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Confidence in providing primary care to patients with low back pain among physiotherapists

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Abstract

Background Low back pain (LBP) is a common musculoskeletal disorder with distinct clinical features. Direct access to physiotherapy (PT), with physiotherapists (PTs) acting as primary care providers, can improve the management of individuals with LBP. However, clinician confidence may affect their willingness to provide primary care as well as their performance as primary care providers. The objectives of this study were: (1) to develop the Primary Care Confidence Scale (PCCS), and (2) to evaluate PTs' confidence in managing LBP in primary care.

Methods The PCCS questionnaire was developed through a seven-stage Delphi process involving experts who modified an existing self-confidence scale. The questionnaire was completed by 314 PTs, 140 of whom completed it again after 2 weeks. Structural validity was evaluated using exploratory and confirmatory factor analysis. Reliability was assessed with Cronbach's alpha for internal consistency and intraclass correlation coefficients (ICC) for test–retest reliability. Spearman tests assessed correlations between background characteristics and PCCS scores. Two independent t-tests estimated the effects of gender and post-graduate education. One-way ANOVA was used to evaluate the impact of the workplace.

Results The PCCS had a multidimensional structure with three factors demonstrating an acceptable model fit and good reliability ($\alpha = 0.83$, ICC = 0.78). The mean confidence level was 75% (PCCS = 45 ± 6/60), with moderate positive correlations observed between PCCS scores and both age ($r = 0.42$, $p < 0.001$) and years of experience ($r = 0.33$, $p < 0.001$). PTs working in public or private outpatient clinics had significantly higher scores (PCCS = 45.3 and 47.0, respectively) compared to PTs working in an inpatient hospital or in rehabilitation centers (PCCS = 40.6 and 40.3, respectively, $p < 0.009$).

Conclusions The newly developed PCCS demonstrated adequate validity and high reliability, suggesting that it is suitable for measuring confidence in treating patients with LBP in primary care settings. PTs demonstrated confidence levels indicative of their perception to manage patients in primary care. Health policy makers and educators could incorporate the PCCS into training and evaluation programs to assess clinicians' confidence and perceived readiness to treat LBP in primary care.

Keywords Low back pain, Confidence, Primary care, Physiotherapy, Direct access

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Introduction

Low back pain (LBP) is common among people of all ages and is a significant cause of activity limitation and work absence worldwide [1]. In most cases, LBP is both a symptom and "diagnosis of exclusion", meaning no identifiable patho-anatomical cause was found [2–4]. In primary care practice, triage of patients with LBP aims to exclude cases where pain is a secondary symptom of severe lumbar spine pathology (e.g., malignancies, vertebral fractures), or extrinsic lumbar spine pathology presenting as LBP (e.g., pyelonephritis, abdominal aortic aneurysm) [5].

Although the incidence of severe spinal pathologies is not high (estimated at 1%), the consequences of misdiagnosis are serious [6]. Therefore, many clinical guidelines recommend screening for "red flags" [7], defined as findings that may indicate that the patient's clinical presentation is due to severe pathologies [8]. This is particularly important in primary care, as the clinician is the first to assess the patient's condition.

In recent years, direct access to musculoskeletal physiotherapy (PT) services, with physiotherapists (PTs) acting as primary care providers, has been promoted worldwide [9] as it has been shown to improve patient care by reducing costs, clinic visits, pharmacologic interventions, and imaging while improving discharge outcomes and patient satisfaction [10, 11]. As a result, PT societies and organizations have promoted the use of screening for red flags and medical conditions to ensure safe and effective patient care, as recommended in clinical practice guidelines [7, 12]. Notwithstanding the recommendation to integrate screening for red flags into primary care, only a few items categorized as red flags have high diagnostic accuracy [13]. Henschke et al. [6] studied a cohort of 1,172 patients with acute LBP in primary care and found that 80.4% had at least one red flag. However, at 12-month follow-up, severe pathology was present in only 11 (0.9%) cases. In addition, a systematic review by Galliker et al. [14] concluded that severe spinal disorders are frequently encountered in emergency departments; however, their overall prevalence in the general population remains low.

Despite the low prevalence of severe lumbar spine conditions and the low diagnostic accuracy of the red flag items, many clinicians are still very concerned about the consequences of misdiagnosing a severe lumbar spine condition [6]. This may lead to low clinician confidence in treating patients with LBP, which is likely to be associated with less effective care and poor clinical outcomes [15]. Moreover, since LBP is both a symptom and a diagnosis of exclusion, clinicians must tolerate clinical uncertainties and confidently rule out other differential diagnoses. [16, 17].

