



Spanish physiotherapists' explanatory models regarding low back pain and its associated factors

Modelos explicativos de los fisioterapeutas españoles sobre el dolor lumbar y sus factores asociados

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Abstract

Background/Aims: Despite new knowledge about pain, the belief that pain and disability stem solely from structural impairments continues to prevail among physiotherapists, often correlating with poorer clinical outcomes. This study aims to describe the explanatory models (EMs) regarding low back pain (LBP) held by Spanish physiotherapists and to analyse associated factors.

Methods: A cross-sectional observational study with Spanish physiotherapists (N=204). The physiotherapists' EMs were estimated using the Relationship Between Pain and Disability in Health Care Professionals (HC-PAIRS), Beliefs and Attitudes in Pain for Physiotherapists (PABS-PT) and Fear-Avoidance (FABQ) questionnaires. The associated factors studied were age, sex, training received and professional experience. Medians with a 95% confidence interval and a multivariate linear regression were performed.

Findings: The factors associated with Spanish physiotherapists' EMs were having only a 3-year bachelor's degree in physiotherapy, having more than 25 years of professional experience and limited training in pain. Questionnaire medians show a descending gradient from 3-year degrees to 4-year degrees and postgraduate studies. However, only a 3-year degree significantly differs from postgraduate studies [HC-PAIRS Coef=7 (95% CI 2.32–11.68); PABS-PT Coef=6 (95% CI 1.70–10.30); FABQ Coef=10 (95% CI 3.04–16.96)] and does not differ from a 4-year degree.

Conclusions: Spanish physiotherapists largely maintain a biomedical EMs for LBP. Postgraduate and pain-specific training are associated with a shift towards less biomedical views, whereas 3- or 4-year degree programs show no impact despite the changes in therapeutic approaches introduced in the 4-year degree. Undergraduate physiotherapy education should place greater emphasis on integrating a biopsychosocial approach.

Keywords

Biomedical model; biopsychosocial model; explanatory model; low back pain; physical therapy specialty.

Resumen

Antecedentes/Objetivos: Pese a los avances en el conocimiento del dolor, persisten creencias estructuralistas entre los fisioterapeutas, asociadas a peores resultados clínicos. Este estudio pretende describir los modelos explicativos (ME) del dolor lumbar (LBP) que utilizan los fisioterapeutas españoles y analizar los factores asociados.

Métodos: Estudio observacional transversal con fisioterapeutas españoles (N=204). Los EM de los fisioterapeutas se estimaron mediante los cuestionarios Relación entre Dolor y Discapacidad en Profesionales de la Salud (HC-PAIRS), Creencias y Actitudes ante el Dolor para Fisioterapeutas (PABS-PT) y Miedo-Evitación (FABQ). Los factores asociados estudiados fueron la edad, el sexo, la formación recibida y la experiencia profesional. Se realizaron medianas con un intervalo de confianza del 95% y una regresión lineal multivariante.

Resultados: Los ME se asociaron con poseer una diplomatura de 3 años, mayor experiencia profesional y formación limitada en dolor. Las medianas del cuestionario muestran una pendiente descendente desde las titulaciones de 3 años hasta las de 4 años y los estudios de posgrado. Sin embargo, solo un título de 3 años difiere significativamente de los estudios de posgrado [HC-PAIRS Coef = 7 (IC del 95 %: 2,32-11,68); PABS-PT Coef = 6 (IC del 95 %: 1,70-10,30); FABQ Coef = 10 (IC del 95 %: 3,04-16,96)] y no difiere de un de 4 años.

Conclusiones: Los fisioterapeutas españoles mantienen mayoritariamente un ME biomédico del dolor lumbar. La formación de posgrado se asocia con perspectivas menos biomédicas, mientras que la formación de grado no muestra impacto significativo. Se recomienda reforzar el enfoque biopsicosocial en el pregrado.

Palabras clave

Dolor lumbar; especialidad de fisioterapia; modelo biomédico; modelo biopsicosocial; modelo explicativo.

