

## Original article

# Physiotherapists' attitudes and beliefs about low back pain influence their clinical decisions and advice

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## ABSTRACT

**Background:** Physiotherapists' biomedical orientation influences the implementation of evidenced-based care for low back pain (LBP) management. However, information on physiotherapists' own beliefs about their back and LBP and the influence of these on clinical decisions and advice is lacking.

**Objectives:** To identify attitudes and beliefs about LBP among physiotherapists and to analyse the association of these beliefs with physiotherapists' individual characteristics and clinical decisions and advice.

**Design:** Cross-sectional survey.

**Method:** Attitudes and beliefs about LBP were measured with the Back-Pain Attitudes Questionnaire (Back-PAQ) among French-speaking Swiss physiotherapists. Physiotherapists' clinical decisions and advice were assessed with a clinical vignette to determine their association with the Back-PAQ score.

**Results:** The study included 288 physiotherapists. The mean Back-PAQ score (82.7; SD 17.2) indicated the presence of helpful beliefs in general, but unhelpful beliefs in relation to back protection and the special nature of LBP (nature of pain, impact, complexity) were frequently identified. Individual characteristics explained 17% of the Back-PAQ score. Unhelpful beliefs were associated with clinical decisions toward back protection and movement avoidance ( $r = -0.47$ ,  $p < 0.001$ ).

**Conclusions:** While helpful beliefs and guidelines consistent decisions were generally identified, unhelpful beliefs about back protection and the special nature of LBP were frequently present among physiotherapists. These unhelpful beliefs were associated with less optimal clinical decisions. Educational approaches should challenge unhelpful beliefs and empower physiotherapists to provide explanations and management that increases patients' confidence in the back. Future research should investigate the effect of educational strategies on implementation of best practice for LBP management.

## 1. Introduction

Low back pain (LBP) is the leading cause of disability worldwide (Abbasfati et al., 2020). Many factors that contribute to disability have been identified, suggesting that this condition is complex and multidimensional (Hartvigsen et al., 2018). Among these, psychological factors such as catastrophizing, pain-related fear, psychological distress and unhelpful beliefs have been shown to influence pain and disability in patients with LBP (Crombez et al., 2012; Darlow, 2016).

Unhelpful beliefs about LBP are thought to underlie many of the

psychological factors that are associated with pain and disability (Darlow, 2016; Linton and Shaw, 2011). For instance, beliefs that the back is fragile and needs protection are common (Christe et al., 2021b; Darlow et al., 2014b; Pierobon et al., 2020) and have been associated with higher levels of pain-related fear and avoidance behaviours (Briggs et al., 2010; Bunzli et al., 2015; Christe et al., 2021a). Consequently, addressing unhelpful beliefs is considered a priority in the management of LBP (Buchbinder et al., 2018).

Health professionals' beliefs are particularly important to consider, as these have been shown to influence patients' beliefs and contribute to

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difficulties implementing LBP guidelines (Darlow et al., 2012, 2013; Gardner et al., 2017). Among health professionals, physiotherapists spend a significant amount of time with patients and play a major role in providing information about LBP (Foster et al., 2018; Kamper et al., 2015). Thus, given that the implementation of evidence-based knowledge is a key priority in LBP management (Buchbinder et al., 2018), more understanding about physiotherapists' LBP beliefs is needed.

Previous studies have demonstrated that physiotherapists' clinical decisions are associated with their treatment orientation (e.g. biomedical/biopsychosocial), beliefs about the relationship between patients' pain and functional limitations and beliefs that patients should avoid activity to prevent pain or injury (Darlow et al., 2012; Gardner et al., 2017; Leysen et al., 2020). However, there is a lack of knowledge about physiotherapists' own beliefs about their back and LBP, and whether these beliefs influence their clinical decisions and recommendations to patients. The Back Pain Attitudes Questionnaire (Back-PAQ) questions respondents' views of their own back and their attitudes about movement, activity, and recovery behaviours when they have back pain (Darlow et al., 2014a). The Back-PAQ is an appropriate tool to explore physiotherapists' beliefs that may underpin patient management decisions. Furthermore, there is a paucity of data on which individual characteristics, if any, may influence physiotherapists' beliefs (Darlow et al., 2012; Gardner et al., 2017; Ostelo et al., 2003; Pincus et al., 2007).

