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## Original Article

## Beliefs about chronic low back pain amongst osteopaths registered in Spain: A cross-sectional survey

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## ABSTRACT

**Background:** Healthcare providers' (HCPs) attitudes and beliefs might influence patients' attitudes and beliefs as well as their management approach. It was hypothesised that osteopaths have a more biopsychosocial mindset towards chronic low back pain (CLBP) because of their holistic reasoning.

**Objective:** The primary aim of the study was to assess the beliefs of osteopaths registered in Spain about CLBP and the presence of kinesiophobic and fear-avoidance beliefs. The secondary aim was to compare these results with previous research and cut-off values.

**Method:** Members of the Spanish Federation of Osteopaths (FOE) were invited to participate in an online cross-sectional survey based on three questionnaires: the Health Care providers Pain and Impairment Relationship Scale (HC-PAIRS), the Tampa Scale of Kinesiophobia 11-item version for healthcare providers (TSK(11)-HC) and the Fear Avoidance Beliefs Questionnaire for healthcare providers (FABQ-HC). The mean scores were calculated for each questionnaire and correlations were established to assess the strength of the associations between the different instruments. The results were compared to previous research with other HCPs and to cut-off scores where available.

**Results:** The response rate was 14.58% (n = 70). The mean score on the HC-PAIRS was 59.44 ± 12.19 [CI 95% 56.54–62.35] and there was a large variation in scores. On the TSK(11)-HC and FABQ-HC 28.6% and 25.7% of the sample respectively reached the cut-off scores.

**Conclusion:** The study suggests that the Spanish osteopaths do not have a more biopsychosocial orientation towards the management of CLBP than other HCPs. Approximately a quarter of them hold kinesiophobic and fear-avoidance beliefs that might negatively influence their treatment approach.

## Introduction

Chronic low back pain is a highly prevalent and disabling condition with a huge impact on patients' lives, economies and healthcare systems [1,2]. Apart from a variety of biological contributors, psychosocial and contextual factors can play an important role in both the onset and the persistence of the CLBP process [3,4]. Two psychosocial factors that are considered strong predictors of poor treatment outcome are kinesiophobia and fear-avoidance beliefs [5,6]. Kinesiophobia is “an excessive, irrational and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or re-injury” [7]. Avoidance behaviour as a result of fearful beliefs about pain can significantly affect patients' daily life, social and professional activities [8].

The healthcare providers' attitudes and beliefs are features of the therapeutic context that can trigger placebo and nocebo effects [9].

Several studies have shown that HCPs' attitudes and beliefs are reflected in their patients' attitudes and beliefs and that they may influence their treatment approach, e. g. fear-avoidance beliefs and a strong belief in a structural cause of CLBP [10–12]. These erroneous beliefs, arising from a biomedical thinking, might result in poor compliance with the current best evidence regarding the management of low back pain [10,13–15].

Up to almost 25% of chronic pain patients make use of complementary manual therapies, including osteopathy [16–18]. Spinal complaints are the main reason why people visit an osteopath [19–21]. Osteopathy is considered to be largely in accordance with the biopsychosocial model, viewing pain as a disruptor of homeostasis, eliciting physiological, psychological and behavioural responses [22]. However, previous research has highlighted the lack of psychosocial assessment and management skills as well as the need to incorporate more active treatment modalities e.g. exercise prescription into osteopathic practice

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[23,24]. Furthermore, osteopaths in the United Kingdom do not seem to have a more biopsychosocial orientation towards the management of chronic pain conditions than other HCPs [25].