Clinical confidence is a firm belief, trust, and reliance on oneself and on one's strengths and clinical abilities to examine, treat, and care for a particular group of patients [18]. It is an essential personal attribute and a fundamental element in healthcare education and practice [18]. Clinical confidence affects clinicians' willingness to initiate procedures, ask for assistance, and self-assess their abilities [19].

The Practitioner self-confidence scale (PCS), developed in 1993, measures clinician self-confidence in diagnosing and treating patients with LBP; self-confidence in preventing patient chronicity, meeting patient expectations and increasing satisfaction; and the practitioner's personal feelings about working with patients with LBP. It includes 10 items, rated on a 5-point Likert scale [20]. However, the questionnaire lacks essential components relevant to primary care, such as assessing confidence in identifying red flags and serious pathology, interpreting imaging results, and conducting medical screening, which is particularly important given the role of PTs as primary care providers. Other existing questionnaires focus on self-efficacy in examination and treatment but similarly fail to address these critical elements, further highlighting the need for a comprehensive tool like the PCCS [21–23]. In addition, this self-confidence questionnaire has not been validated for PTs, particularly those working and practicing in direct patient access; reflecting the current state. Finally, the original English version of the PCS has not been translated, cross-culturally adapted, or validated in other languages.

Therefore, the aims of this study were: (1) to develop the Primary Care Confidence Scale (PCCS), which measures the confidence of primary care clinicians, and (2) to assess the confidence level of PTs managing LBP in primary care using the PCCS.

Methods

Study design

The study design adhered to the COSMIN checklist for patient-reported outcome measure instruments [24]. The methods and results are presented in line with the Guidelines for Reporting Reliability and Agreement Studies (GRRAS) [25]. Ethical approval for the study was granted by the Ariel University Ethics Committee (Ethics Protocol Reference No. AU-HEA-SS-20220212).

Since this study was conducted in Israel, we first translated the original PCS into Hebrew, adapted it transculturally, and then developed new items and revised the original items.

The translation procedure

We have used the original English version of the PCS for the translation and adaptation. The original authors were

contacted and their consent to translate and modify the PCS was obtained. The translation process followed a five-stage approach according to the guidelines for cross-cultural adaptation of self-report measures [26], as previously described [21]. The process involved forward and backward translation and review by a committee of experts to ensure conceptual equivalence, focusing on equivalence of items, semantics, operations and measurements. There were no discrepancies in the forward and backward translations. However, minor differences in wording were identified and resolved in a joint discussion between the translators and the expert panel to ensure the accuracy and cultural relevance of the final version. In addition, 39 PTs (ages 33.1 ±5.4 years, work experience 7.2 ±6.9 years, 49% women) answered the translated version in a pilot test. They were asked about ambiguous or unclear words; the time it took them to complete the questionnaire and their understanding of each question. Participants reported no problems with the clarity or relevance of the questions and indicated that the questionnaire was easy to understand and could be completed within a reasonable timeframe. Their feedback confirmed the appropriateness of the translation and adaptation process.

The development of the primary care confidence scale

The PCCS was developed through a 7-stage Delphi process [27]. New questions were added to the original questionnaire to address clinicians' concerns about misdiagnosing serious pathologies, due to their professional responsibilities in primary care.

During stage 1, the researchers, serving as facilitators, defined the construct to be developed, formulated new items, and established criteria for the Delphi technique. In phase 2, a panel of experts was formed, consisting of 10 PTs, 4 physicians, and 2 medical psychologists. The expert panel was selected based on their extensive clinical experience in the management of LBP, their academic qualifications and their expertise in the development of assessment tools. Each member of the panel had more than a decade of experience in treating patients with LBP, had an academic degree at master's or doctoral level, and some of them also had research experience in translating and developing questionnaires. This helped to ensure the methodological rigor and clinical applicability of the scale. The panel received a comprehensive description of the construct, questions, context, and evaluation criteria.

In phase 3, panelists responded anonymously, suggesting additional items to augment the original PCS. Phase 4 involved moderators grouping new items and eliminating redundancies. In phase 5, panelists provided feedback, proposed changes, and assigned ratings to each item within the newly organized clusters. The moderators for phase 4 were the research team, comprising one psychology professor and four PTs, including a professor and doctoral students. Phase 6 involved panelists receiving statistical feedback reflecting group responses. Iterative rounds continued until each item achieved consensus of at least 80%. Any concerns or disagreements were resolved during the final discussion between the expert group and researchers, according to the Delphi process [27].