Therefore, this study has three objectives: (1) To assess beliefs about LBP among French-speaking Swiss physiotherapists; (2) To analyse whether individual characteristics predict the level of unhelpful beliefs (3) To analyse the association between physiotherapists' clinical recommendations and beliefs about LBP. It was hypothesized that a higher level of unhelpful beliefs about LBP would be associated with clinical decisions and advice that rely more strongly on back protection, avoidance of movement and passive treatment options.

## 2. Methods

### 2.1. Design

This study was a prospective observational cross-sectional survey and is reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) criteria (von Elm et al., 2007).

### 2.2. Participants

To be included participants had to be physiotherapists currently working in the French-speaking part of Switzerland, which includes the states of Vaud, Valais, Genève, Fribourg, Neuchâtel, Jura and Bern. There is no official record of the number of physiotherapists working in this area, but combining state and professional association registries estimates the number to be approximately 3000. All practising physiotherapists could participate. Physiotherapists were excluded if they had insufficient level of French to understand the survey questions (a number of non-French speaking physiotherapists practice in this region). Recruitment was conducted using a non-probabilistic snowball sampling technique. An email with a link to a RedCap survey (Harris et al., 2019) was distributed through local physiotherapy associations, alumni associations, clinical educators, heads of physiotherapy departments and researchers' contacts from the December 21, 2018 to the March 25, 2019. All people who received the invitation were asked to forward it to their own physiotherapy contacts to promote a wider diffusion through a snowball technique. All participants received information about the study and the anonymity of data collection, and could choose whether to participate. The State Research Ethics Committee approved the project (REQ-2018-00827).

### 2.3. Outcomes

Physiotherapists were asked to provide information about individual characteristics (see Appendix I for details and Table 1). The validated French version of the Back Pain Attitudes Questionnaire (Back-PAQ) was used to assess physiotherapists' own attitudes and beliefs about LBP (Darlow et al., 2014a; Demoulin et al., 2017). The questionnaire includes 34 items that score on a Likert scale ranging from 1 to 5 points (False, Possibly false, Unsure, Possibly true, True). The total score ranges from 34 to 170 points, with higher scores indicating more unhelpful beliefs. Eleven questions have their score reversed. Items are also grouped in six different themes, which are 'the vulnerability of the back' (vulnerability), 'the need to protect the back' (protection), 'the correlation between pain and injury' (pain), 'the special nature of back pain' (LBP is special, with regard to the nature of pain, its impact, and its complexity), 'activity participation while experiencing back pain' (activity) and 'the prognosis of back pain' (prognosis). The Back-PAQ demonstrated high internal consistency ( $\alpha = 0.91$ ), excellent test-retest reliability (ICC 2,1 = 0.84) and good convergent validity with other instruments amongst health professionals (Moran et al., 2017).

Finally, clinical decisions and advice from the physiotherapists were assessed with a French translation of a clinical vignette that has been previously used in several studies (Bombardier et al., 1995; Briggs et al., 2013; Darlow et al., 2019; Evans et al., 2010). The vignette described the case of a young woman with acute LBP and no sign of serious pathology. Five questions were asked in relation to the vignette. Each question was scored with one point given when guideline or evidence-concordant responses were selected. Therefore, a maximum of five points could be achieved for the five questions of the vignette.

Three questions addressed the recommendations about activity, work and bed-rest. For each of these questions, there were five answers on a five-point ordinal scale ranging from complete avoidance (e.g. limits all physical activities, remains off work, or rest in bed) to no limitation (e.g. does not limit any activity, works full duties/full time, avoids resting in bed entirely). Responses were dichotomized into recommendation toward avoidance (no point) or recommendation toward no limitation (one point). The dichotomization was based on previous research that asked LBP experts to determine the

**Table 1**  
Differences on the Back-PAQ score according to the participants' characteristics (n = 288).

MSK: musculoskeletal physiotherapy; LBP: low back pain. The total Back-PAQ score ranges from 34 to 170 points, with higher scores indicating more unhelpful beliefs. P-value: statistical significance of the difference in Back-PAQ score between Male/Female or Yes/No. Age and years of experience are presented in mean (SD). r: Spearman correlation with the Back-PAQ score.