Introduction

Low back pain (LBP) is currently the leading cause of disability worldwide, affecting individuals of all ages and becoming increasingly prevalent (Buchbinder et al. 2018). Most cases of LBP are classified as non-specific (approximately 90%) (Koes et al. 2006) since the pathoanatomical cause of the pain cannot be determined (Balagué et al. 2012). Explanatory models (EMs) are frameworks through which patients, their families, and practitioners interpret various aspects of both illness and treatment (Kleinman A 1988). Individuals with LBP often adopt EMs characterized by fears and beliefs that physical activities may cause pain or harm, or that severe pain equates to significant damage (Bunzli et al. 2017). People with these EMs have been related to more severe LBP, disability or symptom chronicity (Bunzli et al. 2017; Paredes-Gómez et al. 2025). In the same way, physiotherapists who address these ailments have traditionally been aligned with the notion that pain and disability are a consequence of a structural alteration, addressing dysfunction only in this dimension (Daykin and Richardson 2004; Foster and Delitto 2011). This therapeutic approach, described as a biomedical model (BM), has proven to be expensive and ineffective (Maher et al. 2017) and has been associated with treatments that often delay the return to work or normal activity (Gardner et al. 2017).

In recent decades, healthcare professionals, including physiotherapists, have developed a new understanding of pain. It is now widely recognized that pain is not solely indicative of pathology or tissue damage but is also influenced by psychological and social factors (Dalkilinc et al. 2015; Sullivan et al. 2016). Similarly, different forms of physical exercise or active work have been established as recommended therapies for LBP, while rest or immobility is now deemed to be counterproductive and potentially harmful (George et al. 2021). Therapeutic interventions based on these new EMs of pain (biopsychosocial models) have shown better results (Kamper et al. 2014; Foster et al. 2018), including the modification of patients' explanatory models (EMs) regarding their condition (Darlow et al. 2012). Despite the conceptual transformation of pain in recent years, research indicates that not all physiotherapists have integrated this change, and that therapeutic models based on a biomedical model still persist. This perspective can reinforce fear and activity avoidance in patients, potentially leading to greater disability and prolonged absence from work (Linton et al. 2002; Emilson et al. 2016). Barriers to adopting the biopsychosocial model include gaps in knowledge, limited skills, and unaddressed attitudes among physiotherapists. Additional challenges may also be caused by workplace constraints and the persistence of patients' biomedical expectations (Mescouto et al. 2022; Van Dijk et al. 2023).

To the authors' knowledge, no comprehensive description currently exists of the EMs concerning LBP held by Spanish physiotherapists. Various factors, including professional training and professional experience may influence the EM developed by physiotherapists. Therefore, this study aims to describe the EM regarding LBP as conceptualized by Spanish physiotherapists and to examine the factors associated with its development.

Method

Participants

A cross-sectional observational study was conducted among physiotherapists in Spain during 2022. The source of information was a 20-minute self-reported online questionnaire consisting of mandatory items (see supplementary material). The sample was collected by disseminating the questionnaire to registered physiotherapists in the different Spanish autonomous communities using the non-probabilistic snowball methodology (men=79; women=125). The questionnaire link, containing project information and informed consent, was distributed via email and social media platforms, according to the information dissemination preferences of participating institutions. The survey was kept open for 2 months (from October 5, 2022, to November 28, 2022) and was created using REDCap software (Harris et al. 2019). Inclusion criteria were being a physiotherapist with at least 2 years of experience, residing in Spain, and speaking fluent Spanish. The analyses were conducted by the first author, under the supervision of a senior statistician, and agreed upon with the rest of the research team..

Dependent variables



The main dependent variable used was the physiotherapist's EM of LBP based on three validated instruments: Health Care Professionals (HC-PAIRS), Beliefs and Attitudes in Pain for Physiotherapists (PABS-PT) and Fear-Avoidance (FABQ) questionnaires. The FABQs were only shared with physical therapists who indicated that they had suffered LBP at some time in their lives.

For the HC-PAIRS instrument, the Spanish validated version was used (Domenech et al. 2013). This tool assesses the extent to which therapists believe that persistent LBP justifies disability and limitation of activities. It comprises fifteen items that suggest a direct relationship between pain and disability. Responses are scored on a 7-point Likert scale (0= "strongly disagree" and 6= "strongly agree"). The HC-PAIRS total score ranges from 0 to 90 points, with higher scores representing a greater belief in the relationship between persistent pain and disability (Houben, Ruud M. A. et al. 2004). In our study, a Cronbach's Alpha of 0.68 was obtained and the model fit validity coefficients using confirmatory factor analysis were less than or equal to 0.073 on the SRMR, 0.779 on the CFI, equal to or less than 0.742 on the equal TLI, and 0.087 on the RMSEA.

