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# Adaptation of the person centered therapeutic relationship patient version (PCTR-PT) to a version for physiotherapists (PCTR-PHYS) and evaluation of its psychometric properties

Óscar Rodríguez-Nogueira[1] | Jaume Morera Balaguer[2] | Abel Nogueira López[3] | Juan Roldán Merino[4] | Víctor Zamora-Conesa[2] | Antonio R. Moreno-Poyato[5,6]

[1]Department of Nursing and Physiotherapy, SALBIS Research Group, Universidad de León, Ponferrada, León, Spain

[2]Physical Therapy Department, CEU Universities, Universidad Cardenal Herrera-CEU, Alicante, Spain

[3]Department of Physical Education and Sports, Universidad de León, León, Spain

[4]Campus Docent Sant Joan de Déu-Fundació Privada, School of Nursing, University of Barcelona, Barcelona, Spain

[5]Mental health, psychosocial and complex nursing care research group (NURSEARCH), Barcelona, Spain

[6]Facultat de Medicina i Ciències de la Salut, Escola d´Infermeria Departament d'Infermeria de Salut Pública, Salut Mental I Materno Infantil, Universitat de Barcelona, Barcelona, Spain

**Correspondence**

Óscar Rodríguez-Nogueira, Department of Nursing and Physiotherapy, SALBIS Research Group, Universidad de León, Campus de Ponferrada, Av. Astorga, 15, Ponferrada, León 24401, Spain.
Email: orodn@unileon.es

## Abstract

**Background and Purpose:** The therapeutic relationship is a central component for developing person-centered care within physiotherapy services. However, it is necessary to understand how this relationship is perceived by both parties involved. The Person Centered Therapeutic Relationship-Patient scale (PCTR-PT) was constructed to identify patients' perceptions. No instruments are currently available to correlate patients' and physiotherapists' perceptions of the therapeutic relationship. This study sought to adapt the PCTR-PT to develop a version for physiotherapists, the Person Centered Therapeutic Relationship Scale for Physiotherapists (PCTR-PHYS) and to determine its psychometric properties.

**Methods:** A three-stage study was performed: (1) item generation, (2) pretesting of the questionnaire, (3) analysis of psychometric properties. Factor validity and psychometric properties were analyzed by confirmatory factor analysis (CFA). Convergent validity was calculated. Internal consistency was verified using the Cronbach's alpha coefficient. The intraclass correlation coefficient (ICC) was used to examine temporal stability.

**Results:** Thirty-three physiotherapists participated in two rounds of cognitive interviews and 343 participated in the analysis of psychometric properties. The CFA confirmed the four-structure model. Reliability of the tool was confirmed by Cronbach's alpha ($\alpha = 0.863$) for all four dimensions, as all were above 0.70, ranging from 0.704 (relational bond) and 0.898 (therapeutic communication). Test-retest was performed with 2-week intervals, indicating an appropriate stability for the scale (ICC = 0.908).

**Discussion:** The Person Centered Therapeutic Relationship Scale for Physiotherapists is a useful, valid and applicable instrument to evaluate the person-centered therapeutic relationship during physiotherapy interventions. It will enable the comparison of patients' and physiotherapists' perceptions. To provide person-centered care in physiotherapy services, there is a clear need to incorporate

specific resources into clinical practice to evaluate the quality of the therapeutic relationship from the perspective of both the persons being treated and the professionals providing care.

**KEYWORDS**
assessment, communication, person centered care, physical therapy specialty, therapeutic alliance, therapeutic relationship

## 1 | INTRODUCTION

Person-centered care refers to a holistic approach to provide respectful and individualized care based on a therapeutic relationship between all care providers and individuals who are empowered to be involved in their health care decisions (Morgan & Yoder, 2012). Person-centered care is a goal (Wagner et al., 2005) and a quality standard in clinical practice (Sidani & Fox, 2014). Its implementation is a priority for improving health care (Institute of Medicine, 2001). According to the World Health Organization (2018), the comprehensive needs of individuals, and not just diseases, should be at the center of health systems. Thus, professionals must empower individuals to play a more active role in their own health. In addition, relational aspects, individualization of care, empowerment, and the sharing of roles and responsibilities through the therapeutic alliance are important for carrying out person-centered care (Mead & Bower, 2000; Morgan & Yoder, 2012; Scholl et al., 2014). Therefore, in order to develop person-centered care in physiotherapy, it is necessary to establish an appropriate therapeutic relationship between the professional and the person receiving care (Rodríguez-Nogueira, Botella-Rico, et al., 2020).

The therapeutic relationship in physiotherapy can be defined as the safe relational space and affective bond between the patient and the professional, where connections are established and collaborative work takes place in terms of treatment and objectives (McCabe et al., 2021). The therapeutic relationship is beginning to be considered within physiotherapy treatments for its contribution to improved clinical outcomes (Holmes et al., 2022; Kinney et al., 2020).

Despite the importance of the therapeutic relationship within person-centered care, in the context of physiotherapy, assessment of the same is difficult. This is because of the lack of appropriate instruments to measure the specific characteristics of physiotherapy procedures (Miciak et al., 2018; Morera-Balaguer et al., 2021). The inability to evaluate this relationship makes it difficult to establish actions aimed at improving it.

For this reason, Rodríguez-Nogueira, Botella-Rico, et al. (2020) carried out the construction and content validation of the Person-Centered Therapeutic Relationship Scale for Physiotherapists (PCTR-PT) psychometric properties were determined (Rodríguez-Nogueira, Morera Balaguer, et al., 2020). This scale, specific to physiotherapy services, was designed to measure the experiences of rehabilitation patients. These experiences are useful for understanding how a participant interprets or evaluates the clinical interaction (Street & Mazor, 2017). It consists of 15 items and four dimensions (Relational Bond [RB], Individualized Partnership [IP], Professional Empowerment [PE], and Therapeutic Communication [TC]), explaining 78.4% of the variance of the total variables. The variance not explained could be due to factors such as the environment or personal characteristics of the physiotherapist that seem to influence the therapeutic relationship (Morera-Balaguer et al., 2018, 2021). The reliability of the tool was approved by Cronbach's alpha in the four dimensions, since all are above 0.70, ranging from 0.84 (IP) to 0.91 (PE).