		N	%	Back-PAQ mean	SD	p-value
<b>All</b>		288	100	82.70	17.20	
<b>Gender</b>	Male	99	34.4	82.14	17.20	0.69
	Female	189	65.6	82.99	17.24	
<b>Master diploma</b>	Yes	40	13.9	78.83	19.93	0.18
	No	248	86.1	83.33	16.68	
<b>Field of expertise in MSK</b>	Yes	200	69.4	81.29	17.39	0.03
	No	88	30.6	85.91	16.41	
<b>Involvement in physiotherapy education</b>	Yes	56	19.4	78.66	18.43	0.07
	No	232	80.6	83.68	16.79	
<b>Past personal experience of LBP</b>	Yes	190	66.0	83.61	17.00	0.22
	No	98	34.0	80.95	17.54	
<b>Current personal experience of LBP</b>	Yes	28	9.7	96.82	9.88	<0.001
	No	260	90.3	81.18	17.14	
				<b>r</b>		
<b>Age</b>	40.8 (11)	288	100	0.27		<0.001
<b>Years of experience</b>	15.9 (11.1)	288	100	0.28		<0.001

recommendations that are the most guideline consistent (Evans et al., 2005).

Two additional questions were developed for this survey (Appendix II). One question aimed to determine which treatment(s) physiotherapists would propose to this patient as a first step (Manual therapy; Electrotherapy or heat pack; Stretching; Complementary techniques; Progressive exercises). This question interrogated the willingness to propose an active treatment as soon as possible, with or without passive techniques (respondents could select more than one option); one point was given when 'progressive exercises' was chosen (regardless of whether any other answers were also chosen), and no point was given when 'progressive exercises' was not selected (NICE, 2016). We did not propose education as a treatment choice, because it can be both offered in helpful (e.g. being active is helpful) and unhelpful ways (e.g. you should be careful when you move), and this questionnaire would not have captured these differences. The second supplementary question explored advice from physiotherapists towards protection or utilization of the back to prevent recurrences of LBP. Participants could choose between the following advice (multiple answers possible): be careful of her posture; be careful to keep her back straight when carrying weights of more than 5 kg; avoid carrying weights over 10 kg; gradually resume flexion and rotation of the back; gradually resume weights lifting in daily life. One point was given only if participants selected the last two answers together without selecting any of the other answers, suggesting a belief that loading and using the back is beneficial. In all other situations, no point was given (O'sullivan et al., 2020; Saraceni et al., 2020). The rating of these two last questions was determined by asking 10 LBP experts (3 medical doctors and 7 physiotherapists with recognized expertise within the field of LBP who were involved in LBP academic teaching and/or research) to answer these questions.

#### 2.4. Statistical analysis

Only fully completed questionnaires were included in analyses. Normality of data was assessed visually using QQ plots and tested with the Shapiro-Wilk test (Ghasemi and Zahediasl, 2012). Mean and standard deviation (SD) were calculated for the total score, and median and interquartile ranges were reported for the themes' scores. For each Back-PAQ item, the frequency of each response and the mean score were calculated as in previous reports (Darlow et al., 2014b).

The relationship between physiotherapists' beliefs and all individual characteristics was tested, as there is a paucity of data in the literature to inform hypotheses (Darlow et al., 2012; Gardner et al., 2017). The rationale of the inclusion of years of experience is based on the possibility that initial training date and experience developed over years affect beliefs about LBP. The inclusion of age is based on the rationale that, due to the evolution of cultural representations of the back over time, older physiotherapists may have different beliefs than younger ones about LBP. Spearman correlations between the Back-PAQ score and age or years of experience were calculated, respectively. The significance level of differences for Back-PAQ scores according to all other individual characteristics were calculated using independent t-tests. Then, a multiple regression was conducted to determine the variance explained in the Back-PAQ total score by the individual characteristics. Assumptions for linear regression were assessed. Age was not entered in the model because of the large correlation with years of experience ( $r = 0.98$ ) that induced multicollinearity.