Since a validated Spanish version of the PABS-PT was unavailable at the time, a forward-and-backward translation of the existing validated questionnaire was performed (Houben et al. 2005). focusing solely on the biomedical dimension due to its established stability (Brunner et al. 2019). The biomedical dimension of PABS-PT measures the therapist's conviction about the relationship between pain and structural damage in LBP. It consists of 10 items with a total score ranging from 0 to 60 points. Each item of the PABS-PT questionnaire is rated on a scale from 1 to 6 (1: "completely disagree" to 6: "completely agree"). A high score in the biomedical dimension indicates a strong belief in the relationship between pain and tissue damage. In our study, a Cronbach's Alpha of 0.89 was obtained, a temporal stability of 0.80 and the model fit validity coefficients using confirmatory factor analysis were less than or equal to 0.072 on the SRMR, 0.871 on the CFI, equal to or less than 0.834 on the equal TLI and 0.137 on the RMSEA. Temporal stability was tested on a subsample of 32 physiotherapists who were given the PABS-PT questionnaire again after 10-15 days.

The Spanish translation of PABS-PT questionnaire was carried out in four phases: 1) an independent and blinded translation by three individuals, 2) the contrast of the discrepancies with two other reviewers, 3) a back-translation into English by two translators and 4) the analysis of the discrepancies by 3 reviewers. Specialist physiotherapists, professional translators, Spanish, English and American native speakers residing in Spain participated in the process. Finally, the results were shared with the original questionnaire's author (see supplementary table).

For the FABQ version, the Spanish validated version was used (Kovacs et al. 2006). The FABQ questionnaire (Waddell et al. 1993), originally developed to assess LBP patients' attitudes and beliefs regarding fear of movement and avoidance of general physical activities, is relevant in evaluating physiotherapists' own experiences with LBP. The level of fear and avoidance of movement held by a physiotherapist in their own episodes of LBP can influence their EMs and, at the same time, the advice provided to patients, such as recommending more frequent rest or prescribing diagnostic imaging (Gremeaux et al. 2015). Although the pain was mild or had occurred a long time ago, it was still considered valid evidence of current EMs related to low back pain. The FABQ consists of 16 independent statements that can be rated by the participant on a seven-point Likert scale ranging from 0 ("do not agree at all") to 6 ("strongly agree"). The total score ranges from 0 to 96 points, where higher scores indicating stronger fear-avoidance beliefs. In our study, a Cronbach's Alpha of 0.94 was obtained and the model fit validity coefficients using confirmatory factor analysis were less than or equal to 0.098 on the SRMR, 0.687 on the CFI, equal to or less than 0.639 on the TLI and 0.213 on the RMSEA.

Independent variables

The variables that were collected and that could be associated with the EMs of LBP were basic demographic variables, variables related to professional training and variables related to professional experience. The basic demographic variables were age and sex. The variables related to training were the highest educational level achieved (a 3-year bachelor's degree in physiotherapy (pre-Bologna system), a 4-year bachelor's degree in physiotherapy or postgraduate studies), the year of graduation, and the hours of training in pain treatment from a biopsychosocial perspective that they had received after completing their studies in physiotherapy. Participants were asked about any training in neurophysiology of pain, pedagogy in neurophysiology of pain, biopsychosocial approaches in the



treatment of LBP, whether in postgraduate studies, continuing education course, congresses or any form of training, including independent reading and peer training (a colleague explained it to me). The variables related to professional experience were years of professional experience, number of patients with LBP treated monthly LBP and the perception of applying the competencies acquired in the training in the treatment of pain. All these variables were asked directly through the self-reported online questionnaire (see supplementary material).

Ethical aspects

This study adhered to the ethical and legal conditions established in the 2013 Declaration of Helsinki by the World Medical Association. The project was approved by the ethics committee of the University of Vic-Central University of Catalonia (code 213/2022).