In the seventh and final phase, 34 PTs working in direct access (age 36.4 ±6.3 years, work experience 9.7 ±9.1 years, 53% female) were interviewed after completing the revised questionnaire, to assess content validity. Participants provided insights on item relevance, context, potential omissions, clarity issues, and time required to complete the questionnaire. Care was taken to ensure that they understood each question. Several respondents suggested minor changes to the wording of the questions. However, no major issues were reported.

The PCSS psychometric assessment and the evaluation of the PT's confidence

The assessment of the psychometric properties of the PCCS and the evaluation of PTs' confidence levels in treating LBP in primary care were conducted online via the Qualtrics platform [28]. Participants were recruited through professional social media groups targeting PTs, after obtaining approval from group administrators to distribute the survey link. This method provided access to a relevant audience and is widely accepted for recruitment studies [29, 30]. Following COSMIN guidelines for measurement error and reliability, a minimum sample size of 100 participants was targeted to ensure robust assessment of reliability [24]. Participants completed the newly developed PCCS questionnaire at two different time points, approximately 14 days apart. This two-week interval was strategically chosen to minimize recall bias without allowing significant changes in the measured attributes to occur between evaluations [31].

Given that Hebrew is a gendered language employing binary pronouns and assigning gender to various parts of speech, the use of masculine generic forms has been shown to introduce bias and potentially lead to inaccurate conclusions [32]. To address this, the online questionnaire utilized gender-specific language corresponding to the participant's gender selection in the demographic section.

The initial survey page outlined the study's purpose and provided the principal investigator's contact information. To ensure anonymity, participants created a personal code using the last four digits of their national identity number. Consent was implied by clicking"Continue,"with participants informed of their right to withdraw at any

time. IP address tracking prevented multiple submissions from the same individual. Inclusion criteria required participants to have at least an entry-level degree in PT and a valid license to practice PT issued by the Ministry of Health of Israel. An initial screening question confirmed that participants had a license to practice PT in Israel, and negative responses resulted in termination of the survey to ensure that only eligible participants completed the survey.

Statistical analysis

Exploratory factor analysis (EFA) with principal component analysis and varimax rotation was employed to assess the PCCS's structural validity. The Kaiser–Meyer–Olkin (KMO) measure evaluated item correlations and coherency, while Bartlett's test of sphericity confirmed significance ($p < 0.05$) [33]. The minimum acceptable KMO index for sampling adequacy was set at 0.636, with values of 0.7–0.79 considered good and 0.8–0.9 excellent [33–35]. Factor determination relied on eigenvalues ≥ 1 and scree plot analysis. Items were extracted based on factor loading patterns (≥ 0.30), with items showing communality < 0.4 deemed invalid [34]. For questionnaire structure validation, the extracted factors needed to account for at least 50% of the total variance in results [36]. Confirmatory factor analysis (CFA) was then conducted, treating the questionnaire items as ordinal variables using diagonally weighted least squares estimation [37]. Multiple fit indices included comparative fit index (CFI) > 0.95, Tucker-Lewis index (TLI) > 0.95, root-mean-square error of approximation (RMSEA) < 0.05, and standardized root mean square residual (SRMR) < 0.08 [37].

Test–retest reliability was evaluated using intraclass correlation coefficients (ICC), with interpretations as follows: > 0.90 excellent, 0.75–0.90 good, and 0.50–0.75 moderate [38]. Floor or ceiling effects were considered to be present if more than 15% of the participants reached the lowest or highest possible value. This was determined using the classical method [39] or the'scale width'method [40], which adjusts the range based on the tool's minimal detectable change (MDC) for a more robust assessment. The standard error of measurement (SEM) was calculated using the pooled standard deviation formula: $SEM = SD * \sqrt{1} - ICC$. Minimal detectable change (MDC) was derived as: $MDC = SEM * 1.96 * \sqrt{2}$ [38]. Spearman tests examined correlations between age, experience, and questionnaire scores. Independent t-tests assessed effects of gender and post-graduate education on scores. A one-way ANOVA evaluated workplace impact across five categories. Data analysis employed SPSS Statistics for Windows version 27.0 (IBM Corp., Armonk, NY). Confirmatory Factor Analysis (CFA) utilized the"lavaan"and "lavaanPlot"packages in RStudio (RStudio, Inc, Boston, MA [41, 42].

