastrophizing: Data from 582 Participants with current low back pain < 2 VAS points

	Low Back Pain, VAS	Leg pain, VAS	Disability (RM)	CSQ
FAB	0.197	0.119	0.390	0.535
<i>P</i>	0.000	0.009	0.000	0.000
<i>N</i>	494	478	494	463
Low back pain, VAS		0.236	0.087	0.035
<i>P</i>		0.000	0.036	0.425
<i>N</i>		564	582	521
Referred pain, VAS			0.076	-0.052
<i>P</i>			0.071	0.246
<i>N</i>			564	508
Disability (RM)				0.367
<i>P</i>				0.000
<i>N</i>				521

FAB = FAB-Phys subscale; VAS = visual analog scale; RM = Roland Morris Questionnaire; CSQ = Coping Strategies Questionnaire.

Discussion

These results show that the influence of FAB and catastrophizing on disability is small in community dwelling Spanish retirees. As seen in Table 3, although statistically significant, there are only moderate correlations between disability and pain (either low back pain or referred pain) with fear avoidance beliefs or catastrophizing. In the subset of subjects with current LBP, those correlations are even weaker and there is no correlation between FAB and LBP (Table 3). Linear regression models show that subjects with the highest possible score in CSQ would have a 6.5-RMQ point increase in disability, which would be 6.8 for those currently having back pain. Corresponding values for subjects with the highest possible score in FAB would be 4.1 RMQ points, or 6.7 for those currently having back pain (Table 4). Taking into account that the highest possible score for disability is 24-RMQ points, that scores below 4 points are seen as irrelevant, and that changes below 3 points are clinically irrelevant [48–52], those values reflect a small influence.

The prevalence of a history of inflammatory diseases and malignancy among the 1,413 subjects who were screened for this study was high (23.6% and 5.4%, respectively). This is likely to be due to the age of the sample and to its being composed of retirees, since those conditions may lead to premature retirement. Since those subjects were excluded from the analysis, they do not affect the validity of these results for both the general retired population and the subset suffering from LBP.

All retirees are invited to attend the conferences at which subjects were recruited for this study. Those conferences focus on all kinds of cultural, historic, artistic, and scientific topics, including health-related issues. They are free and very popular among the elderly, irrespective of their social and cultural level. However, it is likely that subjects with the most serious physical or psychological diseases attend those conferences to a lesser extent than those who are in a better health condition, and this may limit generalizability of conclusions from this study to that subset of subjects. Although it is not likely for LBP-related disability to be a major concern in subjects with more serious or life-threatening diseases, patients with intense acute exacerbations of LBP might have been unable to attend the conference, and therefore, would not have been recruited for this study. As this study focuses on community dwelling older persons and not on patients seeking care, subjects

Table 4A Effect of fear avoidance beliefs and catastrophizing on disability: Data from participants with all the variables filled out (N = 507)

All Subjects	Crude Analysis			Adjusted Analysis		
	Coefficient (95% CI)	Standard Coefficient	P	Coefficient (95% CI)	Standard Coefficient	P
FAB	0.32 (0.28, 0.35)	0.64	<0.001	0.17 (0.14, 0.20)*	0.34*	<0.001*
CSQ	0.43 (0.38, 0.48)	0.60	<0.001	0.18 (0.14, 0.23)†	0.25†	<0.001†

* Adjusted for catastrophizing and low back pain severity (VAS score).

† Adjusted for fear avoidance beliefs and low back pain severity (VAS score).

FAB = FAB-Phys subscale; VAS = visual analog scale; CSQ = Coping Strategies Questionnaire.

Table 4B Effect of fear avoidance beliefs and catastrophizing on disability: Data from participants with all the variables filled out and LBP severity ≥ 2 VAS points (N = 103)

Only LBP Subjects (VAS ≥ 2)	Crude Analysis			Adjusted Analysis		
	Coefficient (95% CI)	Standard Coefficient	P	Coefficient (95% CI)	Standard Coefficient	P
FAB	0.37 (0.27, 0.48)	0.58	<0.001	0.28 (0.18, 0.38)*	0.44*	<0.001*
CSQ	0.35 (0.24, 0.45)	0.54	<0.001	0.19 (0.09, 0.30)†	0.30†	<0.001†

* Adjusted for catastrophizing.

† Adjusted for fear avoidance beliefs and low back pain severity (VAS score).

FAB = FAB-Phys subscale; VAS = visual analog scale; CSQ = Coping Strategies Questionnaire; LBP = low back pain.