To our knowledge, the PCTR-PT was the first scale created to measure the person-centered therapeutic relationship in physiotherapy settings. Another scale exists, the Physiotherapy Therapeutic Relationship Measure (McCabe et al., 2021) designed to measure patients' experiences of their therapeutic relationship with physiotherapists.

The therapeutic relationship has been defined as "the feelings and attitudes that each participant has toward the other and the manner in which these are expressed" (Gelso & Carter, 2016). It is considered as a subjective phenomenon that occurs between two individuals (the patient and the physiotherapist) (Street & Mazor, 2017). This indicates the need to consider the experiences and perceptions of the two actors involved in the relationship, that is, the patient and the physiotherapist (Bachelor, 2013).

There seems to be a low association between the perceptions of the actors involved in the therapeutic relationship (Tryon et al., 2007), additionally, a high concordance is associated with positive results and a low concordance is associated with stress and poor results (Bachelor, 2013).

Considering the importance of the therapeutic relationship in physiotherapy services, and the need to have information to collate the perceptions of patients and physiotherapists, the aim of the present study was to adapt the PCTR-PT to a version for physiotherapists (PCTR-PHYS) and to determine the psychometric properties of this version.

## 2 | METHODS

To adapt the PCTR-PT (Rodríguez-Nogueira, Botella-Rico, et al., 2020; Rodríguez-Nogueira, Morera Balaguer, et al., 2020) patient version to the version for physiotherapists (PCTR-PHYS), it was necessary to adapt the scale to the population of physiotherapy professionals. For this purpose, this study was conducted in three stages (Figure 1): (1) item generation, (2) pretesting of the

questionnaire, (3) assessment of the psychometric properties of the instrument.

## 2.1 | Stage 1. Item generation

According to Bachelor (2013), to develop an instrument to measure therapist experiences of the quality of the therapeutic relationship, the same scale structure of the instrument can be used as the patient-reported version, since the goal is to compare experiences of both participants in the therapeutic relationship. Because of this, four researchers (ORN, JMB, ARMP, VZC) independently revised the original version of the PCTR-PT, and each developed a new version aimed at physiotherapists while maintaining the four dimensions of the original instrument. The four reviewers were physiotherapists with practical and academic experience in the study of the therapeutic relationship, with the aim of meeting the first of the International Test Commission guidelines (Hernández et al., 2020) for the adaptation of questionnaires (ensuring that the adaptation process considered the linguistic and cultural differences between the populations to which the adapted versions of the test are addressed). For each of the items, physiotherapists were asked about their perceptions of their own actions and behaviors. The four versions were compared and the researchers agreed on a preliminary version. It was agreed that the item would be definitive when a minimum of 75% agreement was reached among the four participants (Finger et al., 2006; Hamilton et al., 2018).

## 2.2 | Stage 2. Pre-testing of the questionnaire

With the preliminary version obtained after the stage 1, a cognitive pre-test was performed, with the following objectives: (1) To evaluate the understanding of the items and of the response options; (2) To evaluate the clarity of the language and format; (3) To evaluate the appropriateness and relevance of the content and the possible lack of aspects that were not initially considered; (4) To review any problems related to the order of questions or any interactions among the same; (5) To examine the perception of length or overall burden of the assessment tool.

Individual interviews were conducted using the probing based paradigm, in which the inter viewer proactively guides the interaction, asking questions and using probing questions (Willis, 2005). For this purpose, retrospective probing (Willis, 2005) was used, where the participant responds to the complete questionnaire after which the interview takes place. Three physiotherapists (ORN, JMB, VZC), members of the research team with experience as interviewers, conducted the interviews. There was a consensus meeting on the strategies to use in the interview (asking what the person had understood from the question or asking the participant to restate the questions using different wording). The researchers began by informing the participant of the study aim and provided an informed consent for the participant to sign. The participant subsequently completed the questionnaire. The participant was informed beforehand not to ask the researcher the meaning of any question. Should any participant have a query, they were asked to write the same in a blank text box included in the questionnaire. All interviews were recorded and transcribed verbatim.

### 2.2.1 | Settings and participants

The following selection criteria was established: (1) physiotherapists who were currently working in a physiotherapy service; (2) physiotherapists who had worked at least 15 days in their current work center.

The participants were recruited from two hospitals within the Spanish public health system (Elche, Vinalopó), six private physiotherapy centers (Alicante, Orense, León), and two Universities

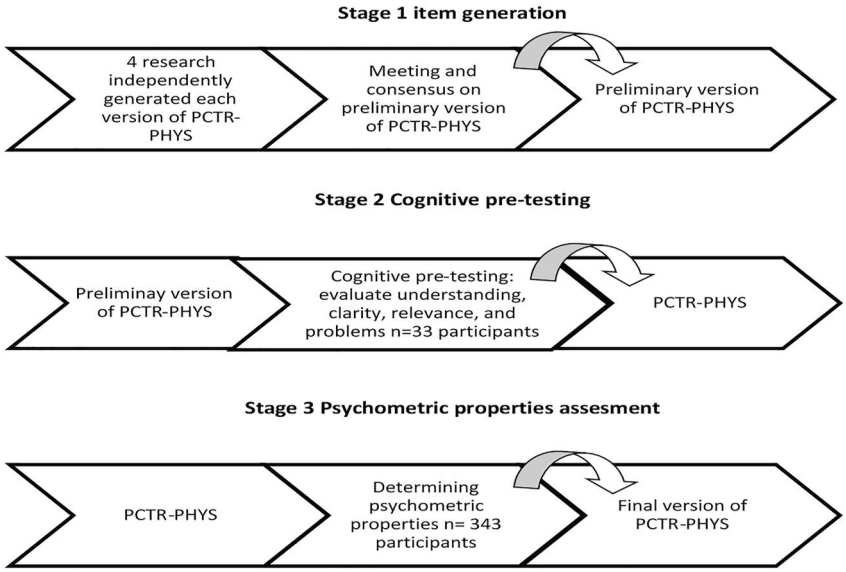


**FIGURE 1** Study stages.

(Cardenal Herrera CEU, Universidad deLeón), using convenience sampling methods.