Frequencies of each clinical decision were reported as a percentage of responders. Differences in Back-PAQ score with respect to recommendations, treatment and advice, respectively, were tested using independent t-tests. Spearman correlations were calculated between the total vignette score and the Back-PAQ total score and mean score of each item, respectively. Statistical analyses were performed with SPSS (Version 23, IBM, NY, USA), using a significance level set a priori at  $\alpha < 0.05$ .

#### 2.5. Sample size

Based on previous studies (Gardner et al., 2017), the sample size was calculated to test the association between LBP beliefs and clinical decisions with an estimated correlation coefficient of 0.25. Using a power of 0.8 and  $\alpha$  error of 0.05, the minimum sample size to meet these criteria was 123.

### 3. Results

The questionnaire was accessed 369 times, with 43 questionnaires left totally blank and 38 incomplete. Therefore, the study included 288 physiotherapists. Participants' characteristics and their association with the Back-PAQ score are presented in Table 1. In the multiple regression model, individual characteristics explained 18.2% of the variance of the total score of the Back-PAQ ( $F(7, 280) = 10.109, p < 0.001$ ). In this model, having less experience, being involved in physiotherapy education, having a field of expertise in MSK physiotherapy and not having current disabling LBP were significantly associated with a lower Back-PAQ score (more helpful beliefs) (Table 2). The different themes' scores are displayed in Fig. 1, with 'protection' and 'LBP is special' having the highest median scores (strongest unhelpful beliefs). The response frequencies for each Back-PAQ item are shown in Table 3.

Clinical decisions based on the vignette are shown in Table 4, with differences in Back-PAQ score according to the physiotherapists' answers. While most of the participants indicated that they would advise resuming flexion and rotation and lifting weights again, only 23.3% choose these two statements without choosing unhelpful advice about posture and movements. Clinical decisions based on the five questions of the vignette (mean score: 2.8 (1.3)) were negatively associated with the Back-PAQ score ( $r = -0.47, p < 0.001$ ), demonstrating that physiotherapists with more unhelpful beliefs make more clinical decisions toward avoidance and advice to protect the back.

### 4. Discussion

This study found that unhelpful beliefs about back protection and the special nature of LBP are prevalent among French-Speaking Swiss physiotherapists. As hypothesized, unhelpful beliefs were associated with physiotherapists treatment recommendations and advice to patients toward more back protection, avoidance of movement and passive treatment strategies.

#### 4.1. Physiotherapists' beliefs about LBP

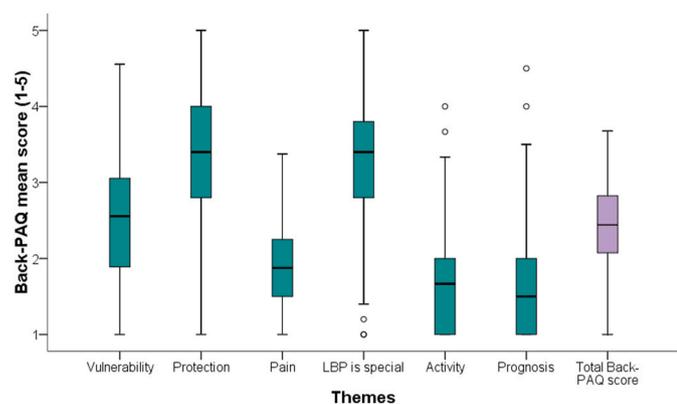
Physiotherapists' unhelpful beliefs were frequently related to the vulnerability and the need for protection of the back. The majority of physiotherapists believed that good posture is important to protect the back (Q8), that it is not safe to lift without bending the knees (Q5) and

**Table 2**

#### Regression model

B: Beta Coefficients;  $\beta$  (stand.): Standardized Beta Coefficients; LBP: low back pain.