In Spain osteopathy is not yet a regulated profession although its popularity has increased significantly over the past decade. Because of the lack of legal regulation there exists a wide variety of educational programmes [19], not all of them compliant with international and European standards for osteopathic healthcare education. The osteopaths registered with the Spanish Federation of Osteopaths (FOE, Federación de Osteópatas de España) however, strictly have to meet these educational standards [26]. In addition, cultural differences seem to exist regarding attitudes and beliefs about pain. The cultural background of both HCPs and patients will affect their attitude towards a painful experience [27]. Kovacs et al. have shown that in various Spanish patient populations fear-avoidance beliefs have far less influence on low back pain and its related disability than in populations from Northern European and Anglo-Saxon countries. The authors attribute this to sociocultural characteristics [28,29]. Taking into account the educational standards and the cultural differences regarding pain-related fears, it was hypothesised that the osteopaths registered with the FOE would have a more biopsychosocial approach towards CLBP patients than other HCPs. The aim of this study was firstly to investigate the attitudes and beliefs of osteopaths registered in Spain towards the management of CLBP, including pain-related fears, and secondly to compare the results with previous studies and cut-off scores when applicable.

## Materials and methods

### Design

An online cross-sectional survey was conducted, based on the Spanish versions of the HC-PAIRS, the TSK(11)-HC and the FABQ-HC. The original English versions and the adapted Spanish versions can be found in Appendix 1. The survey was created with Google Forms [30]. A link was sent to the participants through their professional associations (Appendix 2). The identity and the contact details of the participants remained unknown to the investigators. The survey was accompanied by an introductory letter with details explaining the context and aim of the study, and the opportunity to contact the investigator for further clarifications if required.

The survey included an item that needed to be checked as explicit confirmation of giving informed consent to participate in the survey. The professional associations were contacted on February 20, 2019 and by February 25, 2019 they all confirmed their participation. Data collection took place for eight weeks between April 1, 2019 until May 26, 2019. After the first month a reminder was sent to potential participants. Only fully completed questionnaires could be sent back. The first completed survey was returned on April 3, 2019 and the last one on May 10, 2019.

The STROBE guidelines were used to report the survey [31].

The study was approved by the Research Committee for Scientific Ethical Questions (RCSEQ) from UMIT University and FHG Tyrol (University of Applied Sciences Tyrol) [32].

### Participants

Both practicing osteopaths registered with the Spanish Federation of Osteopaths (FOE, Federación de Osteópatas de España) and final year students of osteopathy schools associated with FOE member organisations were invited to participate in the study. The FOE comprises three professional associations whose members are required to meet the international and European standards as provided by the World Health Organisation (Benchmarks for Training in Osteopathy) and the CEN (Centre Européen de Normalisation) Standard for Osteopathic Healthcare Provision [33,34]: Registro de Osteópatas de España (ROE),

Asociación de Profesionales de Osteopatía (APREO) and Sociedad Europea de Medicina Osteopática (SEMO).

All 480 members of the FOE and final year students were invited by email. The aim was to reach a sample size of 126 to get a 7.5% margin of error with a 95% confidence level [35].

### Outcome measures

The sociodemographic data that were collected from the participants were gender, age and years of experience as an osteopath, as usually included, but not limited to, in other research [15,25,36]. Furthermore the participants were asked to specify the school where they studied osteopathy, but this was purely for informative reasons and was not used in the comparison of the results.

The primary outcome measure was the HC-PAIRS, the secondary outcome measures were the TSK(11)-HC and the FABQ-HC.

The decision to use these specific measurement tools was based on the existence of the Spanish versions, the previous use in similar investigations and the reported moderate to strong correlations between the different questionnaires [36,37].

#### HC-PAIRS: Health Care providers pain and relationship scale

The HC-PAIRS measures HCPs' beliefs towards the relationship between pain and impairment and predicts the nature of work and physical activity recommendations. The original PAIRS was adapted by Rainville et al. [38] for its use with HCPs. It is made up of 15 items that are scored on a 7-point Likert scale (1 = completely disagree, 7 = completely agree, reverse scoring for items 1, 6 and 14), scores ranging from 7 to 105. The adaptation replaced all first-person terms ("I") by the words "chronic low back pain patients". The internal consistency (Cronbach's alpha 0.84) and the validity of the HC-PAIRS are considered to be adequate [36].

