Arch Health Sci Res. 2026;13:1-8
DOI: 10.5152/ArcHealthSciRes.2026.26006

Original Article

Translation and Cross-cultural Adaptation of the Client-Centered Rehabilitation Questionnaire into Turkish

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Cite this article as: Uludağ TÖ, Çolak TK, Dereli EE, Özgül B, Çolak İ. Translation and cross-cultural adaptation of the client-centered rehabilitation questionnaire into Turkish. *Arch Health Sci Res.* 2026, 13, 0170, doi: 10.5152/ArcHealthSciRes.2026.26006.

What is already known on this topic?

- *Patient-centered care places the individual at the core of the treatment process, focusing on their unique preferences, values, and needs.*
- *The Client-Centered Rehabilitation Questionnaire (CCRQ) is designed to evaluate patients' perceptions regarding the extent to which rehabilitation services align with the active patient participation, shared decision making, and individualized goal setting.*

What this study adds on this topic?

- *The Turkish version of the CCRQ has demonstrated strong reliability and validity for assessing patient-centered rehabilitation practices in Türkiye, as evidenced by high intraclass correlation coefficients and Cronbach's alpha values, along with consistent results in item-total and squared multiple correlation analyses and 7 factor structure.*
- *Its use in both clinical and research environments could significantly improve rehabilitation services by fostering personalized and comprehensive care methods.*

ABSTRACT

Objective: The Client-Centered Rehabilitation Questionnaire (CCRQ) is designed to evaluate patients' perceptions regarding the extent to which rehabilitation services align with the active patient participation, shared decision making, and individualized goal setting. This study aimed to translate the CCRQ into Turkish and assess its reliability and validity for use in Türkiye.

Methods: The CCRQ was translated and culturally adapted into Turkish using established guidelines. A total of 136 patients completed the questionnaire twice to assess test–retest reliability. Internal consistency was assessed using Cronbach's alpha coefficient. Test–retest reliability was evaluated using intraclass correlation coefficients (ICCs). Exploratory factor analysis was performed to examine the underlying factor structure and construct validity of the scale.

Results: The Turkish version of the CCRQ (TR vs.CCRQ) demonstrated good-to-excellent reliability, with ICC values ranging from 0.81 (95% CI: 0.73-0.86) to 0.90 (95% CI: 0.86-0.93) across subscales and Cronbach's alpha coefficients of 0.86 and 0.88 in the first and second applications, respectively. Spearman's rho correlation coefficients ranged from 0.70 to 0.84 for subscales, indicating robust internal consistency and reliability. Item-total and squared multiple correlation analyses further supported the scale's consistency. It had 7 factors accounting for 63.29% of the variance.

Conclusion: The TR vs CCRQ has proven to be a reliable and applicable tool for evaluating patient-centered rehabilitation practices in Türkiye. This instrument fills an important gap in patient-centered care assessment, enabling improved evaluation and enhancement of rehabilitation services in the Turkish healthcare context.

Keywords: Patient-centered care, rehabilitation, reliability, questionnaire

Introduction

Patient-centered care and rehabilitation are rapidly evolving to address the changing needs of diverse patient populations. This transformation is driven by several factors, including the increase in life expectancy, the growing prevalence of chronic diseases, and the recognition of the need for more personalized healthcare approaches.[1] Patient-centered care places the individual at the core of the treatment process, focusing on their unique preferences, values, and needs.[2] A key feature of this approach is open communication and active collaboration between patients and healthcare professionals, which allows for the co-creation of treatment goals tailored to the patient's specific circumstances.[1-3] Such practices not only empower individuals to take an active role in their own care but also contribute to greater adherence to treatment plans, shorter hospitalization durations, improved quality of life, and reduced anxiety.[4-7]

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Received: January 21, 2026
Revision Requested: March 26, 2026
Last Revision Received: August 5, 2026
Accepted: September 3, 2026
Publication Date: October 26, 2026

By fostering autonomy and self-management, patient-centered care enables individuals to regain control over their lives, which is particularly important for those dealing with long-term or complex health challenges.[2,5,8] These benefits underscore the critical role of patient-centered care and rehabilitation in modern healthcare systems, making it an indispensable approach for achieving holistic and sustainable health outcomes.[5]

Patient-centeredness, also referred to as person-centeredness in medicine, has been defined in various ways. McWhinney described it as "the physician tries to enter the patient's world and sees the illness through the patient's eyes."[9] In hospital settings, patient-centered healthcare includes respect for the patients' values and preferences, coordinated and integrated care, clear and high-quality information, physical comfort including pain management, emotional support involvement of family members, continuity of care and accessibility.[10] In physiotherapy and rehabilitation, adopting a biopsychosocial perspective that encompasses these dimensions and emphasizes patient education is essential for achieving successful outcomes.[11,12]

To evaluate patient-centered care practices, several instruments have been developed. Examples include the Patient Assessment of Chronic Illness Care, the Health Services Outpatient Experience Questionnaire, the Quality of Patient-Centered Cancer Care, the Instrument for Assessing Patient Experience of Chronic Illness Care.[13-16] Among these, Client-Centered Rehabilitation Questionnaire (CCRQ) is particularly advantageous, as it was specifically designed for rehabilitation and captures multidimensional nature of this field.[17] Developed through a rigorous, patient-informed process, the CCRQ has demonstrated strong psychometric properties and has been successfully adapted in various cultural contexts.[17,18] Its multidimensional structure allows for detailed assessment of how client-centered principles are operationalized in practice, making it more sensitive to context and clinically relevant.