Results

Internal structure and construct validity

The Delphi procedure added 6 new items to the original PCS questionnaire. Table 1 describes the PCS and the PCCS.

The PCSS questionnaire was distributed and answered by 314 PTs, 140 of whom completed it again after 2 weeks. We conducted the EFA with the smaller sample, (i.e., 140 participants), and the CFA with the larger data set of 314 participants. This approach allowed to validate the factor structure using the larger data set for the CFA [43].

The KMO test confirmed sample adequacy for analysis (KMO $= 0.89$). Bartlett's sphericity test ($\chi^2(120) = 1291.903$, $p < 0.001$) indicated sufficient item correlations. Eigenvalues > 1 resulted in three factors among the 16 items. The identified factors were then reviewed by a panel of experts who confirmed that the distribution was consistent with the following domains: LBP practice confidence, identification of red flags and serious pathology, and imaging and medical screening. Figure 1 displays the scree plot with eigenvalue distribution and the component preceding the inflection point.

These three factors explained 56.8% of the total variance of the participants' responses. In addition, items 5 & 6 demonstrated communalities of less than 0.40. Items 5 and 6 were removed due to their low, unsatisfactory values[36]. In addition, items 7 and 9 were excluded after evaluation by the expert panel. The removal of all items was decided by consensus with the expert panel and the researchers, as these original PCS items were considered to be the least representative of the construct. The repeated EFA showed the presence of 3 factors associated with the 12 items of the instrument. Figure 2 displays the scree plot with eigenvalue distribution and the component preceding the inflection point.

These three factors explained 59.71% of the total variance of the participants' responses. The EFA results showed that all communalities were above 0.40. For 11 of the 12 items, the extracted communalities surpassed a threshold of 0.5, while 7 of the 12 items exceeded a value of 0.6. As all items loaded significantly, no items were removed from the repeated analysis.

Table 2 describes the communalities of the repeated EFA principal axis factorization. For structural validity, the calculated KMO (0.88) and Bartlett's test ($p < 0.001$) met the a priori set values. The three-factor CFA of the PCCS (Fig. 3) yielded the following model fit indices: NFI $= 0.98$, CFI $= 0.99$, RMSEA $= 0.04$ (90% CI 0.03—0.06, $p = 0.57$), and SRMR $= 0.05$, indicating

Table 1 The original PCS and the added PCCS items

No	Item	Added PCCS items	Removed items	Factor
1	I lack the diagnostic tools or knowledge required to perform an effective assessment of patients with low back pain			1
2	I know exactly what I need to do to provide effective treatment to patients with low back pain			1
3	I find it difficult to communicate my concerns regarding the discovery of a suspicious findings or significant pathology to patients with low back pain	Y		2
4	I feel very comfortable treating patients with low back pain			1
5	In many patients with low back pain, no physical problem can be found		Y	
6	I do not have much ability to influence the development of chronic back pain in patients with acute back pain		Y	
7	Patients with low back pain often have unrealistic expectations about the ability of clinicians to improve their condition		Y	
8	I feel confident in recommending not to perform imaging (X-ray, CT, or MRI) despite the expectations of many patients with low back pain			3
9	I often have negative feelings about treating patients with low back pain		Y	
10	Most patients with low back pain are very satisfied with the treatment I provide them			1
11	I am prepared and qualified to treat people with low back pain			1
12	I fear missing a significant pathology in patients with low back pain	Y		2
13	I have the confidence to treat people with low back pain without the need for additional medical specialists, various imaging procedures (X-ray, CT, MRI) or other medical tests	Y		3
14	It is better if I do not treat patients with low back pain until a medical examination has been completed	Y		3
15	I am concerned about the reaction of another medical professional when I refer patients with low back pain to him/her regarding the presence of a 'red flag' in the examination	Y		2
16	I trust in my ability to rule out the presence of significant pathologies in people with low back pain	Y		2