Domenech et al. [37] translated the HC-PAIRS into Spanish and determined its psychometric properties. They concluded that it was a reliable (Cronbach's alpha 0.83) and valid tool that could be used to assess to which extent HCPs' attitudes and beliefs might affect their management of CLBP patients. High scores indicate the belief that LBP and disability are strongly related and point towards a more biomedical orientation towards CLBP management [36]. No cut-off scores have been established.

#### TSK(11)-HC: Tampa Scale of Kinesiophobia for Health Care providers, 11-item version

The original TSK was first adapted to be used with HCPs by Houben et al. [36]. An English version of the TSK-HC was later validated by Moran et al., but until today a validated Spanish version does not exist [39]. However, a Spanish version of the 11-item format, the TSK-11, is validated and considered a reliable tool for use in both acute (Cronbach's alpha 0.81) and chronic (Cronbach's alpha 0.79) patient populations [40]. For this survey, the Spanish version of the TSK-11 was adapted by the investigator in the same way that Houben et al. did with the original TSK. The first-person terms were replaced with third-person terms to look at the statements from the HCPs' point of view [36].

The 11 statements are scored on a 4-point Likert scale (1 = complete disagreement, 4 = complete agreement), scores ranging from 11 to 44. Higher scores indicate high levels of fear of movement. No specific cut-off scores have been determined. Several authors use the sample median as a cut-off point to separate low from high scores [41-43]. This could be problematic however because it makes the cut-off point sample-dependent. In a sample with a relatively low median score, this could lead to overestimation of kinesiophobic beliefs [44]. In this survey, to reduce the risk of overestimation, the 75th percentile value was chosen as the cut-off point to determine whether the scores represented higher levels of kinesiophobia.

**FABQ-HC: Fear Avoidance Beliefs Questionnaire for Health Care providers**

The FABQ-HC measures the HCPs' fear-avoidance beliefs regarding physical activity (PA) and work-related activities (W). Items 1 to 5 make up the PA-subscale and items 6 to 16 make up the W-subscale. It is scored on a 7-point Likert scale from zero to six (0 = completely disagree, 6 = completely agree). In the scoring items 2 to 5 are included in the PA-subscale with scores ranging from zero to 24 and items 6, 7, 9, 10, 11, 12 and 15 in the W-subscale with scores ranging from zero to 42.

The original FABQ, as designed by Waddell et al. [45], was adapted by Coudeyre et al. [46] for its use with HCPs by changing a sentence in the introduction of the questionnaire. In the sentence “*these are statements that other patients have expressed about their low back pain*” they deleted the word “*other*”. The FABQ has a Spanish version that was validated in a study by Kovacs et al. [47]. It was found to be a reliable (Cronbach's alpha 0.93) and easy to use tool. For this survey the investigator adapted the Spanish version in the same way the original FABQ was adapted by Coudeyre et al.

The cut-off scores are established at > 14 on the PA-subscale and > 34 on the W-subscale [46,48]. Scores above the cut-off values indicate high levels of physical activity and/or work-related fear avoidance beliefs.

**Statistics**

For the primary objective, the individual scores of the three questionnaires were imported into an Excel file (Microsoft® Excel for Mac, version 16.16.5) and the results for each participant were calculated. The mean score, standard deviation and confidence interval were calculated for each questionnaire. Pearson correlation coefficients were used to assess the strength of the associations between the scores on the different questionnaires. The distribution of the sociodemographic data was obtained directly from the Google Form document. In the subsection “years of experience” the mean and standard deviation of the entire professional group, without the students, were also calculated. The scores of “men vs. women” and “professionals vs. students” were compared with unpaired *t*-tests [49]. The results of the different age groups and the different “years of experience” groups were compared using a one-way ANOVA test [50].

