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Psychological and culturally-influenced risk factors for the incidence and persistence of low back pain and associated disability in Spanish workers: findings from the CUPID study

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Abstract

Objective—To assess the importance of psychological and culturally-influenced factors as predictors of incidence and persistence of LBP in a Spanish working population.

Methods—As part of the international CUPID study, 1105 Spanish nurses and office workers, aged 20-59 years, answered questions at baseline about LBP in the past month and past year, associated disability, occupational lifting, smoking habits, health beliefs, mental health, and distress from common somatic symptoms. At follow-up 12 months later, they were asked again about LBP and associated disability in the past month. Associations with the incidence and persistence of LBP were assessed by log binomial regression, and characterised by prevalence rate ratios (PRRs) with associated 95% confidence intervals (CIs).

Results—971 participants (87.9%) completed follow-up. Among 579 with no LBP at baseline, 22.8% reported LBP at follow-up. After adjustment for sex, age and occupation, development of new LBP was predicted by poor mental health (PRR 1.5, 95%CI 1.0-2.2), somatising tendency (PRR 1.8, 95%CI 1.2-2.7), and presence of LBP for >1 month in the year before baseline (PRR 4.7, 95%CI 3.1-6.9). Among 392 subjects who had LBP at baseline, 59.4% reported persistence at follow-up. Persistence of LBP was associated with presence of symptoms for >1 month in the 12 months before baseline (PRR 1.4, 95%CI 1.2-1.7), and more weakly with somatising tendency, and with adverse beliefs about the work-relatedness and prognosis of LBP

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Conclusion—In Spain, as in northern European countries, psychological and culturally-influenced factors have an important role in the development and persistence of LBP.

Keywords

low back pain; health beliefs; mental health; somatising tendency

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INTRODUCTION

Low back pain (LBP) is a major cause of incapacity for work in industrialised countries with substantial economic impact.[1,2] In Spain it has been estimated that the annual cost of workers' compensation for LBP during 1993-97 was 11 billion pesetas (approximately €67 million).[3]

In western countries, 60-80% of people experience LBP at some point in their lives, and the symptom is often persistent or recurrent.[4] Thus, past history of LBP has been found to predict its future occurrence.[5,6] In addition, LBP has been linked with occupational activities that stress the spine, in particular heavy lifting, bending and twisting,[7] and with psychological risk factors such as low mood, somatising tendency and adverse health beliefs.[8,9]

It is possible that people with low mood, tendency to somatise, and a belief that back pain commonly arises from injury to spinal tissues and often has a poor prognosis, are prone to dwell on back pain that others would dismiss. This on its own could cause the pain to persist and become more troublesome. In addition, they may be more inclined to modify their posture or activities to protect the back and reduce their pain, with adverse consequences for its resolution. Randomised controlled trials have shown that LBP resolves faster with continued activity rather than rest,[10] and in Victoria, Australia, a media campaign with the message that back pain normally resolves quickly, and encouraging people with the symptom to remain active, was followed by a reduction in back-related disability for work.[11] However, much of the evidence for a role of psychological factors comes from cross-sectional surveys, making it difficult to discern cause from effect. For example, while low mood may predispose to LBP, it is also reasonable to expect that LBP would lower mood.

Furthermore, most studies to date have been conducted in northern Europe, and few data are available on the impact of psychological risk factors for LBP in southern European countries such as Spain. Two different theoretical models have been proposed.[12] The "social pathway model" postulates that avoidance behaviours are influenced by a combination of a macrosystem of health beliefs and health culture with a microsystem of personal health beliefs, while another (the "depression pathway model") postulates that a minority of patients with LBP have coexisting low mood, not necessarily as a response to pain, and that this state can by itself lead to poor pain recovery.[12] Based on these theoretical models, even in pain-free individuals, health beliefs, and possibly also tendency to somatise, could be importantly influenced by beliefs and behaviours that are prevalent in the society in which an individual lives. Moreover, personality traits and learned behaviours could be activated and enhanced in a reciprocal process with the pain experience.[13] If this is true, their nature and consequences could differ substantially between countries with different cultural attitudes to illness. Three earlier studies have suggested that, unlike in northern Europe, adverse fear avoidance beliefs have little influence on disability from LBP among primary care LBP patients and elderly Spanish people. [14-16]

The international CUPID (Cultural and Psychosocial Influences in Disability) study was established principally to investigate the influence of culturally-determined health beliefs

and expectations on the occurrence of musculoskeletal symptoms and associated disability. To explore the role of mental health, somatising tendency and health beliefs as risk factors for the incidence and persistence of back symptoms and associated disability in a Spanish working population, we analysed longitudinal data on nurses and office workers that were collected as part of the CUPID study.