Dependent variable: Back-PAQ total score			
$R^2: 0.202$ ; Adjusted $R^2: 0.182$			
	B	$\beta$ (stand.)	p-value
(Constant)	80.692		<0.001
Gender (female)	0.146	.004	0.941
Years of experience	.494	.318	<0.001
Having a master diploma	-.557	-.011	0.846
Involvement in physiotherapy education	-7.244	-.167	0.004
Field of expertise in MSK	-7.484	-.201	<0.001
Past personal experience of LBP	.913	.025	0.648
Current personal experience of LBP	14.176	.245	<0.001



**Fig. 1. Back-PAQ total and each theme median score.** Box plots show median, lower and upper quartile, range and outliers (open circles, 1.5 interquartile range). Higher scores indicate more unhelpful beliefs. Total Back-PAQ score is the mean score per question with all items included.

that care should be taken to avoid back injury (Q11). Furthermore, beliefs that the back can be damaged if overused (Q9) and that activities should be reduced until pain stops (Q10, Q21) were common. These findings indicate that many physiotherapists view the back as fragile and have a biomechanical view of LBP (Gardner et al., 2017). The contemporary understanding is that the back is a strong structure and that LBP is best managed with progressive back use and loading (Hartvigsen et al., 2018; O’sullivan et al., 2020). As beliefs about vulnerability and protection are considered as drivers of pain-related fear and avoidance behaviours (Christe et al., 2021a; Crombez et al., 2012), it is important that physiotherapists can identify and address these rather than reinforcing them.

Many physiotherapists felt that it is important to see a health care professional and to know exactly what is wrong when having LBP (Q18, Q20, Q23-24). These beliefs suggest that physiotherapists view LBP through a biomedical lens where pathoanatomical diagnosis dictates management (Gardner et al., 2017; Josephson et al., 2013). In contrast to these beliefs, the natural history of LBP is largely unaffected by health care, specific diagnosis is neither possible nor useful in most cases, and self-management is strongly recommended (Buchbinder et al., 2018; Hartvigsen et al., 2018). The beliefs found in this survey may lead to over-treatment, hinder development of self-management strategies and increase health costs without additional benefits (Darlow, 2016; Gardner et al., 2017; Hill et al., 2011).

Conversely, the sample’s mean Back-PAQ score (83) indicated the presence of helpful beliefs in general amongst physiotherapists compared to those of the general population (mean score 113) or patients (mean score 120) (Christe et al., 2021b; Demoulin et al., 2017). Physiotherapists had helpful beliefs about being active while experiencing LBP (Q25, Q27) and most physiotherapists acknowledged the role of psychological factors in LBP (Q15-16, Q29-31). While this is consistent with current knowledge, the large proportion of biomechanical beliefs also present may impede transition to a biopsychosocial model of care. Previous research has shown that many physiotherapists have difficulty dealing with psychosocial factors and implementing the biopsychosocial model in practice (Synnott et al., 2015; Valenzuela-Pascual et al., 2019).

**4.2. Influence of individual characteristics**

Individual factors were associated with physiotherapists’ beliefs about LBP. Helpful beliefs were more frequent among physiotherapists with less years’ experience, those whose field of expertise was in musculoskeletal physiotherapy, those involved in physiotherapy education and those without current disabling LBP. The workplace environment, field of expertise and contact with patients with LBP also

**Table 3**  
**Back-PAQ results for each question of the Back-PAQ and their association with clinical vignette answers (n=288)**

Items are ordered from most strongly held unhelpful to the least strongly held unhelpful beliefs in the survey sample. r: Spearman correlation; Prot: Protection, SP: LBP is special, Vuln: Vulnerability, Acti: Activity and Prog: prognosis. \*: p-value less than 0.05; \*\*: p-value less than 0.01; #: the mean score of these items has been reversed, so that higher mean score also indicates more unhelpful beliefs.