For the secondary objective, the results of the HC-PAIRS were compared to the results from previous studies. Only studies that used the same version of the HC-PAIRS instrument (15 items, 1–7 Likert scale, score 15–105) were included, since modified versions also exist. The studies included physiotherapy, osteopathy, nursing and medical students and professional physiotherapists, physicians, osteopaths, nurses and occupational therapists [25,37,38,51–62]. The results of the TSK(11)-HC and the FABQ-HC were compared to cut-off scores and to the results from previous studies with other HCPs, including elder care workers, rheumatologists and general practitioners, as well as physiotherapy, medical and nursing students [46,62–66]. When applicable, the results were represented in a diagram for graphical comparison. The FABQ scores from different studies were compared with the result from the present study by means of a one-way ANOVA test using summary data [67]. In case there were specific studies to compare with, an unpaired *t*-test was performed. In the MacDonald study the mean HC-PAIRS score was represented as the mean with the confidence interval, without mentioning the standard deviation [25]. In order to compare the mean HC-PAIRS score of the present study to that of the MacDonald study, the standard deviation needed to be calculated from the confidence interval according to the instructions from the Cochrane Handbook 5.1 [68].

**Results**

Out of the 480 osteopaths who were invited to participate, 70 returned the completed survey and were included for analysis. This is a

**Table 1**  
Sociodemographic characteristics.

	%	n
Gender		
Male	51.4%	36
Female	48.6%	34
Age		
< 25 y	4.3%	3
25–40 y	54.3%	38
41–55 y	37.1%	26
> 55 y	4.3%	3
Years of experience		
Students	20%	14
< 5 y	22.9%	16
5–10 y	22.9%	16
11–20 y	30%	21
> 20 y	4.3%	3
Country of training		
Spain	83%	58
United Kingdom	8.6%	6
France	7.1%	5
Portugal	1.4%	1

response rate of 14.58%. With a confidence level of 95%, this results in a margin of error of 10.84% [35].

The sociodemographic data of the participants are represented in Table 1. The subjects studied in or graduated from schools in Spain, France, the United Kingdom and Portugal. The various schools are listed alphabetically in Appendix 3.

The overall mean score ( $\pm$  Standard Deviation) on the HC-PAIRS was 59.44  $\pm$  12.19 [CI95% 56.54–62.35]. Scores ranged from 29 to 86 on a 15–105 scale.

The overall mean score on the TSK(11)-HC was 24.11  $\pm$  6.24 [CI95% 22.63–25.60] and scores ranged from 11 to 41 on a 11–44 scale.

The overall mean score on the PA-subscale of the FABQ-HC in this study was 10.69  $\pm$  5.43 [CI95% 9.39–11.98]. Scores ranged from 0 to 20 on a 0–24 scale.

The overall mean score on the W-subscale of the FABQ-HC was 22.29  $\pm$  7.35 [CI95% 20.53–24.04]. Scores ranged from 0 to 36 on a 0–42 scale.

No significant differences were found between the mean scores of the sociodemographic subgroups, for any of the three questionnaires (Table 2).

Pearson correlation coefficients were calculated in Excel (Microsoft® Excel for Mac, version 16.16.5). Five out of the six were considered moderate to strong correlations [69]. See Table 3 for the correlations between the scores on the different questionnaires.

The mean HC-PAIRS score was compared using an unpaired *t*-test to the mean score of the sample of UK registered osteopaths obtained in the MacDonald et al. study (25). The difference of means was 3.49 [CI 95% 0.5–6.48] ( $p = 0.0222$ ). The rest of the samples were compared with a one-way ANOVA test using the summary data. This showed that three groups of physiotherapy students and one group of nursing students scored significantly higher than the present sample. Seven samples including general practitioners, physiotherapists, nurses as well as physiotherapy and medical students obtained comparable scores. Nine samples scored significantly lower, including the sample of UK registered osteopaths. The comparison with previous studies involving other HCPs is graphically represented in Fig. 1.