METHODS

Data collection was carried out between November 2007 and February 2010 at four hospitals and a university in Barcelona. Prior approval was obtained from the Parc Salut Mar Ethics Committee of Barcelona and the Health and Safety Committee of each participating centre.

From employment records, we identified all permanently employed nursing staff (excluding those from out-patient clinics and paediatric wards) and office workers aged 20-59 years, who had been in their current job for at least 12 months. At each centre, a trained member of the staff contacted these individuals to explain the study and invite them to take part. Those who agreed were then interviewed at their place of work by a member of the research team, who administered a computer-assisted baseline questionnaire.

Among other things, the questionnaire asked about sex, age, smoking habits, occupational lifting, health beliefs about LBP, mental health, somatising tendency, history of LBP in the past 12 months, and associated disability. Subjects were classed as exposed to occupational lifting if they reported that an average working day entailed lifting weights >25Kg by hand. Questions about health beliefs were adapted from the Fear-Avoidance Beliefs Questionnaire, [17] and were grouped in three domains. Participants were considered to have adverse beliefs about physical activity if they completely agreed or tended to agree both that for someone with LBP, physical activity should be avoided as it might harm the back, and also that rest was needed to get better. They were deemed to have adverse beliefs about work-relatedness if they completely agreed or tended to agree that LBP was commonly caused by people's work. And they were classed as having adverse beliefs about prognosis if they both completely agreed or tended to agree that neglecting problems such as LBP can cause permanent health problems, and also completely disagreed or tended to disagree that LBP usually gets better within three months. Mental health was assessed through the relevant section of the SF-36 questionnaire,[18] and scores were grouped in approximate thirds of the overall distribution (good, intermediate, poor). Somatising tendency was assessed using elements of the Brief Symptom Inventory (BSI),[19] and subjects were classified according to the number of common somatic symptoms from a total of five (faintness or dizziness, pains in the heart or chest, nausea or upset stomach, difficulty breathing, and hot or cold spells) that had been at least moderately distressing during the past week.

LBP was ascertained through a question which asked whether, during the past 12 months, pain had been present for a day or longer in an anatomical area between the twelfth ribs and the gluteal folds, which was depicted in a diagram. Those who answered yes were asked whether the pain had been present for more than four weeks in total, whether it had been present in the past month, and whether during the past month it had made it difficult or impossible to cut toe nails, get dressed or do normal jobs around the house. Pain in the past month was classed as disabling if it had rendered any of these activities difficult or impossible.

Participants who consented at baseline were subsequently re-interviewed after an interval of 12 months, using a follow-up questionnaire, which again asked about LBP and associated disability in the past month.

Both the baseline and follow-up questionnaires were originally drafted in English, translated into Spanish, and then independently back-translated to English. Where the back-translation revealed misinterpretation, the translated questionnaire was modified appropriately. In addition, before the data collection began, the baseline interviews were piloted in a sample of 30 nurses to check that questions were clearly understood.

Statistical analysis was carried out with Stata Version 11 software.[20] Log-binomial regression was used to explore risk factors for: (i) the presence of LBP in the past month at follow-up among subjects who had been free from LBP in the past month at baseline (development of new LBP); (ii) the presence of disabling LBP in the past month at follow-up among subjects who had been free from LBP in the past month at baseline (development of new disabling LBP); (iii) the presence of LBP in the past month at follow-up among subjects who had LBP in the past month at baseline (persistence of LBP); and (iv) the presence of disabling LBP in the past month at follow-up among subjects who had disabling LBP in the past month at baseline (persistence of disabling LBP). Associations were adjusted for potential confounding variables, and summarised by prevalence rate ratios (PRRs) and associated 95% confidence intervals (95% CIs).

RESULTS

Among 1199 potentially eligible subjects who were invited to take part in the study, 1158 (96.6%) agreed. However, 53 were subsequently excluded because they were found not to meet all of the inclusion criteria. Thus, the baseline study sample comprised 1105 participants, of whom 667 were nurses and 438 office workers. Usable follow-up information was obtained for 971 (87.9%) of these subjects (578 nurses and 393 office workers). Response rates at follow-up were slightly lower in the youngest subjects (81.7% at ages 20-29 years), but otherwise differed little in relation to the baseline risk factors of interest (Table 1).