Theme	Question	True (%)	Possibly True (%)	Mean	(SD)	Association with clinical vignette (r)
Prot	8) Good posture is important to protect your back	66.7	20.8	4.4	(1.0)	-0.24**
Prot	7) It is important to have strong muscles to support your back	58.0	28.1	4.3	(1.0)	0.00
SP	18) Having back pain makes it difficult to enjoy life	26.7	46.9	3.8	(1.1)	0.02
SP	20) It is hard to understand what back pain is like if you have never had it yourself	27.8	39.6	3.7	(1.2)	-0.04
Vuln	12) You can injure your back and only become aware of the injury sometime later	31.3	32.6	3.6	(1.4)	-0.13*
SP	23) It is important to see a health professional when you have back pain	21.5	33.3	3.4	(1.3)	-0.15*
Vuln	5) Lifting without bending the knees is not safe for your back	36.5	15.3	3.3	(1.6)	-0.27**
Prot	11) You could injure your back if you are not careful	23.3	29.5	3.2	(1.4)	-0.22**
Pain	22) If you ignore back pain, you may cause damage to your back	12.5	33.3	3.0	(1.4)	-0.29**
SP	24) To effectively treat back pain you need to know exactly what is wrong	22.2	18.8	3.0	(1.5)	-0.23**
Vuln	9) If you overuse your back, it will wear out	17.7	25.0	3.0	(1.4)	-0.20**
Vuln	4) Sitting is bad for your back	13.9	22.2	2.7	(1.4)	-0.01
SP	19) It is worse to have pain in your back than your arms or legs	5.2	16.0	2.7	(1.2)	-0.13*
Prot		9.0	19.1	2.4	(1.4)	-0.33**

(continued on next page)

Table 3 (continued)

Theme	Question	True (%)	Possibly True (%)	Mean	(SD)	Association with clinical vignette (r)
	21) If your back hurts, you should take it easy until the pain goes away					
Acti	26) When you have back pain the risks of vigorous exercise outweigh the benefits	8.0	15.6	2.4	(1.3)	-0.32**
Vuln	6) It is easy to injure your back	9.7	16.0	2.4	(1.4)	-0.10
Prot	10) If an activity or movement causes back pain, you should avoid it in the future	9.4	13.2	2.3	(1.3)	-0.27**
Pain #	31) Expecting your back pain to get better helps you to recover from back pain	28.5	42.4	2.1	(1.0)	-0.21**
Vuln #	3) Bending your back is good for it	43.8	25.0	2.1	(1.0)	-0.21**
Vuln #	1) Your back is one of the strongest parts of your body	35.1	35.4	2.1	(1.1)	-0.23**
Pain #	30) Focussing on things other than your back helps you to recover from back pain	31.6	42.7	2.1	(1.0)	-0.22**
Vuln	14) A twinge in your back can be the first sign of a serious injury	4.2	11.5	2.0	(1.2)	-0.20**
Pain #	29) Worrying about your back can delay recovery from back pain	35.4	37.5	2.0	(1.0)	-0.31**
Pain #	17) When you have back pain, you can do things which increase your pain without harming the back	51.7	26.7	1.8	(1.1)	-0.28**
Prog	33) There is a high chance that an episode of back pain will not resolve	2.8	9.0	1.8	(1.1)	-0.15*
Prog #	28) Most back pain settles quickly, at least enough to get on with normal activities	50.7	32.3	1.8	(0.9)	-0.24**
Prog	32) Once you have had back pain there is	1.0	7.3	1.7	(1.0)	-0.14*

Table 3 (continued)

Theme	Question	True (%)	Possibly True (%)	Mean	(SD)	Association with clinical vignette (r)
	always a weakness					
Vuln #	2) Your back is well designed for the way you use it in daily life	63.9	23.3	1.6	(0.9)	-0.10
Pain	13) Back pain means that you have injured your back	1.0	5.6	1.6	(0.9)	-0.13*
Acti	25) If you have back pain you should avoid exercise	0.3	1.4	1.4	(0.7)	-0.26**
Pain #	16) Stress in your life (financial, work, relationship) can make back pain worse	74.7	19.1	1.3	(0.7)	-0.14*
Pain #	15) Thoughts and feelings can influence the intensity of back pain	75.7	20.5	1.3	(0.6)	-0.20**
Acti #	27) If you have back pain you should try to stay active	85.4	11.1	1.2	(0.7)	-0.26**
Prog	34) Once you have a back problem, there is not a lot you can do about it	0.3	1.4	1.2	(0.6)	-0.11

seems to influence conceptions of LBP and clinical decisions (Roitenberg, 2019; Widerström et al., 2019), suggesting that physiotherapists who manage patients with LBP more regularly have slightly more helpful beliefs. Interestingly, having current disabling LBP had a strong negative association with LBP beliefs, whereas having had a history of LBP did not. Our findings suggest that this personal experience of LBP may temporarily have a negative effect on physiotherapists' beliefs about LBP, and therefore patient management and advice. Physiotherapists who experience LBP should be aware of the potential impact their pain may have on patient care. Nonetheless, these findings should be confirmed with larger samples, as only 10% of our participants experienced current LBP.