Data analysis

The medians of the biomedical dimension of the HC-PAIRS, PABS-PT and FABQ questionnaires of the participants with their confidence intervals (95% CI) were calculated. To see whether the medians of the questionnaire scores were associated with the different independent variables, the median of the dependent variables with their 95% CI was calculated for each of the categories of the independent variables. Finally, the statistical significance of the associations between the dependent and independent variables was assessed using crude and adjusted linear regression models, from which regression coefficients (Coef) and their 95% confidence intervals were obtained. Data analysis was performed with the STATA statistical program, version 17.

Results

The study included a total of 204 physiotherapists (61% female), aged between 24 and 63, with the majority falling within the 31-45 age range. Half of the participants had completed their physiotherapy studies before 2008, 58% had received postgraduate training and 46.08% reported having more than 20 hours of specific pain-related training. Professional experience varied from a minimum of 2 to a maximum of 40 years with an even distribution across tertiles, and 70.6% perceived themselves as applying the skills acquired in specific persistent pain training effectively (Table 1). Figure 1 highlights the distributions of the three dependent variables. HC-PAIRS has a median of 51 with a minimum score of 28 and a maximum of 82, PABS-PT a median of 29 with a minimum score of 10 and a maximum of 57 and FABQ a median of 33 with a minimum score of 16 and a maximum of 96. HC-PAIRS and PABS-PT were completed by all 204 participants, while FABQ was administered to 179, excluding those without a history of low back pain (12.3%). No missing data occurred as all items were mandatory.

Table 1. Characteristics of the people in the sample studied (N=204)

	%	Confidence Interval (95%)	
Age			
18-30 years old	27.0	21.3	33.5
31-45 years old	46.6	39.8	53.5
Over 45 years old	26.5	20.8	33.0
Sex			
Female	61.3	54.4	67.7
Male	38.7	32.3	45.6
Highest educational level achieved			
3-year bachelor's degree in physiotherapy	23.7	18.3	30.0
4-year bachelor's degree in physiotherapy	17.7	13.1	23.7
Postgraduate studies	58.6	51.7	65.2
Year of graduation			
Before 2008	50.0	43.1	56.9
2008-2015	23.0	17.7	29.4
After 2015	27.0	21.3	33.5
Hours of training in pain treatment from a BPSP			
0 -20 hours	53.9	47.0	60.7
21-40 hours	23.5	18.2	29.9
41 hours or more	22.6	17.3	28.8
Years of professional experience			
2-10 years	36.3	29.9	43.1
11-25 years	31.9	25.8	38.6
More than 25 years	31.9	25.8	38.6



Number of patients with low back pain treated monthly			
0-10 patients	41.2	35.1	48.9
11-20 patients	38.7	32.3	45.6
More than 20 patients	19.6	14.7	25.7
Application competencies acquired in training of pain			
Yes	70.6	63.9	76.5
NO	29.4	23.5	36.7

BPSP: biopsychosocial perspective.

Figure 1. Distribution of the medians of the dependent variables. A: Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS); B: Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) y C: Fear Avoidance Beliefs Questionnaire (FABQ).