Among the 971 subjects who completed follow-up, 579 (59.6%) had been free from LBP in the past month at baseline, and of these, 132 (22.8%) reported LBP, and 41 (7.1%) disabling LBP when re-interviewed after 12 months. Table 2 shows associations of new LBP and new disabling LBP with various risk factors assessed at baseline. After adjustment for sex, age and occupation, development of new LBP was more common in those participants with poor mental health (PRR 1.5, 95%CI 1.0-2.2, in comparison with good mental health) and multiple distressing somatic symptoms (PRR 1.8, 95%CI 1.2-2.7), but the strongest predictor of new LBP was earlier history of the symptom, especially if it had been present for >1 month in the 12 months before baseline (PRR in comparison with no LBP in the past 12 months 4.7, 95%CI 3.1-6.9). In contrast, no association was apparent with occupational lifting, although there was a higher risk in nurses as compared with office workers (PRR 1.3, 95%CI 1.0-1.8). When risk estimates were mutually adjusted as well as being adjusted for sex, age and occupation, they shifted somewhat towards the null, but those for past history of LBP remained highly significant.

For new disabling LBP, past history of LBP, poor mental health and somatising tendency were again significant predictors, as were adverse beliefs about the work-relatedness of LBP (PRR 3.3, 95%CI 1.2-9.2), and being a former smoker (PRR in comparison with never smokers 2.9, 95%CI 1.5-5.8), but not a current smoker (PRR 0.9). However, occupational lifting was not associated with increased risk. When risk estimates were mutually adjusted, only those for adverse beliefs about work-relatedness, former smokers and past history of LBP remained statistically significant.

The subjects who completed follow-up also included 392 who had reported pain in the past month at baseline. Of these, 233 (59.4%) still had LBP at follow-up. After adjustment for sex, age and occupation, persistence of LBP was more frequent in those with LBP for >1 month in the 12 months before baseline (PRR 1.4, 95%CI 1.2-1.7), and was weakly associated with somatising tendency (PRR 1.3, 95%CI 1.0-1.5 for those with multiple as compared with no distressing somatic symptoms) and adverse beliefs about work-relatedness (PRR 1.2, 95%CI 1.0-1.5) and prognosis (PRR 1.2, 95%CI 1.1-1.4) of LBP (Table 3). Mutually adjusted risk estimates were generally slightly lower.

Among 191 subjects with disabling LBP in the past month at baseline, 77 (40.3%) still had disabling LBP in the past month at follow-up. Persistence of disabling LBP was more common in those with LBP for >1 month in the 12 months before baseline (PRR 1.6, 95%CI 1.1-2.4), and with poor mental health (PRR 1.7, 95%CI 1.1-2.7, in comparison with good mental health) (Table 4). Mutual adjustment had minimal impact on these risk estimates.

DISCUSSION

In this longitudinal survey of Spanish workers, low mood and somatising tendency were significantly associated with the subsequent incidence of LBP and disabling LBP, and low mood predicted the persistence of disabling LBP. There were also indications that adverse beliefs about the work-relatedness of LBP carried an increased risk of new disabling LBP.

As far as we know, this is the first study of its sort among people of working age in Spain. As well as its longitudinal design, it had the strength of being based on a substantial sample of subjects, with high response rates both at baseline and at follow-up. In particular, the items on mental health and somatising tendency were taken from validated instruments[18,19], and have previously demonstrated predictive validity for the incidence and persistence of musculoskeletal symptoms. Similarly, the questions on fear avoidance beliefs were based on a validated questionnaire[17] and have shown predictive validity in a longitudinal study. There is no reliable standard against which to assess the accuracy with which subjective symptoms such as pain are reported, but the questions about pain and disability had again been used successfully in earlier studies. Moreover, the style of our questions about symptoms was similar to that of the Nordic questionnaire,[21] which has been shown to have acceptable reliability.[22]

Against this, our measure of occupational lifting was fairly crude (for example, there was no attempt to assess the frequency of lifting tasks), and there was only limited heterogeneity of the exposure within each of the two occupational groups studied (which had been chosen with the intention that their exposure to physical risk factors should be fairly uniform). This limitation may explain why, after adjustment for occupation, we failed to find associations of lifting with either the incidence or persistence of LBP despite strong evidence from other studies that it is an important risk factor for low back disorders.[7]

Because it was possible that risk factors for incidence of LBP differ from those for persistence of pain that is already present, we looked separately at associations with new LBP among those who had been free from the symptom at baseline for at least one month, and with the continuing presence of LBP in those who had experienced it in the month before baseline. If anything, low mood and somatising tendency tended to be more strongly associated with incidence than persistence of pain. However, the PRRs for persistence were constrained by the high overall frequency (59.4%) of this outcome (if the prevalence in those unexposed to a risk factor is x%, the maximum possible PRR in the exposed is 100/x). Also, our definition of freedom from LBP at baseline was somewhat arbitrary. Nevertheless,

we found no indication that low mood and somatising tendency were predictors only of pain persistence.