#### 4.3. Physiotherapists' recommendations

While 70% of physiotherapists gave advice suggesting that activities should be resumed, 50% also recommended work limitations and bed rest. Compared to previous research with the same questions (Evans et al., 2010; Hendrick et al., 2013), the proportion of Swiss French-speaking physiotherapists providing avoidant recommendations was high. Regarding the first treatment strategy, a large majority of physiotherapists selected progressive exercises and manual therapy, which suggests that they follow current recommendations. Only a small proportion chose electrotherapy, which is recommended against by recent guidelines and reviews (Foster et al., 2018; NICE, 2016).

While most physiotherapists thought it was advisable to stay active and recommended progressive exercises, our data indicate that many may face a cognitive conflict concerning the advice they should provide. Three quarters of respondents thought that they should advise patients to gradually load the back and simultaneously provide protective

**Table 4**

Physiotherapists' answers for recommendations, treatment choices and advice following the clinical vignette, and relation with Back-PAQ score.

Recommendations to patient	N		%		Back-PAQ		mean difference in Back-PAQ (95% CI)			p-value	
	Toward avoidance/rest	Toward no limitation									
Activity	87	30.2%	86.38	201	69.8%	81.11	5.27	(0.96	to	9.58)	0.02
Work	153	53.1%	87.23	135	46.9%	77.57	9.66	(5.81	to	13.5)	<0.001
Bed-rest	141	49.0%	86.59	147	51.0%	78.97	7.62	(3.72	to	11.51)	<0.001
<b>Treatments selected</b>	<b>Yes</b>			<b>No</b>							
Manual Therapy	249	86.5%	84.19	39	13.5%	73.21	10.98	(5.28	to	16.68)	<0.001
Electrotherapy	57	19.8%	94.25	231	80.2%	79.85	14.39	(9.66	to	19.12)	<0.001
Stretching	151	52.4%	85.03	137	47.6%	80.13	4.9	(0.94	to	8.86)	0.02
Complementary	80	27.8%	84.58	208	72.2%	81.98	2.59	(-1.86	to	7.05)	0.25
Exercises	245	85.1%	81.43	43	14.9%	89.95	-8.52	(-14.04	to	-3.01)	0.003
<b>Advice given</b>	<b>Yes</b>			<b>No</b>							
Posture	198	68.8%	89.09	90	31.3%	68.64	20.45	(16.85	to	24.04)	<0.001
Back straight	107	37.2%	92.96	181	62.8%	76.64	16.33	(12.65	to	20)	<0.001
Avoid carrying weights	30	10.4%	91.50	258	89.6%	81.68	9.82	(3.38	to	16.26)	0.003
Resume flexion and rotation	204	70.8%	79.64	84	29.2%	90.14	-10.51	(-14.73	to	-6.28)	<0.001
Lift weights again	209	72.6%	79.74	79	27.4%	90.54	-10.81	(-15.11	to	-6.51)	<0.001

recommendations about postures and limiting movement. Holding these competing beliefs (e.g. movement is important but also avoid bending when lifting or carrying weights) may result in uncertainty about framing advice to patients. This is particularly important as the general population also holds similar competing beliefs of staying active while protecting the back (Christe et al., 2021b).