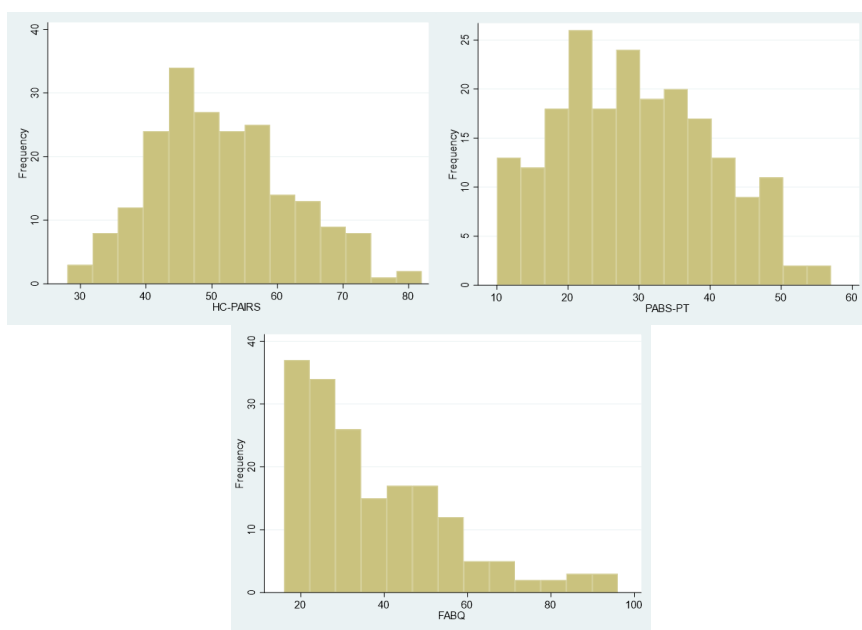


Table 2 outlines the prevalence of the different variables and their influence on the EMs of Spanish physiotherapists, as assessed through the dimensions of the HC-PAIRS, PABS-PT, and FABQ questionnaires. Statistically significant differences were observed for variables including age, highest level of education, years of professional experience, and hours of specific pain-related training. In the HC-PAIRS and PABS-PT questionnaires, the scores obtained by individuals aged between 18 and 30 years old [HC-PAIRS median= 46 (95%CI: 43.71/51); PABS-PT median=25 (95%CI: 23/28)], were lower than those obtained by people over the age of 45 [HC-PAIRS Median=54 (95%CI 51/56. 72); PABS-PT Median=36 (CI95% 30.27/39)]; in the FABQ questionnaire the scores of the 3-year bachelor's degree in physiotherapy [median= 43 (CI95%: 34.07/49. 97)] were higher than those with postgraduate studies [median= 30 (CI95%: 26/33)]; in the PABS-PT and FABQ questionnaires the scores obtained by people with less specific training in pain [PABS-PT median= 33 (CI95%: 29.21/36); FABQ median=38 (CI95%: 34/44.32)], were higher than those obtained by professionals with more training [PABS-PT Median=22. 5 (CI95% 20/28.14) FABQ Median=26 (CI95% 21/29.73)] and, finally, in the PABS-PT questionnaire, the scores obtained by people with less professional experience [median=26 (CI95%: 24.99/30)] were lower than those obtained by people with more experience [Median=36.5 (CI95% 31.27/39)]. In contrast, variables such as sex, year of graduation, number of LBP patients treated monthly, application of pain-specific training, and experiencing persistent LBP showed no significant differences in questionnaire scores.

Table 2. Median and confidence interval of the HC-PAIRS, PABS-PT and FABQ questionnaire scores for each of the variables.

	HC-PAIRS			PABS-PT			FABQ		
	Relationship with disability			Relation to tissue damage			Relation to avoid activity		
	Median	95%CI		Median	95%CI		Median	95%CI	
Age									
18-30 years old	46	43.71	51	25	23	28	32	25.54	37
31-45 years old	51	47	54	29	26	32	31.5	26.39	38.61
Over 45 years old	54	51	56.72	36	30.27	39	37	31.14	47.86
Sex									
Female	53	50	55	30	27	33	35	31.76	40
Male	47	46	51	27	23	30.73	29	25	34.14
Highest educational level achieved									
3-year bachelor's degree in physiotherapy	56.5	49.69	61.31	35	28.69	39.63	43	34.07	49.97
4-year bachelor's degree in physiotherapy	50	46	54	32	27	36	33.5	26	43.87
Postgraduate studies	49	46.29	52	26	23.29	29	30	26	33
Year of graduation									
Before 2008	53	19.58	55	31	27.58	34.42	33.5	29	42
2008-2015	51	46	53	29	24.26	33.74	33.5	26	39.42
After 2015	47	45.42	51	25	23	30.58	31.5	25	37.14
Hours of training in pain treatment from a BPSP									
0 -20 hours	51.5	49	54.79	33	29.21	36	38	34	44.32
21-40 hours	50	45.69	54	25.5	22	30.63	29.5	24.42	35.17
41 hours or more	49	45.86	53	22.5	20	28.14	26	21	29.73
Years of professional experience									
2-10 years	48	46	51.01	26	24.99	30	32	26	36.99
11-25 years	50	46.27	55.73	29	24.54	32	31.5	27.08	40.92
More than 25 years	54	51	57	36.5	31.27	39	38	32	49.89
Number of patients with LBP treated monthly									
0-10 patients	51	47	53.28	27	25	32	34	29.53	41.82
11-20 patients	50	47	56.07	32	26	36	37	29.03	45.97
More than 20 patients	51	46	53.81	30	24	33	33	25.69	40.31
Application competencies acquired in training of pain									
Yes	51	49	53	27	24.73	30	30	26	34
NO	50.5	46.93	54.07	33	29	36.08	39	33	45.29

The values in bold are the significant values. HC-PAIR: Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS); PABS-PT: Pain Attitudes and Beliefs Scale for Physiotherapists y FABQ: Fear Avoidance Beliefs Questionnaire; LBP: Low Back Pain; BPSP: biopsychosocial perspective.