Our finding that incidence and persistence of LBP were predicted by low mood and tendency to somatise accords with results from longitudinal studies in other countries.[8,9] Furthermore, although associations with these psychological risk factors were reduced after adjustment for past history of LBP, this does not necessarily argue against their having a causal role. If they are persistent characteristics, they may also have contributed to the earlier occurrence of back symptoms.

A relation between past history of LBP and incidence of new symptoms was expected, given the findings from other studies,[5,6] although a recent systematic review concluded that previous LBP episodes were not a useful predictor of outcome in patients with new onset of LBP.[23] One explanation for the association with incident LBP might be that pain arises from structural abnormalities in the spine which persist even when the symptom resolves, and then lead to further episodes. However, demonstrable spinal pathologies such as herniated inter-vertebral disc, nerve root compression, disc degeneration and annular tear, appear to account for only a minority of cases of LBP.[24] Another possible explanation is continuing exposure to important risk factors for LBP, either physical or psychological, although in our analysis, the associations with past history of LBP were little reduced by adjustment for the other risk factors analysed. It could also be that some individuals have a persistently heightened awareness of back symptoms and lower threshold for resultant disability.

It has been postulated that LBP and associated disability may also be importantly influenced by culturally determined health beliefs and expectations, and that this might explain striking temporal changes that have occurred in Britain over the past 60 years in rates of incapacity for work attributed to back disorders.[25] In this study, we found some indications that the development of disabling LBP was associated with beliefs about its relation to work, and others have observed that fear-avoidance beliefs were associated both with new onset of LBP,[26] and also with worse prognosis in patients with established LBP.[23,27] Three earlier studies carried out in Spanish populations suggested that the influence of fear-avoidance beliefs on LBP and associated disability was relatively small.[14-16] However, these were cross-sectional and restricted to LBP patients and older subjects.

In addition to associations with psychological risk factors and past history of LBP, we also found an increased risk of new disabling pain among former smokers (Table 2). However, the absence of any increased risk among current smokers suggests that this was a chance observation.

In summary, our findings indicate that despite possible cultural differences, and contrary to indications from earlier studies in older populations, among people of working age in Spain, as in northern European countries, psychological factors have an important role in the development and persistence of LBP. It follows that in Spain, as elsewhere, interventions to prevent back disorders in the workplace should not necessarily be limited to the control of physical risk factors. Job modification and ergonomic improvements may enable people with LBP to remain at work or to return to work earlier than they would otherwise have done. However, randomised controlled trials of ergonomic interventions for the prevention of LBP have tended to demonstrate an absence of benefit.[28] This suggests that there is a case for a more holistic approach to prevention.

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WHAT THIS PAPER ADDS

- Studies carried out mainly in northern Europe have linked low back pain and associated disability with psychological risk factors such as low mood, somatising tendency and adverse health beliefs.
- However, health beliefs, and perhaps somatising tendency, are likely to be influenced by cultural environment, and three previous studies have suggested that in Spain, adverse fear avoidance beliefs have little influence on disability from back pain.
- This longitudinal study of Spanish nurses and office workers found that despite possible cultural differences from other countries, poor mental health and somatising tendency predicted subsequent incidence of low back pain and associated disability.
- Incidence of disabling low back pain was also predicted by adverse beliefs about work as a cause of back pain, and somatising tendency was also a risk factor for persistence of low back pain.
- In Spain as elsewhere, interventions to prevent back disorders in the workplace should not necessarily be limited to the control of physical risk factors.