The 75th percentile cut-off value on the TSK(11)-HC was 29. Twenty participants (28.6%) scored 29 or higher. Tsuboi et al. used the TSK(11) to evaluate a sample of 505 Japanese elder care workers with LBP (63). The mean score was 22.4  $\pm$  5.3. Comparing the mean score of the present study to the mean score of Tsuboi's study resulted in a difference of means of 1.71 [CI 95% 0.35–3.07] ( $p = 0.014$ ).

Eighteen participants (25.7%) scored higher than the cut-off score

**Table 2**  
Comparison scores per sociodemographic variable.

	HC-PAIRS (mean ± SD)	TSK-HC (mean ± SD)	FABQ-PA (mean ± SD)	FABQ-W (mean ± SD)
<i>Gender</i>				
Men	58,78 ± 12,18	23,56 ± 6,98	11,17 ± 6,02	21,08 ± 8,88
Women	60,15 ± 12,35	24,71 ± 5,39	10,18 ± 4,76	23,56 ± 5,09
Unpaired <i>t</i> -test	<b>P = 0,642</b>	<b>P = 0,445</b>	<b>P = 0,450</b>	<b>P = 0,160</b>
<i>Age (years)</i>				
< 25	67,67 ± 5,51	28,33 ± 2,08	9,67 ± 5,86	25,33 ± 7,09
25–40	58 ± 11,86	24,58 ± 5,87	10,84 ± 4,55	22,74 ± 6,93
41–55	60,42 ± 13,63	22,88 ± 7,08	10,27 ± 6,79	21,23 ± 8,44
> 55	61 ± 4,36	24,67 ± 5,03	13,33 ± 3,06	22,67 ± 0,58
One-Way ANOVA	<b>P = 0,558</b>	<b>P = 0,463</b>	<b>P = 0,807</b>	<b>P = 0,760</b>
<i>Years of experience</i>				
Student	57,71 ± 7,67	24,29 ± 5,15	10,07 ± 4,5	22,43 ± 6,94
< 5	62,06 ± 14,36	23,69 ± 6,13	9,44 ± 4,56	22,75 ± 8,02
5–10	59,75 ± 14,49	26,06 ± 7,42	11,94 ± 5,41	22,25 ± 7,65
11–20	58,14 ± 12,28	22,76 ± 6,32	10,71 ± 6,8	21,81 ± 7,9
> 20	61 ± 4,36	24,67 ± 5,03	13,33 ± 3,06	22,67 ± 0,58
One-Way ANOVA	<b>P = 0,866</b>	<b>P = 0,629</b>	<b>P = 0,640</b>	<b>P = 0,997</b>
<i>Years of experience</i>				
Student	57,71 ± 7,67	24,29 ± 5,15	10,07 ± 4,5	22,43 ± 6,94
Professionals	59,88 ± 13,10	24,07 ± 6,53	10,84 ± 5,66	22,25 ± 7,51
Unpaired <i>t</i> -test	<b>P = 0,555</b>	<b>P = 0,907</b>	<b>P = 0,638</b>	<b>P = 0,935</b>

**Table 3**  
Pearson correlation coefficients.

Questionnaires	r	p
HC-PAIRS/TSK(11)-HC	0.60	< .00001
HC-PAIRS/FABQ-PA	0.45	.000113
HC-PAIRS/FABQ-W	0.35	.002643
TSK(11)-HC/FABQ-PA	0.62	< .00001
TSK(11)-HC/FABQ-W	0.54	< .00001
FABQ-PA/FABQ-W	0.68	< .00001

of > 14 on the PA-subscale of the FABQ-HC. The analysis of variance shows that the present sample scored significantly lower than a group of nursing students ( $p = 0.0016$ ) and a group of physiotherapy students ( $p = 0.0003$ ) [62,64]. Compared to the results of the remaining studies the score of the present sample was not significantly different. The graphical comparison with the scores of other HCPs is shown in Fig. 2.