### 2.2.2 | Data analysis

Two researchers (ORN and JMB) analyzed the participants' responses and coded any possible problems. For this purpose, a coding system was created, which corresponded with the four stages of the question-response process of CASM (Schwarz, 2007), adding a category related to instrument logic (Supporting Information S1: Appendix A). Subsequently, the research team (ORN, JMB, ARMP, VZC), met, discussed, and reached an agreement by consensus on whether to keep, modify, or remove each potentially defective item. Any potential problems were addressed from both a quantitative point of view (items with a frequency of acceptance below 85% required revision) as well as a qualitative point of view. This collaborative approach sought to eliminate the potential bias of a single researcher's perspective.

## 2.3 | Stage 3. Analysis of psychometric properties

In this phase, the selection criteria were the same that in stage 2. An online cross-sectional survey of Spanish physiotherapists was conducted. Google Docs platform was used to create the survey, activating the option of one response per user to avoid duplicate responses. The electronic form included a questionnaire with the physiotherapists' sociodemographic and professional data and the physiotherapist-adapted version of the PCTR-PHYS. To distribute the questionnaire, we contacted various institutions involving physiotherapists (professional associations, public and private health centers) as well as personal contacts of the researchers.

### 2.3.1 | Statistical analysis

To evaluate and conceptualize the demographic characteristics of the professionals in the sample, the following analyses were performed.

### 2.3.2 | Construct validity

The factor structure of the scale, the number of subscales or dimensions and the total number of items, was verified by performing an exploratory factor analysis of the instrument. To do so, the recommendations of Lorenzo-Seva were followed (Lorenzo-Seva, 1999) using the generalized least squares method for extraction and the oblique rotation method (promin), in order to maximize the simplicity of the factors. In addition, we obtained the values of the Kaiser-Meyer-Olkin index (KMO) and Bartlett's sphericity test ($\chi^2$).

The factorial validity, goodness of fit and psychometric properties of the scale were analyzed by confirmatory factor analysis (CFA) using the generalized least squares method, which has the same properties as the maximum likelihood method but under less rigorous multivariate normality considerations, being used mainly for items of ordinal measurement level (Batista-Foguet et al., 2004), which allows robust calculation of the factor structure in terms of fit.

To determine the quality of the overall fit of the factorial model, the selected indexes and their corresponding values were established according to those proposed by Marôco (2014) these being: Normalized Chi-square, defined as the ratio of the Chi-square value to the number of degrees of freedom ($\chi^2$/df), root mean square error of approximation (RMSEA), root mean square error index (RMR), Tucker-Lewis index (TLI), comparative fit index (CFI), goodness-of-fit index (GFI), and standardized root mean square residual (SRMR). Thus, values below 0.08 are considered acceptable, and those equal to or below 0.05 excellent for the RMSEA, RMR and SRMR indices. Regarding TLI, CFI and GFI, results above 0.90 or 0.95 are interpreted as a good fit to the data; while to establish a correct model it is necessary for the relationship $\chi^2$/df to be $<$ than 3 (Hauck-Filho & Valentini, 2020; Schermelleh-Engel et al., 2003)

### 2.3.3 | Convergent validity

This was carried out through the Average Variance Extracted (AVE), which is considered adequate if a value greater than 0.50 is obtained (Hair et al., 2018; Ramos et al., 2018).

### 2.3.4 | Internal consistency

Cronbach's alpha coefficient was the index selected to verify internal consistency, both for the complete scale and for each of the subscales, establishing as acceptable all values equal to or greater than 0.70 (Hu & Bentler, 1999). In addition, the composite construct reliability value was also calculated, for which values above or equal to 0.70 are associated with good internal consistency (Bagozzi & Yi, 1988; Hair et al., 2018).

### 2.3.5 | Temporal stability or test-retest

The temporal stability of the instrument was tested by administering the questionnaire to a subsample of $n = 75$ participants obtained from the initial sample. This new data collection was carried out 2 weeks after the first collection. The intraclass correlation coefficient (ICC) was used to verify the aforementioned stability, according to the two-way mixed method and taking as values of acceptable reliability those between 0.70 and 0.80; good for values between 0.80 and 0.90 and those above 0.90 as reflecting excellent reliability (Fleiss, 2011; Terwee et al., 2007).

AMOS statistical software (v. 26, SPSS, An IBM Company) and EQS (Multivariate Software, Inc.) were used to carry out the analyses.

### 2.3.6 | Ethical considerations

All participants granted consent in stage 2 and 3 of the study. Participants provided informed written consent and indicated whether they wanted to be explicitly acknowledged in this paper. This study was approved by the Ethics Committee of the University of León.