Table 3 contains the results of the multivariate linear regression analysis, showing the factors associated with the EM of LBP related to the BM. These are: the fact of having completed a 3-year bachelor's degree in physiotherapy with respect to postgraduate studies as the highest qualification obtained [HC-PAIRS Coef=-7 (IC95%: -11.68/-2.32); PABS-PT Coef=-6 (CI95% -10.30/-1.70); FABQ Coef=-10 (CI95% -16.96/-3.04)], having more than 25 years of professional experience compared to not having less than 25 year's experience [PABS-PT Coef=9 (CI95% 4.00/14.00)] and having no or little specific training in persistent pain compared to having more than 41 hours [PABS-PT Coef=-7 (CI95% -11.02/-2.98); FABQ Coef=-13 (95%CI -20.23/-5.77)]. Although there is a descending gradient in the medians of the EM of LBP related to the BM (a 3-year bachelor's degree in physiotherapy, a 4-year bachelor's degree in physiotherapy and postgraduate studies), only having a 3-year bachelor's degree in physiotherapy is significant when compared to having postgraduate studies [HC-PAIRS Coef=7 (IC95%:2.32-11.68); PABS-PT Coef=6 (IC95% 1.70-10.30); FABQ Coef=10 (IC95% 3.04-16.96) and is not significant when compared to having 4-year bachelor's degree in physiotherapy.

Table 3. Median differences in the HC-PAIRS, PABS-PT and FABQ questionnaire scores according to categories of the different independent variables.

	HC-PAIRS				PABS-PT				FABQ			
	Raw		Adjusted		Raw		Adjusted		Raw		Adjusted	
	RP	95% CI	RP	95% CI	RP	95% CI	RP	95% CI	RP	95% CI	RP	95% CI
Age												
18-30 years old	0				0				0			
31-45 years old	5	[0.37 9.62]			4	[-9.88 8.99]			0	[-8.46 8.46]		
Over 45 years old	8	[2.77 13.23]			11	[5.35 16.64]			5	[-4.46 14.47]		



Sex												
Female	0			0				0				
Male	-6	[-9.69 -2.30]		0.21	[-7.72 1.72]			-6	[- 13.47 1.47]			
Highest educational level achieved												
3-year bachelor's degree in physiotherapy	0		0	0		0		0		0		
4-year bachelor's degree in physiotherapy	-6	[- 12.04 0.04]	-6	[- 12.03 0.03]	-3	[- 10.31 4.31]	1	[-4.84 6.84]	-10	[- 20.02 0.20]	-5	[- 14.11 4.11]
Postgraduate studies	-7	[- 11.68 - 2.32]	-7	[- 11.68 -2.31]	-9	[- 14.67 - 3.33]	-6	[- 10.30 - 1.70]	-14	[- 21.62 -6.38]	-10	[- 16.96 -3.04]
Year of graduation												
Before 2008	0			0				0				
2008-2015	-2	[-6.48 2.48]		-2	[-7.27 3.27]			0	[-9.18 9.17]			
After 2015	-6	[- 10.25 - 1.75]		-6	[- 11.00 - 1.00]			-2	[- 10.42 6.42]			
Hours of training in pain treatment from a BPSP												
0-20 hours	0			0		0		0			0	
21-40 hours	-2	[-7.09 3.09]		-7	[- 12.05 - 1.95]	-4	[-8.00 0.00]	-8	[- 16.00 0.01]	-8	[- 15.40 -0.60]	
41 hours or more	-3	[-8.17 2.17]		-10	[- 15.13 - 4.87]	-7	[- 11.01 - 2.98]	-12	[- 19.95 -4.15]	-13	[- 20.23 -5.77]	
Years of professional experience												
2-10 years	0			0		0		0				
11-25 years	2	[-2.47 6.47]		3	[-1.67 7.66]	2	[-1.93 5.93]	0	[-7.55 7.55]			
More than 25 years	6	[0.52 11.48]		10	[4.27 15.72]	9	[4.00 14.00]	6	[-3.16 15.16]			
Number of patients with LBP treated monthly												
0-10 patients	0			0				0				
11-20 patients	-1	[-5.38 3.38]		5	[-0.53 10.53]			3	[-6.30 12.30]			
More than 20 patients	0	[-5.20 5.20]		3	[-3.56 9.56]			-1	[- 12.17 10.17]			
Application competencies acquired in training of pain												
Yes	0			0				0				
NO	0	[-4.26 4.27]		-6	[- 10.91 - 1.09]			-9	[- 16.27 -1.72]			