Three participants (4.29%) reached the cut-off score of > 34 on the FABQ-HC W-subscale. A one-way ANOVA test was performed using the summary data and showed that the present sample obtained significantly higher scores ( $p < 0.0001$ ) than the general practitioners and rheumatologists from the Coudeyre et al. and Poiraudau et al. studies respectively, but not significantly different ( $p = 0.23$ ) from the sample of Spanish physiotherapy students that participated in the Domenech et al. study [46,64,66]. Fig. 3 shows the graphical comparison to previous studies.

## Discussion

This study evaluated the treatment orientation of osteopaths

registered in Spain towards the management of CLBP and the presence of pain-related fears. The mean score on the HC-PAIRS was comparable or significantly higher than that of most of the previous studies [25,37,38,51–62]. On the TSK(11)-HC and FABQ-HC PA-subscale a quarter of the participants scored higher than the cut-off value. All scores ranged widely.

Gender, age and years of experience didn't have a significant impact on the scores obtained on the three questionnaires. Furthermore, when comparing the results from the final year osteopathy students to the results of the osteopathic professionals, no statistically significant differences were found.

### Interpretation of the scores and comparison to previous research

Higher scores on the HC-PAIRS suggest a more biomedical orientation towards CLBP. The comparison of the results with previous studies confirms the findings of MacDonald et al. and indicates that osteopaths do not have a more biopsychosocial orientation towards CLBP than other HCPs. So although theoretically osteopathy shows coherence with the principles of the biopsychosocial model [22], this does not translate into practice. This finding is consistent with previous studies that demonstrated that osteopaths find it challenging to implement the biopsychosocial model into osteopathic practice [70,71]. This is also reflected in the low adherence to clinical practice guidelines [72,73]. A predominantly biomedical focus might be at the base of the modest treatment results of osteopathic care for CLBP and might also explain the limited effect of osteopathic treatment on psychosocial factors [74,75]. As a reaction to The Lancet series on low back pain, Fitzgerald et al. critically reflected on the osteopathic profession [76].

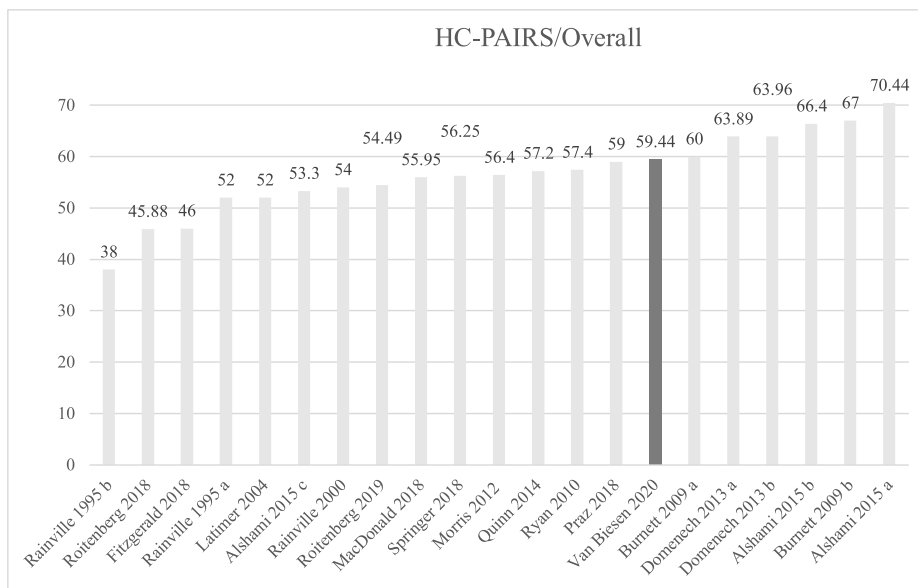


Fig. 1. HC-PAIRS scores from previous research.