## 3 | RESULTS

### 3.1 | Stage 1. Item generation

The participants in the adaptation of the scale items were 4 physiotherapists, all male with an average age of 47.5 years, an average of 16.5 years of clinical practice and 12.22 years of university teaching practice. The four doctors, two of them in the field of therapeutic relationship and other in the field of construction and validation of scales. A meeting was held via meet to compare and agree on the final version. A 100% agreement was reached on 14 items in the first round. Only on the item "*I make my patient believe that he/she has the ability to cope with his/her own effort*" there was 50% agreement, so it had to be discussed in depth. After discussion, 100% agreement was reached and the item was finally agreed: "*I help my patient to believe in his ability to improve with his own qualities.*"

### 3.2 | Stage 2. Pretesting of questionnaire

Two rounds of cognitive interviews were performed with the preliminary version of the scale involving 33 participants ($n$ = 21 in the first round and $n$ = 12 in the second round). The participants were 17 men and 16 women with an average age of 39 years and an average of 18 years of professional experience as physiotherapists. Of these, 69.7% worked in private clinics and 57.6% worked with trauma patients. A table with the sociodemographic characteristics of the sample used in the study is shown below (Table 1).

Each interview lasted between 24 and 66 min. The mean time that participants took to complete the questionnaire was 2 min 58 s (1 min the fastest and 5 min and 47 s the slowest). The perceived length of the same was deemed appropriate for all participants (100%). The mean perceived difficulty of the questionnaire was 2 (0 = very easy; 10 = very difficult).

The qualitative analysis of the interviews revealed potential problems affecting nine items during the first round, and six items during the second round. These concerned the statement of the items. Thus, 57 potential problems were detected in the first round, and eight in the second round (the results of the cognitive pretest can be consulted in Supporting Information S1: Appendix B).

After the analysis of the first round, three items were reformulated, based on the problems encountered and after discussion and consensus among four members of the research team (ORN, JMB, ARMP, VZC). With the refined questionnaire, a second round of cognitive interviews was performed. In this second round, all the items fulfilled the quantitative acceptance criteria, no important potential problem was detected from the qualitative point of view and there were no new suggestions, neither were there any potential problems in the format of the document or with the order of the questions.

The final tool includes 15 items divided into four domains. The response format is based on a 5-point Likert frequency scale. Response options range from "strongly agree" to "strongly disagree."

**TABLE 1** Sociodemographic characteristics of participants' pre-cognitive test.

| Sex | *N*° % |
|---|---|
| Male | 17–51.5 |
| Female | 16–48.5 |
| Age (years) | *n* % |
| 21–31 | 7–21.2 |
| 31–41 | 13–39.4 |
| 41–51 | 10–30.3 |
| 51–62 | 3–9.1 |
| Mean (years) | 39 |
| Professional experience (years) | *n* % |
| 1–11 | 8–24.2 |
| 12–22 | 19–57.6 |
| 23–33 | 3–9.1 |
| 34–44 | 3–9.1 |
| Mean (years) | 18.08 |
| Hospital type | *n* % |
| Public | 10–30.3 |
| Private | 23–69.7 |
| Pathology | *n* % |
| Traumatology | 19–57.6 |
| Pelvic floor | 5–15.1 |
| Neurology | 2–6.1 |
| Geriatrics | 2–6.1 |
| Rheumatology | 2–6.1 |
| Sporty | 1–3 |
| Pediatrics | 1–3 |
| Mental health | 1–3 |

### 3.3 | Stage 3. Psychometric properties assessment

Of the total sample ($n$ = 343) used in stage 3 (Table 2), 66.2% were female and 33.8% were male, with a mean age of 39.45 years (SD = 10.1), 26.2% held a master's degree and 6.1% held a PhD. The mean years of work experience was 18 years and the mean time in

**TABLE 2** Socio-demographic characteristics of the sample ($n$ = 343).

| Clinical and socio-demographic characteristics of the sample | *n* | Percentage (%) | Mean | SD |
|---|---|---|---|---|
| Gender ($n$ = 343) | | | | |
| Male | 116 | 33.8 | | |
| Female | 227 | 66.2 | | |
| Age ($n$ = 343) | | | 39.45 | 10.1 |
| 18–26 | 39 | 11.4 | | |
| 27–59 | 297 | 86.6 | | |
| >60 | 7 | 2.0 | | |
| Academic education ($n$ = 343) | | | | |
| Degree | 232 | 67.6 | | |
| Masters | 90 | 26.2 | | |
| PhD | 21 | 6.1 | | |
| Professional experience (years) ($n$ = 343) | | | 18.0 | 17.0 |
| 1 year | 5 | 1.5 | | |
| 1–5 years | 67 | 19.5 | | |
| 6–10 years | 46 | 13.4 | | |
| >10 years | 225 | 65.6 | | |
| Current time in work position (years) ($n$ = 323) | | | 8.1 | 7.9 |
| 1 year | 43 | 12.5 | | |
| 1–5 years | 112 | 32.7 | | |
| 6–10 years | 52 | 15.2 | | |
| >10 years | 116 | 33.8 | | |
| Work environment ($n$ = 343) | | | | |
| Public | 134 | 39.1 | | |
| Private | 184 | 53.6 | | |
| Privately managed with state funding | 25 | 7.3 | | |
| Type of employment ($n$ = 343) | | | | |
| Self-employed | 83 | 24.2 | | |
| Employed | 260 | 75.8 | | |
| Type of patients ($n$ = 330) | | | | |
| Neurological patient | 37 | 10.8 | | |
| Geriatric patient | 23 | 6.7 | | |
| Mental health and disability patient | 6 | 1.7 | | |
| Sports patient | 8 | 2.3 | | |
| Traumatology patient | 125 | 36.4 | | |
| Pediatric patient | 23 | 6.7 | | |
| Gynecology/urology patient | 7 | 2.0 | | |
| Others | 101 | 29.4 | | |

their current job was 8.1 years. Over half of the participants (53.6%) worked in the private sector and almost three-quarters of the sample (75.8%) were salaried employees. Almost 50% of the respondents stated that most of the patients they see are related to trauma (36.4%) and neurological (10.8) needs; whereas 29.4% treated patients with a wide variety of symptoms.