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Table 1
Characteristics of participants at baseline and response rates at follow-up

Characteristic	Number who completed baseline questionnaire	Number who completed follow-up	Response rate (%)
Sex			
Male	136	124	91.2
Female	969	847	87.4
Age (years)			
20-29	240	196	81.7
30-39	360	318	88.3
40-49	348	315	90.5
50-59	157	142	90.4
Occupation			
Nurse	667	578	86.7
Office worker	438	393	89.7
Occupational Lifting			
No	548	488	89.1
Yes	557	483	86.7
Smoking			
Never	491	434	88.4
Former smoker	216	193	89.4
Current smoker	398	344	86.4
Adverse beliefs about LBP			
Physical activity	450	385	85.6
Work-relatedness	864	750	86.8
Prognosis	487	419	86.0
Mental Health			
Good	370	323	87.3
Intermediate	356	314	88.2
Poor	379	334	88.1
Number of distressing somatic symptoms in past week			
0	632	556	88.0
1	294	264	89.8
≥2	179	151	84.4
LBP in past 12 months			
No	402	359	89.3
≤1 month in total	446	395	88.6
>1 month in total	257	217	84.4
LBP in past month			
No	645	579	89.8
Yes	460	392	85.2

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Characteristic	Number who completed baseline questionnaire	Number who completed follow-up	Response rate (%)
All subjects	1105	971	87.9

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Table 2

Baseline predictors of new low back pain and new disabling low back pain

Analysis was restricted to the 579 subjects with no LBP in the past month at baseline

Predictor	New low back pain						New disabling low back pain					
	n[a]	%[b]	PRR	(95% CI)[c]	PRR	(95% CI)[d]	n[a]	%[b]	PRR	(95% CI)[c]	PRR	(95% CI)[d]
Occupation												
Office workers	51	19.0	1.0		1.0		20	7.5	1.0		1.0	
Nurses	81	26.1	1.3	(1.0-1.8)	1.3	(0.8-1.9)	21	6.8	0.9	(0.5-1.6)	0.9	(0.3-2.4)
Occupational lifting [e]	64	25.8	0.9	(0.6-1.4)	1.0	(0.7-1.4)	17	6.9	1.0	(0.4-2.9)	1.0	(0.4-2.6)
Adverse beliefs about LBP												
Physical activity	51	22.6	1.0	(0.7-1.3)	0.9	(0.7-1.2)	11	4.9	0.6	(0.3-1.1)	0.6	(0.3-1.1)
Work relatedness	106	24.5	1.3	(0.8-1.9)	1.1	(0.8-1.6)	37	8.6	3.3	(1.2-9.2)	3.5	(1.2-9.7)
Prognosis	52	23.5	1.0	(0.7-1.3)	0.8	(0.6-1.1)	19	8.6	1.4	(0.8-2.5)	1.4	(0.7-2.5)
Mental health												
Good	38	16.8	1		1		10	4.4	1		1	
Intermediate	53	27.8	1.7	(1.2-2.4)	1.4	(1.0-2.0)	14	7.3	1.6	(0.7-3.6)	1.4	(0.7-3.0)
Poor	41	25.3	1.5	(1.0-2.2)	1.2	(0.8-1.7)	17	10.5	2.4	(1.1-5.0)	1.9	(0.9-4.0)
Number of distressing somatic symptoms in past week												
0	61	17.5	1		1		20	5.8	1		1	
1	46	29.7	1.6	(1.2-2.3)	1.3	(1.0-1.8)	11	7.1	1.2	(0.6-2.4)	1.1	(0.5-2.2)
≥2	25	32.9	1.8	(1.2-2.7)	1.4	(0.9-2.0)	10	13.2	2.2	(1.1-4.5)	1.4	(0.7-3.0)
Smoking												
Never	58	21.7	1		1		15	5.6	1		1	
Former smoker	26	26.3	1.4	(0.9-2.1)	1.1	(0.7-1.5)	15	15.2	2.9	(1.5-5.8)	2.6	(1.3-5.1)
Current smoker	48	22.5	1.0	(0.7-1.4)	0.9	(0.7-1.2)	11	5.2	0.9	(0.4-2.0)	0.9	(0.4-1.9)
LBP in past 12 months												
No	47	13.1	1		1		20	5.6	1		1	
≤1 month in total	68	34.9	2.6	(1.9-3.7)	2.4	(1.7-3.3)	17	8.7	1.6	(0.9-3.1)	1.2	(0.6-2.2)
>1 month in total	17	68.0	4.7	(3.1-6.9)	4.1	(2.8-5.9)	4	16.0	2.8	(1.0-7.9)	2.6	(1.1-6.0)

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[a] Number of subjects with outcome

[b] Percentage of subjects with outcome

[c] Each risk factor analysed in a separate regression model that included sex, age (in four ten-year bands) and occupation