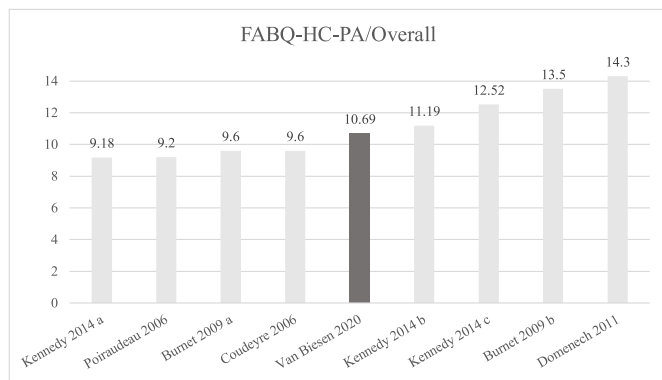


Fig. 2. FABQ-HC-PA scores from previous research.

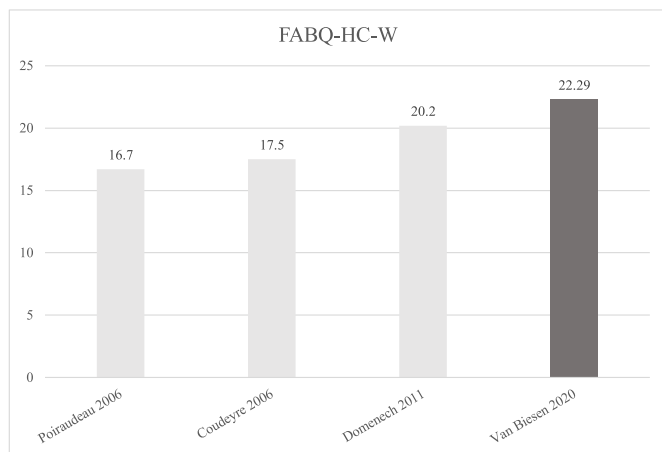


Fig. 3. FABQ-HC-W scores from previous research.

The authors concluded that osteopaths will have to make greater efforts to be compliant with the clinical practice guidelines to assure their role in the multidisciplinary management team of CLBP patients.

28.6% of the sample is considered to present with high levels of kinesiophobic beliefs. It could be said that over a quarter of the Spanish osteopaths are convinced that physical activities might increase pain levels and result in more damage to the spine in CLBP patients. This

might be due to the fact that a significant proportion of osteopaths still believe in a clear relationship between tissue damage and LBP [77]. For comparison with previous research, only one study was found that used the same TSK-11 version as was used in the present study. Although statistically significant, it is unlikely that the difference of 1.71 points between the two mean scores is meaningful since Woby et al. suggested a minimal difference of four points on the TSK-11 to be clinically relevant [78].

Similarly, the results of the FABQ-HC PA-subscale suggest that a quarter of the Spanish osteopaths believe that avoiding physically demanding activities is beneficial for the recovery of back pain. Only Coudeyre et al. and Poiraudeau et al. calculated the percentage of subjects that reached the > 14 cut-off value, being 16% and 10% respectively [46,66]. The proportion of participants in the present study showing high levels of fear-avoidance beliefs about physical activities is substantially higher than that of the aforementioned studies.

Physical activity was regarded as threatening for low back pain patients by a significant proportion of the participants. This is in direct contradiction to the clinical practice guidelines for the treatment of CLBP [79–81]. The lack of specific education on pain in undergraduate programmes at osteopathic and other healthcare faculties likely plays a role here [70,82]. A better knowledge of pain neuroscience is associated with a more biopsychosocial approach to chronic pain and more efficient pain management [57,83,84]. Several authors have made suggestions to better implement findings from modern pain science into the osteopathic clinical practice [85,86]. This includes, but is not limited to, taking into consideration different pain mechanisms, assessment of psychosocial factors, evidence based patient education, the use of appropriate language and an active role for the patient [85,86].