The values in bold are the significant values. HC-PAIR: Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS); PABS-PT: Pain Attitudes and Beliefs Scale for Physiotherapists y FABQ: Fear Avoidance Beliefs Questionnaire; LBP: Low Back Pain; BPSP: biopsychosocial perspective.

Discussion

The median scores for the three questionnaires assessing the explanatory models of Spanish physiotherapists regarding LBP in the studied sample were 51 for the HC-PAIRS (range: 0–90), 29 for the PABS-PT (range: 0–60), and 33 for the FABQ (range: 0–96). These results indicate a continued reliance on biomedical models among Spanish physiotherapists, particularly evident in the HC-PAIRS and PABS-PT scores. In addition, certain variables were significantly linked to these explanatory models. Postgraduate education or specific pain-related training was associated with less biomedical EM. This suggests a broader understanding that pain and disability are not solely due to physical alterations. Conversely, greater professional experience was correlated with a stronger adherence to a biomedical EM of LBP. Interestingly, no significant difference was observed between participants with a 3-year or a 4-year bachelor's degree in physiotherapy.



Before interpreting the results, it is important to acknowledge certain limitations of our study. The first limitation is the type of sampling used as this method may not accurately represent the broader population of physiotherapists (Beauchemin and González-Ferrier 2011). This could overestimate the responses due to some interest (for example, physiotherapists with a greater link to research and with greater empathy for answering this type of questionnaire) or limit the responses from some autonomous communities where the professional associations did not help us to disseminate them. Nevertheless, different physiotherapist profiles were identified based on sociodemographic data available in Spain (National Statistics Institute 2023), and the model was adjusted for these variables. The second limitation of the study is the use of a non-validated questionnaire (Spanish version of PABS-PT) even though the corresponding metrics were performed for this study with acceptable results (see dependent variables section).

Our findings revealed that physiotherapists in the sample scored intermediate levels on the biomedical dimensions of the HC-PAIRS and PABS-PT, indicating a predominantly biomedical EM of LBP. Many physiotherapists still perceive persistent LBP as justifying disability and activity limitations and maintain strong convictions about a direct relationship between pain and structural damage. This trend aligns with findings in other countries, where biomedical models also persist. For example, in Sweden (2002), in relation to LBP, 69% of physiotherapists advised avoiding painful movements, 46% considered that pain reduction was essential for returning to work, 29% supported sick leave as a treatment, 11% related pain intensity to injury severity and only 4% recognized psychological factors (Linton et al. 2002). In English primary care, physiotherapists acknowledged the need for a biopsychosocial model but struggled with managing psychosocial aspects, focusing primarily on physical factors (Cowell et al. 2018). These EMs and stated practical behaviours are contrary to recent recommendations for the treatment of LBP (Kamper et al. 2014; Wong et al. 2017; Tagliaferri et al. 2020), which emphasize providing clear information about continuing activities even if there is some pain (George et al. 2021). Physiotherapists' EMs should shift from a biomedical to a biopsychosocial framework, viewing pain and disability as influenced by psychological and social factors. However, this study shows limited progress in Spain, likely due to the confusion between models, insufficient focus on psychosocial aspects, contextual barriers, and patient expectations for biomedical approaches (Mescouto et al. 2022; Van Dijk et al. 2023).