Factor 1 = LBP practice confidence

Factor 2 = Identification of red flags and serious pathology

Factor 3 = Imaging and medical screening

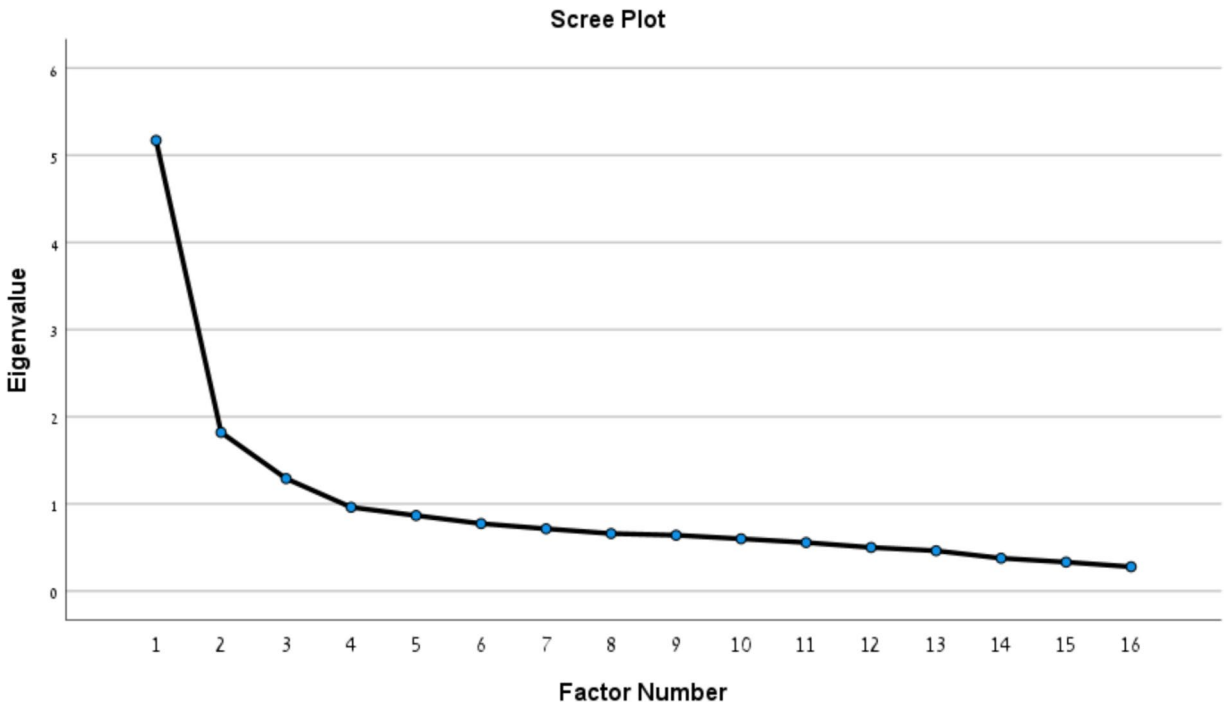

Fig. 1 The sedimentation plot (scree plot) of the first EFA

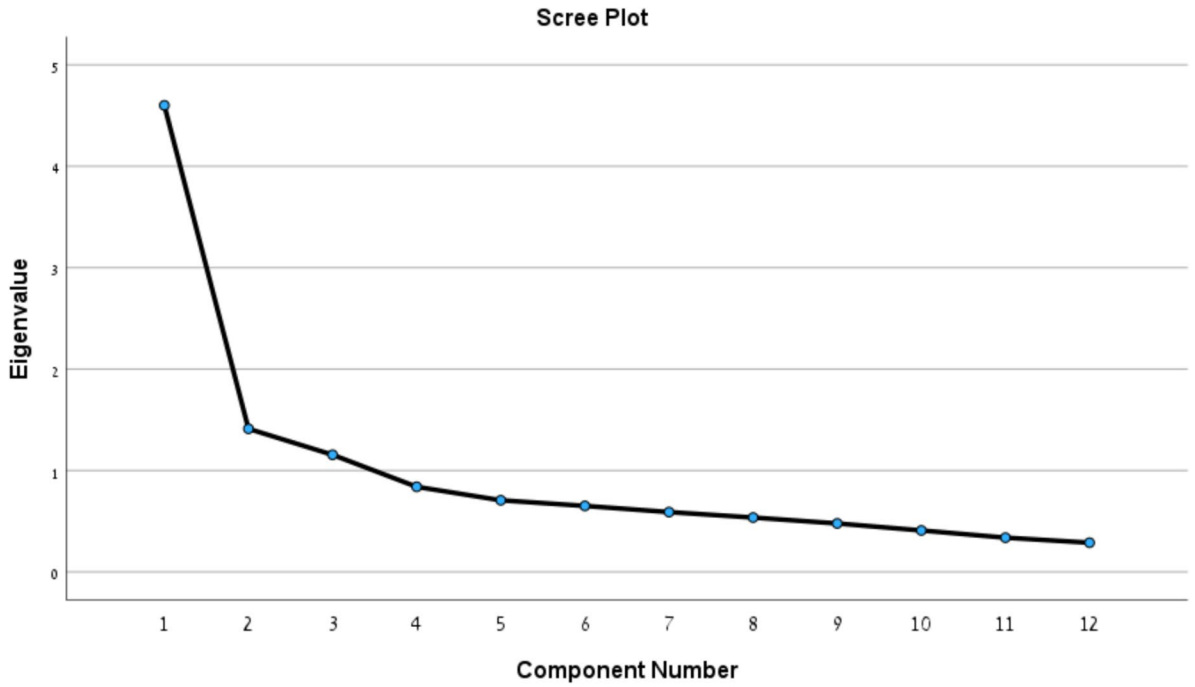

Fig. 2 The sedimentation plot (scree plot) of the second EFA

Table 2 EFA principal axis factoring communalities

PCCS items	Initial	Extraction
1	1.000	0.671
2	1.000	0.682
3	1.000	0.5556
4	1.000	0.735
8	1.000	0.636
10	1.000	0.527
11	1.000	0.744
12	1.000	0.607
13	1.000	0.587
14	1.000	0.437
15	1.000	0.525
16	1.000	0.613

EFA exploratory factor analysis, *PCCS* Primary care confidence scale

a good fit of the model to the data. The correlations between the factors were approximately 0.6 ($p < 0.001$).

Consequently, the validity assessment of the PCCS resulted in a questionnaire with 12 items and possible total scores ranging from 12 to 60 points, with higher scores indicating better clinical confidence.

The finalized PCCS questionnaire is detailed in Supplementary File 1.

Reliability

Table 3 describes the characteristics of the 314 PTs who completed the online questionnaire. Participants ranged from 29 to 72 years, and 55.1% identified as female. Experience ranged from less than 1 year to more than 42 years, and 92 participants (29%) had post-graduate academic training.

The internal consistency, measured by Cronbach's alpha, was calculated using the sample of 314 PTs. It was found to be satisfactory with a value of 0.83. The test–retest reliability of the PCCS was then assessed on a subset of 140 participants, resulting in a good ICC value of 0.78.(95% CI, 0.68–0.84). The calculated SEM value was 1.39 points, and the MDC was 3.85.

PCCS score results

The mean PCCS score was 45 ± 6. No significant floor or ceiling effects were observed using either the classical method or the'scale width'method, as none of the participants scored at the minimum or within the adjusted maximum possible values, indicating that the questionnaire effectively captures variability across the entire score range. There was a moderately positive significant correlation between age, years of experience and PCCS scores (r = 0.33 and 0.42, respectively, $p < 0.001$). No significant gender differences were found. There was no difference in the PCSS score between participants with