[d] All risk factors analysed in a single regression model that also included sex and age (in four ten-year bands)

[e] Lifting weights >25kg by hand in an average working day

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Table 3

Baseline predictors of persistence of low back pain

Analysis was restricted to the 392 subjects with LBP in the past month at baseline

Predictor	Persistence of low back pain					
	n[a]	%[b]	PRR	(95% CI)[c]	PRR	(95% CI)[d]
Occupation						
Office workers	71	56.8	1.0		1.0	
Nurses	162	60.7	1.1	(0.9-1.3)	1.0	(0.8-1.3)
Occupational lifting [e]	144	61.3	1.2	(0.9-1.5)	1.1	(0.9-1.4)
Adverse beliefs about LBP						
Physical activity	93	58.5	1.0	(0.8-1.1)	0.9	(0.8-1.0)
Work relatedness	196	61.6	1.2	(1.0-1.5)	1.2	(1.0-1.5)
Prognosis	128	64.7	1.2	(1.1-1.4)	1.1	(1.0-1.3)
Mental health						
Good	56	57.7	1		1	
Intermediate	68	55.3	1.0	(0.8-1.2)	0.9	(0.8-1.1)
Poor	109	63.4	1.1	(0.9-1.3)	1.0	(0.9-1.1)
Number of distressing somatic symptoms in past week						
0	115	55.3	1		1	
1	66	60.6	1.1	(0.9-1.3)	1.2	(1.1-1.4)
≥2	52	69.3	1.3	(1.0-1.5)	1.2	(1.1-1.3)
Smoking						
Never	105	62.9	1		1	
Former smoker	51	54.3	0.9	(0.7-1.1)	0.8	(0.7-1.0)
Current smoker	77	58.8	1.0	(0.9-1.2)	0.9	(0.8-1.0)
LBP in past 12 months,						
≤1 month in total	97	48.5	1		1	
>1 month in total	136	70.8	1.4	(1.2-1.7)	1.4	(1.2-1.6)

[a]Number of subjects with outcome

[b] Percentage of subjects with outcome

[c] Each risk factor analysed in a separate regression model that included sex, age (in four ten-year bands) and occupation

[d] All risk factors analysed in a single regression model that also included sex and age (in four ten-year bands)

[e] Lifting weights >25kg by hand in an average working day

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Table 4

Baseline predictors of persistence of disabling low back pain

Analysis was restricted to the 191 subjects with disabling LBP at baseline

Predictor	Persistence of disabling low back pain					
	n[a]	%[b]	PRR	(95% CI)[c]	PRR	(95% CI)[d]
Occupation						
Office workers	20	35.7	1.0		1.0	
Nurses	57	42.2	1.2	(0.8-1.8)	1.4	(1.0-2.0)
Occupational lifting [e]	49	40.5	0.8	(0.5-1.3)	0.9	(0.7-1.1)
Adverse beliefs about LBP						
Physical activity	33	40.2	1.0	(0.7-1.4)	0.9	(0.7-1.2)
Work relatedness	67	42.4	1.3	(0.8-2.3)	1.0	(0.7-1.6)
Prognosis	44	42.3	1.2	(0.9-1.7)	1.1	(0.9-1.3)
Mental health						
Good	14	30.4	1		1	
Intermediate	16	30.8	1.1	(0.6-1.9)	1.2	(0.7-2.1)
Poor	47	50.5	1.7	(1.1-2.7)	1.7	(1.0-2.7)
Number of distressing somatic symptoms in past week						
0	33	34.7	1		1	
1	22	44.9	1.3	(0.9-1.9)	1.3	(0.9-1.8)
≥2	22	46.8	1.3	(0.9-1.9)	1.3	(0.9-1.8)
Smoking						
Never	31	40.3	1		1	
Former smoker	15	31.9	0.8	(0.5-1.4)	0.7	(0.5-1.1)
Current smoker	31	46.3	1.3	(0.9-1.9)	1.1	(0.8-1.4)
LBP in past 12 months,						
≤1 month in total	20	28.6	1		1	
>1 month in total	57	47.1	1.6	(1.1-2.4)	1.6	(1.1-2.4)

[a]Number of subjects with outcome

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[b] Percentage of subjects with outcome

[c] Each risk factor analysed in a separate regression model that included sex, age (in four ten-year bands) and occupation

[d] All risk factors analysed in a single regression model that also included sex and age (in four ten-year bands)

[e] Lifting weights >25kg by hand in an average working day