As hypothesized, physiotherapists with more unhelpful beliefs about LBP were those who recommended more back protection and avoidance. Specifically, beliefs about the vulnerability and the need to protect the back were all associated with a lower vignette score. Furthermore, advice about posture, lifting with straight back and avoiding carrying weights were all strongly associated with more unhelpful beliefs, with large differences in the Back-PAQ score (10–20 points). Conversely, advice to gradually load the back was associated with more helpful beliefs. These findings support that physiotherapists with more unhelpful beliefs provide more advice about protection, which reinforces the belief that the back is vulnerable (Nolan et al., 2018). Furthermore, physiotherapists who chose progressive exercises as a first treatment option had more helpful beliefs than the minority who did not, while selecting passive treatments was associated with a higher proportion of unhelpful beliefs. While previous research demonstrated that treatment orientation (e.g. biomedical) and fear avoidance beliefs were associated with clinical decisions (Gardner et al., 2017), our results indicate that physiotherapists' recommendations and advice are also influenced by their beliefs about their own back and LBP. Therefore, educational strategies that address these beliefs are needed as a precursor to enable effective implementation of LBP recommendations into clinical practice.

#### 4.4. Implications

In order to implement evidenced-based care, it is important to first challenge and address physiotherapists' own misconceptions about LBP (when present). Implementing guidelines may be very challenging when the recommendations do not make sense within physiotherapists' own belief system. Unhelpful beliefs about protection and vulnerability of the back should thus be targeted as a priority. This may necessitate an important shift in some historical aspects of physiotherapy, which has its roots in biomechanics and ergonomics. Furthermore, alongside changing their beliefs about the special nature of LBP, physiotherapists may need to consider a new role in the management of patients with LBP, as 'coaches' rather than 'treaters' in order to promote self-management (Buchbinder et al., 2018; O'Sullivan et al., 2018; Shaw and DeForge, 2012).

Future research should investigate the effect of educational approaches on physiotherapists' beliefs about LBP, and how these changes

affect LBP management in clinical practice. Qualitative research may inform the development of educational strategies by exploring how physiotherapists' beliefs translate into the choices they make about treatment and advice, and the ways in which they resolve competing contradictory beliefs or make sense of providing apparently discordant advice (such as advice to be active *and* protect the back).

#### 4.5. Study limitations

Clinical vignettes do not directly measure clinical behaviour and decisions. Nevertheless, they are considered reliable and valid to investigate clinical practice with a large number of participants (Evans et al., 2005; Peabody et al., 2000). Though the two questions added to the vignette were rated following the consistent opinions of LBP experts, their results should be considered as only indicative, as their measurement properties have not been previously established.

While the Back-PAQ questionnaire was developed through a rigorous process (Darlow et al., 2014a), it might not capture all the dimensions of physiotherapists' beliefs about LBP, as is possible in qualitative studies (Gardner et al., 2017). Though the themes of the Back-PAQ should not be considered as strictly independent concepts (Darlow et al., 2014a), the significant correlations between the vast majority of the Back-PAQ's items or the total score and clinical decisions support its use in future studies with health care professionals.

Some limitations are related to the recruited sample. The findings cannot be considered as representative of all Swiss physiotherapists, because only the French-speaking part of Switzerland was solicited. Furthermore, the use of non-probabilistic sampling method may have induced a self-selection bias and therefore may limit the generalization of the findings. It is also not possible to determine the number of physiotherapists that were reached by the questionnaire using this recruitment procedure and therefore the response rate. The sample size provided sufficient power to assess the association between physiotherapists' beliefs and clinical decisions. Based on the estimated number of practising physiotherapists in French-speaking Switzerland, estimates related to the prevalence of beliefs had an accuracy of  $\pm 5.5\%$ .

#### 5. Conclusion

While helpful beliefs and guidelines consistent decisions were generally present among French-speaking Swiss physiotherapists, unhelpful beliefs about the need to protect the back and the special nature of LBP were still common. Furthermore, unhelpful beliefs were associated with recommendations toward avoidance of movement, advice to protect the back and the selection of passive treatment strategies. It is

imperative that educational approaches are developed to help physiotherapists move toward helpful beliefs and recommendations, so that they can convey the best available knowledge to their patients. Future research should investigate the impact of these educational strategies on LBP management.

## Ethics

The Research Ethics Committee confirmed that the project could be conducted in accordance with Swiss ethical regulations.

## Declaration of competing interest

None.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.msksp.2021.102382>.

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