Table 4C Effect of fear avoidance beliefs and catastrophizing on disability: Data from participants with all the variables filled out and LBP severity < 2 VAS points (N = 403)

Only not LBP Subjects (VAS <2)	Crude Analysis			Adjusted Analysis		
	Coefficient (95% CI)	Standard Coefficient	P	Coefficient (95% CI)	Standard Coefficient	P
FAB	0.17 (0.14, 0.20)	0.48	<0.001	0.14 (0.11, 0.17)*	0.38*	<0.001*
CSQ	0.25 (0.19, 0.30)	0.41	<0.001	0.17 (0.11, 0.22)†	0.28†	<0.001†

* Adjusted for catastrophizing.

† Adjusted for fear avoidance beliefs.

FAB = FAB-Phys subscale; VAS = visual analog scale; CSQ = Coping Strategies Questionnaire.

were recruited from the community. Therefore, the potential absence of elderly patients with serious conditions does not compromise the validity or generalizability of results from this study to that target population.

All the 1,413 subjects attending the conferences were screened for inclusion in the study. Among them, 369 (26.1%) showed at least one exclusion criterion, and the other 1,044 subjects were included. Because of Spanish laws on privacy and data protection, the Ethical Committee reviewing this study requested that the authors gather data only from the included subjects. Therefore, subjects reporting exclusion criteria were not asked to further answer the questionnaire and no further data on them are available. Since 26.1% of the screened subjects did not qualify for inclusion in this study, this can raise the question of how representative this sample is of all Spanish retirees. However, since all the subjects complying with

inclusion criteria were included in the study, it does not question the representativeness of the sample in relation to the target population.

Women attend the conferences—in which the sample for this study was recruited—to a greater extent than men. As a result, approximately 85% of participants in this study were females and sample size does not allow for valid comparison of results between genders (Table 1). Therefore, although these results are generally consistent with those from previous studies in which the sample was more balanced across genders [13], further studies should explore the validity of current results among noninstitutionalized older men.

Previous studies have focused on the influence of psychological variables on LBP-related variables in LBP patients (defined as those seeking care for their condition). Their results show that such influence varies across cultural environments,

and those from Spanish patients are generally consistent with those from the current study. FAB are the most important determinant of disability in Northern European and Anglo-Saxon patients [15–25], but they are irrelevant in the Spanish cultural environment [12–14]. The influence of age on the relationship between FAB and disability also varies across cultural settings. In Spanish subjects of working age FAB explain less than 6% of disability [12], they have an even weaker influence on community dwelling retirees with a mean age around 70 (Table 4), and they explain nothing in institutionalized elderly subjects over 80 [13,14]. On the contrary, in the United States, the older the subjects the higher is the influence of FAB [31]. It would be interesting to explore the influence of FAB in United States elderly from a Spanish cultural background.

Since RMQ and FABQ have been developed to assess disability and FAB related to LBP, the appropriateness of including subjects with no currently relevant LBP should be discussed. At the design phase, it was decided to include subjects both with and without clinically relevant LBP because of the following reasons: 1) In theory, catastrophizing and FAB reflect psychological factors that are independent of the patient's current pain status; 2) catastrophizing and FAB have been shown to influence LBP-related disability independently from pain [8,9,15–31], and to exert their influence even when the subject is pain-free [13,16]; 3) that effect may be especially important for subjects having already experienced LBP, in which psychological factors may continue to influence disability even after the disappearance of pain [16], and lifetime prevalence of LBP makes it an almost universal experience among the elderly [1,2]; 4) a previous study in Spain showed that low back pain has a point prevalence of 62% in those older than 65 [36]; 5) because of the way RMQ and FAB are phrased, they do not require the subject to be currently in pain when answering them—in fact, statements in both the Spanish and original English versions of those questionnaires explore limitations or beliefs related to “low back pain”, which although they include “back pain that is currently felt” do not necessarily imply it [15,38,39,53]; 6) a previous study conducted with Spanish-institutionalized elderly using those questionnaires showed FAB to correlate with disability more strongly in those who were pain free than in those with current LBP [13]; and 7) including both kinds of subjects was the only way to compare the influence of catastrophizing and FAB between

those with and without current pain in non-institutionalized elderly. Therefore, it was decided to analyze results separately in those subsets (Tables 3 and 4). In fact, it is worth noting that correlations among FAB, CSQ, and RMQ are similar between those subjects with and without current clinically relevant LBP, the correlation between FAB and LBP is only significant in subjects with no pain (Tables 3B and 3C), and only the influence of FAB on disability is higher in subjects with current pain than in those who are pain free (Tables 4B and C). This might be interpreted as suggesting that, as was to be theoretically expected, psychological factors influencing LBP-related disability, and especially catastrophizing, exert their influence independently of the patient's current pain status.