A table with the sociodemographic characteristics of the sample used in the study is shown below.

### 3.3.1 | Construct validity

#### *3.3.1.1 | Factorial structure*

The results of the exploratory factor analysis showed that the dataset was adequate for EFA ([KMO] coefficient = 0.875, Barlett's Test of Sphericity ($\chi^2$) = $\chi^2$ = 2387.431, $p < 0.000$). Subsequently, the factor loadings of each of the items, overlap and the screen plot were checked, and their factor loadings were greater than 0.40. Thus, the structure of the scale consisted of four dimensions and 15 items (RB [*N* items = 4]; IP [*N* items = 4]; PE [*N* items = 3] and TC [*N* items = 4]), with a total explained variance of 67.6 (Kline, 2015; Lorenzo-Seva, 1999). The final version of the PCTR-PT is included as Supporting Information S1: Appendix C (Spanish version) and Supporting Information S1: Appendix D (English version).

The results of the factor analysis enabled the construction of a model with four factors whose standardized solution is shown in Figure 2 and whose overall fit indices are shown in Table 3. The result of the chi-square test was significant ($\chi^2(81) = 136.958$; $p < 0.000$), these values allow us to reject the hypothesis of a perfectly adjusted model. Given the problems associated with the use of this test, other statistical tests were analyzed to evaluate the proposed theoretical model, indices that otherwise reflected an acceptable model fit.

### 3.3.2 | Convergent validity

Analyzed using the AVE (Table 4), values >0.50 were obtained for the total scale (0.058) and for the dimensions PE (0.619) and TC (0.689), while for the dimensions RB (0.362) and IP (0.388), these scores were below 0.50.

### 3.3.3 | Internal consistency

Table 4 shows the values of internal consistency analyzed by Cronbach's alpha coefficient and by composite reliability. Regarding Cronbach's alpha, the values ranged between 0.70 and 0.89. As for the composite reliability, these values ranged between 0.67 and 0.93.

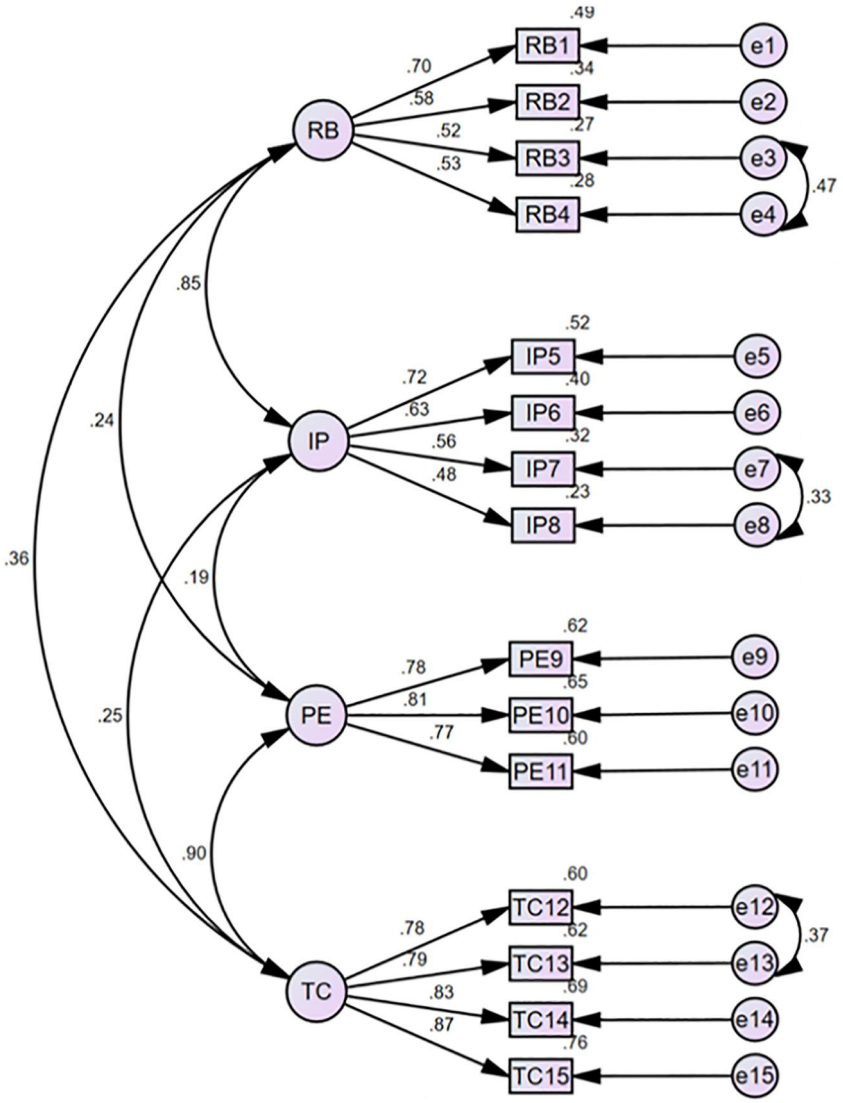


**FIGURE 2** Factor loadings derived from the LS estimation (least squares) CFA (λij). CFA, confirmatory factor analysis; IP, individualized partnership; PE, professional empowerment; RB, relational bond; TC, therapeutic communication.

### 3.3.4 | Temporal stability or test-retest

The ICC analysis revealed very good scores for both the total values (ICC = 0.908, $F = 13.56$, $p < 0.000$) and the 95% confidence intervals, which ranged from 0.873 to 0.936 for the RCTP measurement. Regarding the scores for each of the dimensions, the values obtained ranged from 0.784 (RB) to 0.839 (TC) (Table 4).