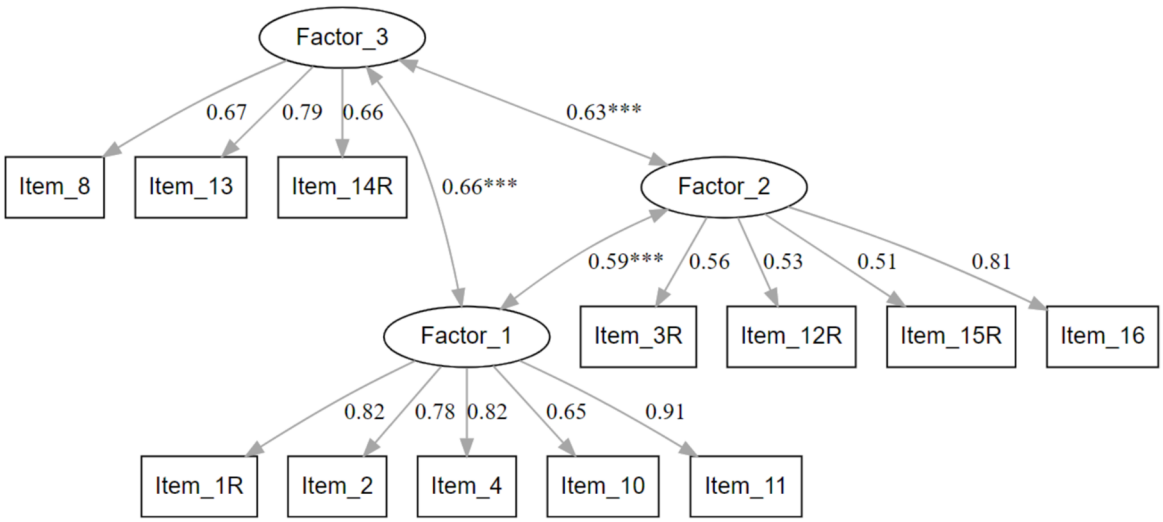

Fig. 3 CFA results of the three-factor PCCS questionnaire. R, representing scale reversing. *** $p < .001$

Table 3 Demographics of the survey respondents (first survey completion, $N = 314$)

Age (years)	**38 ± 9.8**
Gender	
Female	173 (55.1%)
Male	141 (44.9%)
Experience (years)	10 ± 9.9
Postgraduate academic education	92 (29%)
Employment	
Health maintenance organization outpatient clinic	169 (53.6%)
Private practice	77 (24.5%)
Inpatient hospital setting	20 (6.4%)
Inpatient rehabilitation center	19 (6.2%)
Other (not specified)	29 (9.3%)

post-graduate academic education and those with undergraduate degrees (44.7 and 46.0, respectively, $p = 0.58$). The ANOVA testing the effect of workplace showed a significant result ($p < 0.001$). The post-hoc analysis showed that PTs working in public or private outpatient clinics had significantly higher scores (PCCS = 45.3 and 47.0, respectively) compared to PTs working in an inpatient hospital or rehabilitation center (PCCS = 40.6 and 40.3 respectively, $p < 0.009$).

Discussion

This study presents the development of the Hebrew version of the PCCS, a new confidence scale for clinicians treating patients with LBP in primary care. The PCCS demonstrated adequate validity and high reliability. Additionally, our results suggest that PTs show high confidence in treating patients with LBP in primary care, reflecting their perception of treating patients effectively in this setting [44–48].

Although several previous studies have examined PTs'clinical confidence in implementing clinical guidelines and primary care models [15, 49, 50], these studies have not considered some critical components that are essential to primary care, such as red flag and medical screening. Our findings highlight the importance of examining additional aspects related to confidence in providing primary care. Furthermore, the newly developed PCCS could serve not only as a research tool, but also as a practical tool for ongoing monitoring. Such monitoring has the potential to improve the management of LBP in primary care and facilitate its long-term sustainability.

Given that LBP is the leading cause of disability and work absenteeism [1], time and resources should be invested in enhancing understanding of this condition to formulate effective treatments. Research into direct access to PT services is especially important, as this approach has been linked to improved patient outcomes and quality of life [10, 51]. Given the historical context in which PTs have traditionally worked under physician referral, the recent transition to direct access represents a change that requires greater independence and professional confidence [52]. Therefore, the assessment of PTs'confidence is particularly important in this specific context, as it may directly impact their ability to provide safe and effective care.

While only a few studies investigated the confidence of PTs in primary care, numerous studies explored their ability to conduct orthopedic differential diagnoses and recognize red flags [53–55]. Some studies compared PTs

with other healthcare professionals [56, 57]. The findings affirm the knowledge and proficiency of PTs in managing musculoskeletal conditions in primary care. Together with these studies, our findings contribute to understanding how PTs perceive their readiness in treating patients with LBP in primary care.

The correlation between clinical self-confidence and competence remains unclear [58]. Although, after clinical training, confidence is associated with competency [59], overconfidence can be harmful, especially in differential diagnoses, as it may lead to misdiagnosis of serious conditions [60]. It is also important to note that while self-confidence is believed to enhance treatment outcomes [61], no study has quantified the extent of this relationship using validated measures in PT primary care. Future research examining the relationship between self-confidence, competence, and treatment outcomes in primary PT care will help to optimize training and education programs.

Healthcare providers should be consistently evaluated by policy makers to ensure that they have both the knowledge and confidence necessary to perform clinical tasks [58]. The PCCS developed in this study may have practical implications and applications. Policy makers and healthcare providers can utilize the PCCS to evaluate the confidence of clinicians in managing LBP in primary care. Therefore, the PCCS can help determine the efficacy of continuing educational programs focused on triage-based care for individuals with LBP, as enhanced clinician confidence may ultimately improve clinical outcomes [15, 19, 61–63]. This is also important because the readiness to perform triage may minimize unnecessary investigations, interventions and consultations [64].