In the Northern European environment, catastrophizing has also been shown to influence LBP-related disability in LBP patients [33,34], but not in the general population [35]. In this study, it has shown to have a negligible influence on noninstitutionalized Spanish retirees, either suffering from LBP or not. This may be due to the influence of catastrophizing on disability in Spanish subjects being as irrelevant as FAB have shown to be, to its being irrelevant in samples from the general population, either with or without pain (as opposed to samples recruited from the clinical setting), and/or to its being irrelevant in elderly subjects. Since the influence of FAB and catastrophizing on disability in the elderly has only been assessed in Spanish subjects [13], it is currently unknown what that influence is in elderly subjects or patients from other cultural environments. That should be explored in further studies.

In Spain, premature retirement (i.e., before 65) may be due to work-related issues (essentially based on political decisions for reconversions affecting mainly the public economic sector, civil servants, or very large private companies) or medically related reasons, with the latter being the most common. In this study, elderly persons (i.e., over 65) represent the vast majority (84.3%) of the retirees who were included in the sample. The mean age of premature retirees who were included in this study was 60.5 years, and results did not change when they were excluded from the analysis. Therefore, it may be interpreted that results from this study are valid for community dwelling Spanish retirees, including the elderly.

Previous studies that have shown the irrelevance of the influence of FAB on disability in Spanish subjects have been conducted with

samples recruited in Northwestern Spain [13,14], or in representative samples of Spanish LBP patients recruited throughout the country [12]. The current study was conducted in Mallorca, a Spanish island in the Mediterranean. There is no reason to doubt that the study sample is representative of Spanish noninstitutionalized retirees, and results from this and previous studies in Spanish subjects are consistent. That suggests that generalizability of the current results to other community dwelling Spanish retirees do not seem a major issue. Further studies should explore the generalizability of these findings to other countries.

In this study, only the RMQ was answered by all of the 1,044 study subjects, and only 507 (48.6%) answered all of the questionnaires and could be included in the regression models (Table 2). Therefore, the representativity of subjects whose data were entered in the regression models should be discussed. It should be noted that no questionnaire was answered by less than 82% of the subjects, and only CSQ and FABQ were answered by less than 90% (Table 2). In fact, although the questionnaire that was not answered varied across subjects, more than 80% of them left only one questionnaire unanswered. Several reasons may account for that: This study including five questionnaires (two separate VAS, the RMQ, FABQ, and CSQ), the study subjects being elderly with a mean age of over 70 years, and their being recruited from the general elderly population rather than from the clinical environment. In addition, the questionnaires used in this study were given to the subjects as a single document, and the two questionnaires that were left unanswered by most subjects were the two last ones to appear in that document—CSQ (17.9% of missing values) and FABQ (17.2%). The same holds true for the single questions, with the last ones on the questionnaire (i.e., chronicity status) having more missing values than the rest. There were no differences in any of the variables answered by those subjects with missing values (data not shown). All of this suggests that the main reason for missing values in this study is that too many questionnaires were used (taking into account the characteristics of the study population).

In addition, the relative ease for filling out the questionnaires and the feeling elicited by the statements that each one includes might also play a role in the rate of missing values for each questionnaire. In this respect, it should be noted that, as found in this study, previous studies with the Spanish version of the RMQ have shown that it is

the easiest questionnaire to fill out, and the one leading to the least number of missing values, when compared to the Oswestry Disability Index or even VAS [8,37]. On the other hand, CSQ and FABQ are also the most “pessimistic” and possibly the most unexpected for participants in a study on LBP, especially since the variables they measure have not proved to be relevant in Spanish subjects or LBP patients [12–14]. This might be interpreted as suggesting that subjects answering those questionnaires were those more prone to accept the statements in them. Should that be the case, results from this study would overestimate the actual effect of catastrophizing and FAB on disability.

Identifying the determinants of disability in elderly subjects is important in order to improve it. In a previous cluster randomized controlled trial, a short education program aiming at promoting activity and decreasing FAB proved to be effective for improving LBP-related disability in Spanish elderly [14]. However, that effect was due to the direct promotion of activity, and the improvement of FAB did not influence it [14]. Results from that trial and from this study question the efficiency of focusing on psychological factors when aiming at improving disability in Spanish elderly.

In conclusion, these results show that in Spanish community dwelling retirees, including the elderly, the influence of FAB and catastrophizing on LBP-related disability is statistically significant but small.

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