## 4 | DISCUSSION

The aim of this study was to adapt the patient version of the PCTR scale to a version for physiotherapists and to study its psychometric properties. Both the adaptation process and the results obtained confirm the PCTR-PHYS scale as being a valid and reliable instrument for assessing the quality of the person-centered therapeutic relationship from the physiotherapist's perspective.

The characteristics of the participating physiotherapists were similar in each stage. In the case of the cognitive interviews, physiotherapists were selected intentionally in order to detect whether the interpretation of the items was different from what was intended by the team that generated the items (Peterson et al., 2017). The psychometric properties were analyzed in a sample of 343 physiotherapists from different centers, with the sociodemographic and occupational characteristics of the participating physiotherapists being similar to those of other studies (Rodríguez-Nogueira, Leirós-Rodríguez, Pinto-Carral, Álvarez-Álvarez, Fernández-Martínez, et al., 2022; Rodríguez-Nogueira, Leirós-Rodríguez, Pinto-Carral, Álvarez-Álvarez, Morera-Balaguer, et al., 2022).

In relation to the content validity of the instrument, it should be noted that both in the first stage, where the items were generated, and in the second stage, where the cognitive pre-test was carried out, standard quality criteria determined by the International Test Commission were followed (Hernández et al., 2020). Thus, thanks to the two rounds of cognitive interviews conducted with physiotherapists, it was possible to identify difficulties in certain items, thereby resolving the problems of understanding and the ability to respond to these items (Peterson et al., 2017).

Regarding construct validity, the results of the CFA show that the instrument maintains the same four-factor structure of the patient version with acceptable model fit indices (Rodríguez-Nogueira, Morera Balaguer, et al., 2020).

Concerning the convergent validity, analyzed by means of the AVE, values >0.50 were obtained for the total scale and for two of the four dimensions. In the RB and IP dimensions, the values were lower than 0.05, which means that these dimensions present some difficulty in sharing more than 50% of their variance with their elements (Hair et al., 2018; Ramos et al., 2018), however, further studies are needed to determine the trend of these values.

As for the reliability of the instrument, the results obtained for composite reliability and internal consistency by means of Cronbach's alpha were very similar with acceptable values for both the instrument as a whole and for each of its factors. Finally, it should be noted that excellent results were also obtained for test-retest reliability.

It should be noted that the PCTR scale, with its versions for patients (PCTR-PT) and physiotherapists (PCTR-PHYS), is the first instrument that will enable the evaluation and comparison of the experiences and perceptions of the two actors involved in the therapeutic relationship in physiotherapy contexts. The concordance in these experiences and perceptions is related to treatment outcomes (Bachelor, 2013; Tryon et al., 2007) which indicates the importance of being able to measure them, and to know in which parameters they differ in order to improve the therapeutic relationship in physiotherapy services.

**TABLE 3** Indices of goodness of fit of the confirmatory model.

| Index | Value |
|---|---|
| CFI | 0.976 |
| TLI | 0.969 |
| GFI | 0.950 |
| SRMR | 0.040 |
| RMSEA | 0.045 |
| RMR | 0.027 |
| Goodness of fit test | $\chi^2 = 136.958$; gl = 81; $p < 0.0001$ |
| Reason for fit | $\chi^2/gl = 1.69$ (<3) |

Abbreviations: CFI, comparative fit index; GFI, goodness of fit index; RMR, Root Mean Residual; RMSEA, Root Mean Standard Error of Approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.

**TABLE 4** Internal consistency: Cronbach's alpha for each dimension and after item-reduction ($n = 343$), test-retest reliability comparing T1 with T2: ICC on scale level ($n =$ ) of the RCTP.

| Factors | ICC (95% CI) | Composite reliability | Cronbach's alpha | AVE |
|---|---|---|---|---|
| F1. RB | 0.784 (0.699–0.851) | 0.673 | 0.704 | 0.343 |
| F2. IP | 0.746 (0.623–0.832) | 0.692 | 0.710 | 0.365 |
| F3. PE | 0.820 (0.749–0.877) | 0.830 | 0.830 | 0.621 |
| F4. TC | 0.839 (0.772–0.891) | 0.899 | 0.898 | 0.671 |
| Total | 0.908 (0.873–0.936) | 0.938 | 0.863 | 0.508 |

Abbreviations: ICC, intra-class correlation coefficient; IP, individualized partnership; PE, professional empowerment; RB, relational bond; TC, therapeutic communication.

This study is not exempt from some limitations. Firstly, it should be noted that the instrument was adapted in the Spanish context and therefore cannot be generalized to other contexts. Secondly, it should be considered that convenience sampling was carried out and this may lead to a selection bias. However, the characteristics of the sample correspond to those of the Spanish population of physiotherapists.

Future studies may compare measures of the quality of the therapeutic relationship from the perspective of both patients and physiotherapists at the same moment in the relationship. These results could provide insight into the gap between the two and identify areas for improvement in clinical practice. In addition, future studies could adapt versions of the scale to other contexts and cultures and perform a multi-group comparison to assess the scale's measurement invariance.

In conclusion, the process of adapting the PCTR-PT instrument to a version for physiotherapists (PCTR-PHYS) and the psychometric properties of the new instrument in a sample of Spanish physiotherapists are presented. It is a valid and reliable tool, which is easily administered and allows the quality of the person-centered therapeutic relationship to be assessed from the perspective of physiotherapists.

## 5 | IMPLICATIONS ON PHYSIOTHERAPY PRACTICE

The results confirm the validity and reliability of the PCTR-PHYS scale for assessing the quality of the person-centered therapeutic relationship from the perspective of physiotherapists. Therefore, the PCTR in its version for patients and physiotherapists will allow to assess and compare the experiences and perceptions of those involved in the therapeutic relationship. We believe that these findings could be of a particular importance for achieve excellence in health services and provide person-centered care, there is a clear need to incorporate specific resources into clinical practice to evaluate the quality of the therapeutic relationship from the perspective of both the persons being treated and the professionals providing care.