Only a minority of the participants seems to have problematic beliefs about work-related activities. This is considered positive since continuing or returning quickly to work is recommended in the clinical practice guidelines for CLBP [87]. None of the previous studies contains data on the percentage of subjects that scored higher than 34 on the W-subscale.

The correlations between the scores of the different questionnaires are consistent with previous research. Houben et al. found a moderate to strong correlation between the HC-PAIRS and the TSK-HC scores and Domenech et al. reported that the HC-PAIRS score is more strongly correlated with the FABQ-PA subscale than with the FABQ-W subscale [36,37].

Participants with higher levels of fearful beliefs regarding physical

activity obtained higher scores on the HC-PAIRS, indicating a more biomedical orientation towards CLBP management. This might affect the treatment approach and the advice that is given to the patients.

The results of this survey should not be generalised to the entire Spanish osteopathic profession. The FOE represents only a proportion of the osteopathic professionals who are active in Spain. The membership of FOE ensures the compliance with the highest educational standards and official representation at European level through the European Federation & Forum for Osteopathy.

### Limitations

The conducted survey has several limitations. The response rate, however comparable to that of previous online surveys [25,77,88], was lower than expected and this resulted in a larger margin of error of 10.84%, versus the proposed 7.5%. This might be due to the limited time of data collection and the fact that there was no direct contact between the investigators and the participants. After one month the professional associations were asked to send a reminder to their members to encourage more osteopaths to complete the survey. Only one association confirmed to have sent a reminder. It is uncertain if the other two have complied with the request.

The population from which the sample was taken is not representative of the entire osteopathic collective in Spain. Other professional osteopathic associations exist which members are not required to meet the European educational standards [89].

Although previous research has shown an association between HCPs' attitudes and beliefs and the treatment approach they take [46,58,90], the three questionnaires that were used in this survey do not inform about the actual treatment choices that would be made in real life clinical situations. Including patient vignettes that describe a hypothetical patient situation similar to what Rainville et al. did, could offer more insight into the influence of the HCPs' treatment orientation and back pain beliefs on their actual clinical decision making [38,59], keeping in mind that several authors have demonstrated differences in the validity of patient vignettes, depending on the research setting [91,92].

Of the three questionnaires that were chosen for this study, to be used in a Spanish HCP population, only one, the HC-PAIRS, has a formally validated Spanish version [37]. The Spanish versions of the TSK-11 and the FABQ, both validated questionnaires [40,47], were adapted by the first author in the same way the original TSK and FABQ were adapted for their use with HCPs, but the psychometric properties were not evaluated.

Finally, the number of studies that used similar TSK and FABQ versions was very limited which made a robust comparison with other HCPs not possible.

### Future implications

The great variety in osteopathic training programmes available in Spain, together with the lack of regulation and quality control make it necessary to further investigate on a larger scale the treatment orientation of Spanish osteopaths towards CLBP. Additionally, treatment approaches taken in the management of other common acute and chronic conditions should be explored to ensure that the best possible care is offered, i. e. adherence to clinical practice guidelines, and patients' safety is guaranteed.

The use of patient vignettes, including clinical and osteopathic features, could be considered because this might give a more accurate reflection of the clinical decision-making process applied by the osteopaths, however, conflicting opinions exist regarding this subject [93].

Specific educational modules on pain should be carefully designed and delivered, as the effect they have on HCPs' attitudes and beliefs about pain can vary [52,54,94].

### Conclusion

The results of the study suggest that the Spanish osteopaths do not hold a more biopsychosocial orientation towards CLBP than other healthcare professionals. Over a quarter of them might have high levels of kinesiphobic beliefs and physical activity-related fear-avoidance beliefs that could negatively affect their treatment approach and adherence to clinical practice guidelines.

Undergraduate and postgraduate modules on specific pain knowledge should be considered to increase the awareness of the biopsychosocial nature of pain and to reduce biomedical reasoning when working with chronic pain patients.

### Additional information

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

### Declaration of competing interest

We have no conflicts of interest to declare.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijosm.2020.03.002>.

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