On the other hand, in our study, the FABQ scores of Spanish physiotherapists were relatively lower compared to the scores in HC-PAIRS and PABS-PT, suggesting that their EM of LBP was based on assessing fear of movement and avoidance in general of physical activities and was closer to the ideal, moving away from the biomedical EM. These findings may be related to two key factors. In the first place, this could be due to the fact that the questionnaire focuses on movement and physical activity, aspects that physiotherapists usually consider as standard treatment for LBP (Jeffrey and Foster 2012). Therefore, although physiotherapists may understand LBP from a purely mechanical nature (an understanding more aligned to the BM), there may be a greater acceptance of physical activity in LBP. Secondly, the FABQ focuses on physiotherapists' personal experiences of pain. Compression of self-experienced pain may differ slightly from compression of LBP in general, despite the relationship that has been shown elsewhere (Gremeaux et al. 2015).

The findings of this study indicate that postgraduate education or specific training in pain is associated with Spanish physiotherapists adopting a less biomedical EM of LBP, as opposed to having solely received training during a 3- or 4-year bachelor's degree in physiotherapy. Postgraduate training appears to align with the biopsychosocial understanding of pain, which views it as an interaction of tissue, the psychological part of the person and the social context in which they develop. This shift is essential in moving away from the traditional biomedical EM often associated with physiotherapy practices (Pincus et al. 2013; Synnott et al. 2015). Additionally, the data suggests that adopting a less biomedical EM might be easier during advanced stages of training when physiotherapists have greater professional maturity. Conversely, earlier stages of education may perpetuate more biomedical perspectives. Despite this, older physiotherapists, those who graduated some time ago and those with more years of professional experience scored higher (more aligned with BM) on the questionnaires (even though, only the latter showed significant scores). This suggests that both age and years of professional practice do not necessarily relate to physiotherapists having biomedical EMs regarding pain; instead, these models may be reinforced without further education. Postgraduate training emerges as a pivotal factor in transforming these EMs of pain.



In addition to this, the study highlights no significant difference between the impact of a 3-year (pre-Bologna) or 4-year bachelor's degree on the EMs of LBP held by physiotherapists. The transition from a 3-year to a 4-year curriculum in 2008, which introduced a broader scope incorporating physical, psychological, and social dimensions into the competency framework of physiotherapy studies (CIN Order 2008), did not yield immediate or substantial changes in professional perspectives. Similarly, the White Book on Physiotherapy (2004) proposed reforms to align Spanish degrees with European standards, emphasizing a holistic approach to patient care that includes psychological and social factors. However, the delay in translating these curriculum changes into teaching practices and professional behaviors suggests that such shifts require significant time to manifest.

Similar challenges exist in other countries' educational systems. In Brazil, for example, a 2019 study involving recently graduated physiotherapists revealed limited comprehension of the biopsychosocial model, an inadequate ability to apply it in clinical practice for LBP patients and unclear professional roles (França et al. 2019). The persistence of a biomedical model among Spanish physiotherapists, compounded by patient expectations for such approaches (Van Dijk et al. 2023), suggests the need for enhanced pedagogical strategies in physiotherapy training to reinforce the biopsychosocial understanding of pain. Likewise, undergraduate training should favour biopsychosocial therapeutic approaches in the conception and approach to LBP, achieving learning results in future professionals that are more in line with current guidelines in the management of LBP (Knezevic et al. 2021).

Finally, the study found no significant relation between variables such as sex, the number of LBP patients treated, or the application of specific training programmes and the EMs held by physiotherapists. This reinforces the conclusion that the strongest association with EMs appears to be linked to the nature of the training received rather than the biological characteristics or specific aspects of professional practice such as the type of patients treated.

Conclusions

The persistence of LBP EMs still very much aligned with a BM remains prevalent among Spanish physiotherapists. These models primarily attribute pain and disability to physical alterations, diverging from the biopsychosocial models widely recommended today. A less biomedical EM is associated with postgraduate education or specific pain-focused training. On the contrary, the length of undergraduate training—be it three or four years—does not appear to be significantly associated with this perspective despite the conceptual change in therapeutic approaches dictated by the CIN Order (2008). The specificity of postgraduate training and the greater maturity of the students who undertake it may explain the ability in these cases to adopt more holistic and current models, such as the biopsychosocial model. Undergraduate physiotherapy education should more effectively promote biopsychosocial approaches as a strategy to address LBP, with teachers trained in this model and more effective pedagogical programmes adapted to the undergraduate student.

Supplementary digital content

- A. Spanish version of Beliefs and Attitudes in Pain for Physiotherapists Questionnaire;
- B. Self-reported online questionnaire

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