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### CONFLICT OF INTEREST STATEMENT

Any potential conflicts of interest are disclosed. All individuals named as authors qualify for authorship. All persons listed as authors have participated sufficiently in the work to take public responsibility for the content of the manuscript.

### DATA AVAILABILITY STATEMENT

The data extracted from each phase of the study is held by the authors and is available on request.

### ETHICS STATEMENT

The ethical approval of this study was obtained from the research ethics committee of the University of León (SPAIN), reference number: ULE-034-2021. As this was not an experimental study, it was not registered as a clinical trial.

### PATIENT CONSENT STATEMENT

All participants granted informed consent in stage 2 and 3 of the study.

### PERMISSION TO REPRODUCE MATERIAL FROM OTHER SOURCES

The authors have permission to reproduce the material included in the study.

### ORCID

*Óscar Rodríguez-Nogueira* https://orcid.org/0000-0002-4203-5784
*Abel Nogueira López* https://orcid.org/0000-0001-6761-2907

### REFERENCES

Bachelor, A. (2013). Clients' and therapists' views of the therapeutic alliance: Similarities, differences and relationship to therapy outcome. *Clinical Psychology & Psychotherapy*, *20*(2), 118–135. https://doi.org/10.1002/CPP.792

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74–94. https://doi.org/10.1007/BF02723327

Batista-Foguet, J. M., Coenders, G., & Alonso, J. (2004). Análisis factorial confirmatorio. Su utilidad en la validación de cuestionarios relacionados con la salud. *Medicina Clínica*, *122*(1), 21–27. https://doi.org/10.1157/13057542

Finger, M. E., Cieza, A., Stoll, J., Stucki, G., & Huber, E. O. (2006). Identification of intervention categories for physical therapy, based on the international classification of functioning, disability and health: A Delphi exercise. *Physical Therapy*, *86*(9), 1203–1220. https://doi.org/10.2522/ptj.20050134

Fleiss, J. L. (2011). *The design and analysis of clinical experiments* (I. John Wiley & Sons, Ed.). Wiley.

Gelso, C. J., & Carter, J. A. (2016). The relationship in counseling and psychotherapy: Components, consequences, and theoretical antecedents. *The Counseling Psychologist*, *13*(2), 155–243. https://doi.org/10.1177/0011000085132001

Hair, J. F., Babin, B., Anderson, R., & Black, W. (2018). Multivariate data analysis (Cengage Learning, Ed.; 8th ed.).

Hamilton, C. B., Hoens, A. M., McQuitty, S., McKinnon, A. M., English, K., Backman, C. L., Azimi, T., Khodarahmi, N., & Li, L. C. (2018). Development and pre-testing of the Patient Engagement in Research

Scale (PEIRS) to assess the quality of engagement from a patient perspective. *PLoS One*, *13*(11), 1–18. https://doi.org/10.1371/journal.pone.0206588

Hauck-Filho, N., & Valentini, F. (2020). Coeficientes de fidedignidade e violações dos pressupostos essencialmente tau-equivalentes. *Avaliação Psicológica*, *19*(3), a–b. https://doi.org/10.15689/AP.2020.1903

Hernández, A., Hidalgo, M. D., Hambleton, R. K., & Gómez-Benito, J. (2020). International test commission guidelines for test adaptation: A criterion checklist. *Psicothema*, *32*(3), 390–398. https://doi.org/10.7334/psicothema2019.306

Holmes, M. B., Scott, A., Camarinos, J., Marinko, L., & George, S. Z. (2022). Working Alliance Inventory (WAI) and its relationship to patient-reported outcomes in painful musculoskeletal conditions. *Disability & Rehabilitation*, *45*(8), 1–7. https://doi.org/10.1080/09638288.2022.2060337

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Institute of Medicine. (2001). Shaping the future; crossing the quality chasm: A new health system for the 21th century. *IOM* (Issue March). https://doi.org/10.17226/10027

Kinney, M., Seider, J., Beaty, A. F., Coughlin, K., Dyal, M., & Clewley, D. (2020). The impact of therapeutic alliance in physical therapy for chronic musculoskeletal pain: A systematic review of the literature. *Physiotherapy Theory and Practice 36*(8), 886–898. Taylor and Francis Ltd. https://doi.org/10.1080/09593985.2018.1516015

Kline, R. B. (2015). Principles and practice of structural equation modeling (Guilford publications., Ed.; Third).

Lorenzo-Seva, U. (1999). Promin: A method for oblique factor rotation. *Multivariate Behavioral Research*, *34*(3), 347–365. https://doi.org/10.1207/S15327906MBR3403_3

Marôco, J. (2014). Análise de equações estruturais: Fundamentos teóricos, software e aplicação (L. Report Number, Ed.).