The Hebrew version of the PCCS demonstrated high reliability and validity. The Cronbach's alpha value obtained indicates excellent internal consistency, affirming its coherence and homogeneity. Caution must be taken when generalizing Cronbach's alpha values, as they are specific to the group of respondents [65]. Nevertheless, the relatively large sample size of the present study adds credibility to the reliability of the Hebrew version of the PCCS [24]. The results of both Exploratory and Confirmatory Factor Analyses further enhance the structural validity. In addition, the newly developed PCSS allows monitoring confidence according to three factors (LBP practice confidence, identification of red flags and serious pathology, and imaging and medical screening), offering potential additional insights into a clinician's confidence.

The findings revealed a moderate correlation between age, experience, and PCCS scores, indicating that PTs tend to gain confidence through repeated interactions with patients experiencing LBP. Additionally, our results highlighted a significant difference between PTs working in public or private outpatient clinics and those working in inpatient hospitals or rehabilitation centers. This is consistent with Bundara's [66] perspective that confidence is developed through repeated context-specific exposures and is not universally applicable, as PTs in public or private outpatient clinics predominantly treat cases of LBP [67, 68].

A notable result was that no difference was found between PTs with post-graduate academic education and those with bachelor's degrees. A possible explanation could be that most master's degree programs in Israel are not primarily focused on musculoskeletal clinical practice. It is plausible that PTs who have a master's degree with a specialization in musculoskeletal clinical practice might have better PCCS scores. This assumption could be supported by studies showing that medical students have more confidence after specialized clinical training and repeated experiences in simulated educational experiences [69].

This study has several limitations. First, only Israeli PTs were studied, which limits generalizability across professions and countries due to differences in the professional culture of primary care providers and direct access pathways to PT services. Therefore, we suggest that future studies expand our work and apply the PCCS to additional healthcare professions in different countries. Second, participant recruitment was conducted via social media, which introduces the possibility of selection bias and may not represent the broader PT population. Social media platforms often attract individuals who are more engaged in professional communities or are more technologically savvy, potentially leading to an overrepresentation of certain demographics [70]. To mitigate this issue, we used a relatively large sample. Finally, although we calculated the MDC of the PCCS, demonstrating an actual change that is outside the measurement error, future studies should evaluate the minimal clinically important difference.

Conclusions

This study discusses the development, validity, consistency, and reliability of the Hebrew version of the PCCS, a self-reported questionnaire, measuring clinicians' confidence in managing LBP in primary care. The confidence PTs display in treating patients with LBP underscores their perception of clinical readiness to effectively treat patients in primary care settings. Health policy makers and educators could incorporate the PCCS into training and evaluation programs to assess clinicians'readiness to treat patients with LBP in primary care.

Abbreviations

CFA Confirmatory factor analysis
CFI Comparative fit index

EFA	Exploratory factor analysis (EFA)
ICC	Intraclass correlation coefficients
KMO	Kaiser-Meyer-Olkin measure
LBP	Low back pain
MDC	Minimal detectable change
PCCS	Primary care confidence scale
PCS	Practitioner self-confidence scale
PT	Physiotherapy
PTs	Physiotherapists
RMSEA	Root-mean-square error of approximation
SEM	Standard error of measurement
SRMR	Standardized root mean square residual
TLI	Tucker-Lewis index

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12875-025-02850-w.

Supplementary Material 1

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Authors' contributions
"RS, TK, AW and SS conceptualized this work and its design; RS was responsible for data acquisition and initial analysis; YN further analyzed the data and modelled it; RS and SS interpreted the study results; RS drafted the work; all authors substantively revised it. All authors approved the submitted version and agreed to be personally accountable for the accuracy or integrity of any part of the work, even ones in which they were not personally involved".

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Data availability
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
All methods were performed in accordance with the ethical standards as laid down in the Declaration of Helsinki and its later amendments or comparable ethical standards. The Ariel University Ethical Committee before its commencement (Ethics Protocol Reference No. AU-HEA-SS-20220212) approved the study. All participants gave informed consent to participate in the research.

Consent for publication
This study includes aggregated data, and based on the Ethical Review Board waiver, consent for publication from participants is not required.

Competing interests
The authors declare no competing interests.

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