McCabe, E., Roduta Roberts, M., Miciak, M., Sun, H., & Gross, D. P. (2021). An investigation of the measurement properties of the physiotherapy therapeutic relationship measure in patients with musculoskeletal conditions. *European Journal of Physiotherapy*, *25*(2), 114–126. https://doi.org/10.1080/21679169.2021.2005138

Mead, N., & Bower, P. (2000). Patient-centredness: A conceptual framework and review of the empirical literature. *Social Science & Medicine*, *51*(7), 1087–1110. https://doi.org/10.1016/S0277-9536(00)00098-8

Miciak, M., Mayan, M., Brown, C., Joyce, A. S., & Gross, D. P. (2018). The necessary conditions of engagement for the therapeutic relationship in physiotherapy: An interpretive description study. *Archives of Physiotherapy*, *8*(1), 3. https://doi.org/10.1186/s40945-018-0044-1

Morera-Balaguer, J., Botella-Rico, J., Martínez González, M., Medina-Mirapeix, F., & Rodríguez Nogueira, Ó. (2018). Physical therapists' perceptions and experiences about barriers and facilitators of therapeutic patient-centred relationships during outpatient rehabilitation: A qualitative study. *Brazilian Journal of Physical Therapy*, *22*(4), 328–335. https://doi.org/10.1016/j.bjpt.2018.06.005

Morera-Balaguer, J., Botella-Rico, J. M., Catalán-Matamoros, D., Martínez-Segura, O.-R., Leal-Clavel, M., & Rodríguez-Nogueira, Ó. (2021). Patients' experience regarding therapeutic person-centered relationships in physiotherapy services: A qualitative study. *Physiotherapy Theory and Practice*, *37*(1), 17–27. https://doi.org/10.1080/09593985.2019.1603258

Morgan, S., & Yoder, L. H. (2012). A concept analysis of person-centered care. *Journal of Holistic Nursing*, *30*(1), 6–15. https://doi.org/10.1177/0898010111412189

Peterson, C. H., Peterson, N. A., & Powell, K. G. (2017). Cognitive interviewing for item development: Validity evidence based on content and response processes. *Measurement and Evaluation in Counseling and Development*, *50*(4), 217–223. https://doi.org/10.1080/07481756.2017.1339564

Ramos, A., Ramos, A., Rosado, A., Serpa, S., Cangas, A., Gallego, J., & Ramos, L. (2018). Validity evidence of the Portuguese version of the five facet mindfulness questionnaire. *Revista de Psicologia del Deporte*, *27*(2), 87–98. https://www.rpd-online.com/article/view/1747

Rodríguez-Nogueira, O., Botella-Rico, J., Martínez González, M. C., Leal Clavel, M., Morera-Balaguer, J., & Moreno-Poyato, A. R. (2020). Construction and content validation of a measurement tool to evaluate person-centered therapeutic relationships in physiotherapy services. *PLoS One*, *15*(3), e0228916. https://doi.org/10.1371/journal.pone.0228916

Rodríguez-Nogueira, Ó., Morera Balaguer, J., Nogueira López, A., Roldán Merino, J., Botella-Rico, J.-M., del Río-Medina, S., & Moreno Poyato, A. R. (2020). The psychometric properties of the person-centered therapeutic relationship in physiotherapy scale. *PLoS One*, *15*(11), e0241010. https://doi.org/10.1371/journal.pone.0241010

Rodríguez-Nogueira, Ó., Leirós-Rodríguez, R., Pinto-Carral, A., Álvarez-Álvarez, M. J., Fernández-Martínez, E., & Moreno-Poyato, A. R. (2022). The relationship between burnout and empathy in physiotherapists: A cross-sectional study. *Annals of Medicine*, *54*(1), 933–940. https://doi.org/10.1080/07853890.2022.2059102

Rodríguez-Nogueira, Ó., Leirós-Rodríguez, R., Pinto-Carral, A., Álvarez-Álvarez, M. J., Morera-Balaguer, J., & Moreno-Poyato, A. R. (2022). The association between empathy and the physiotherapy–patient therapeutic alliance: A cross-sectional study. *Musculoskeletal Science and Practice*, *59*, 102557. https://doi.org/10.1016/J.MSKSP.2022.102557

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), 23–74.

Scholl, I., Zill, J. M., Härter, M., & Dirmaier, J. (2014). An integrative model of patient-centeredness—A systematic review and concept analysis. *PLoS One*, *9*(9), e107828. https://doi.org/10.1371/journal.pone.0107828

Schwarz, N. (2007). Cognitive aspects of survey methodology. *Applied Cognitive Psychology*, *21*(2), 277–287. https://doi.org/10.17226/930

Sidani, S., & Fox, M. (2014). Patient-centered care: Clarification of its specific elements to facilitate interprofessional care. *Journal of Interprofessional Care*, *28*(2), 134–141. https://doi.org/10.3109/13561820.2013.862519

Street, R. L., & Mazor, K. M. (2017). Clinician-patient communication measures: Drilling down into assumptions, approaches, and analyses. *Patient Education and Counseling*, *100*(8), 1612–1618. https://doi.org/10.1016/J.PEC.2017.03.021

Terwee, C. B., Bot, S. D. M., de Boer, M. R., van der Windt, D. A. W. M., Knol, D. L., Dekker, J., Bouter, L. M., & de Vet, H. C. W. (2007). Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of Clinical Epidemiology*, *60*(1), 34–42. https://doi.org/10.1016/j.jclinepi.2006.03.012

Tryon, G. S., Blackwell, S. C., & Hammel, E. F. (2007). A meta-analytic examination of client-therapist perspectives of the working alliance. *Psychotherapy Research*, *17*(6), 629–642. https://doi.org/10.1080/10503300701320611

Wagner, E. H., Bennett, S. M., Austin, B. T., Greene, S. M., Schaefer, J. K., & Vonkorff, M. (2005). Finding common ground: Patient-centeredness and evidence-based chronic illness care. *Journal of Alternative & Complementary Medicine*, *11*(Supplement 1), s-7–s-15. https://doi.org/10.1089/acm.2005.11.s-7

WHO. (2018). *Integrated primary health care-based service delivery in the global conference on primary health care, Astana, Kazakhstan*. World Health Organization. http://www.who.int/servicedeliverysafety/areas/people-centred-care/news/ipchs-astana/en/

Willis, G. B. (2005). Cognitive interviewing in practice: Think-Aloud, verbal probing, and other Techniques. In C. S. P. Thousand Oaks (Ed.), *Cognitive interviewing* (pp. 42–65). SAGE Publications, Inc. https://doi.org/10.4135/9781412983655.n4

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