Despite these advances, no instrument has been available in Turkish to comprehensively assess patient-centered rehabilitation practices. Recognizing this gap, the primary objective of the present study was to translate the CCRQ into Turkish and ensure its cultural and linguistic appropriateness and to assess the reliability and validity of the translated questionnaire among patients receiving physiotherapy and rehabilitation services, thereby establishing its applicability as a standardized tool in both clinical practice and research. In addition, comparative analysis were planned to examine differences in Turkish version of CCRQ scores across patient characteristics.

The main research question of this study was whether the Turkish version of the CCRQ is a valid and reliable instrument for assessing patient-centered rehabilitation practices in Turkish-speaking populations.

Methods

Participants

Voluntary patients who applied to Medical Park Maltepe Hospital and underwent rehabilitation between January 2023 and January 2024 were included in this study. The study protocol was approved by the Ethics Committee of University of Marmara University Faculty of Health Sciences (Approval no: 201, Date: 29.12.2022). and adhered to the principles outlined in the Declaration of Helsinki. All participants were informed about the study details and provided written informed consent before participation.

The inclusion criteria were (i) being over 18 years of age and participating in a rehabilitation program for any reason and (ii) being proficient in Turkish language. Exclusion criteria were (i) being illiterate, (ii) having any mental health condition, aphasia, or comprehension difficulties, (iii) taking neurological or psychiatric medications, including antidepressants, anticonvulsants, and stimulant medications, (iv) being pregnant, (v) undergoing a different rehabilitation program between the first and second evaluations, and (vi) withdrawing from the study for any reason.

Instrument

The CCRQ was developed in English by Cott et al.[17] as one of the assessment tools designed to address various aspects of a case-oriented approach to rehabilitation. This self-assessment questionnaire aims to evaluate rehabilitation practices from the patient's perspective. It includes items that explore decision-making processes, patient participation, and comfort, as well as questions related to the clinic and its environment.[17] Each item is rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with an additional "not applicable" option. In this study, the subscale scores were calculated as mean of corresponding items, resulting in scores ranging from 1 to 5. Analyses were conducted at the subscale level in accordance with the multidimensional structure of the instrument.

Cott et al.[17] reported that all subscales have high internal consistency (0.72-0.87) and test–retest reliability (0.74-0.85) and the questionnaire is a valid and reliable tool for both clinical use and research purposes. Additionally, validity and reliability studies have been conducted to adapt the questionnaire for use in Spanish and Australian populations.[18,19] This 33-item questionnaire evaluates the extent to which individuals have received case-focused interventions during the rehabilitation process. It is organized into 7 subdomains: involvement in decision-making, case-focused education, assessment and outcomes from the case perspective, family involvement, emotional support, physical comfort, and coordination/continuity of care.

Process

The translation process adhered to the linguistic validation recommendations provided by the Mapi Research Institute. Permission from Cott et al. was obtained as the first step. In the second step, the forward translation was independently performed by 2 physiotherapists who were faculty members with strong English proficiency. After reviewing both translations, the authors developed a consolidated version. In the third step, the consolidated text was back-translated into English by a researcher with advanced English proficiency and a physiotherapist who had completed her education in an English-speaking country. Finally, the 4 researchers compared the finalized Turkish version of the CCRQ with both the original and back-translated English versions to ensure accuracy and consistency. To evaluate its comprehensibility, the final version of the questionnaire was administered to 20 healthy individuals as a pilot test. Suggestions from participants were taken into account and the results were assessed by the researchers. The decision was taken that the most suitable translation for "Client" would be "Olgu". Apart from this, there was not any other change. The participants agreed that the questionnaire was understandable, feasible and easy to answer.

The finalized questionnaire was administered all the participants and then re-administered to assess its test–retest reliability. The test–retest assessment was conducted with a 1-week interval to minimize recall bias while ensuring the stability of the measured construct, which is considered an appropriate interval.[20] Also, the demographic and clinical characteristics of the patients participating in the study were recorded using a questionnaire designed by the investigators. All patients completed the questionnaires individually in a supervised self-administration in a face to face clinical setting. Researcher provided standardized instructions when necessary but did not influence participants' responses.

Sample Size and Statistical Analyses

Based on the "item count x 5-10 times" rule sample size was calculated as 165.[21] Data analyses were performed using the IBM Statistical Package for Social Sciences version 24 (Chicago, USA). Continuous variables are presented as mean ± standard deviation, while categorical variables are expressed as frequencies and percentages (%). Floor and ceiling effects were determined by calculating the proportion of respondents who achieved the lowest or highest possible scores, respectively. Significant floor and ceiling effects were set at 15%.[20] Kaiser–Meyer–Olkin (KMO) test and the Barlett test were used to determine the suitability of data for the factor analysis. KMO value greater than 0.5 and a Barlett *P* values less than .05 were used for adequacy. An exploratory factor analysis (principal component analysis and oblimin oblique rotation) was conducted for construct validity. Cronbach's α coefficient was used to assess the internal reliability of the questionnaire. Test–retest reliability was assessed using the intraclass correlation coefficient (ICC) based on a two-way mixed-effects model with single measurements and absolute agreement [ICC(3,1)].

To compare the CCRQ scores of major diagnostic groups, Mann–Whitney *U*-test was used. Statistical significance was defined as $P < .05$ for all analyses.

Results

A total of 165 participants were initially assessed for eligibility. Of these, 136 participants who met the inclusion criteria and provided complete questionnaire data were included in the final analyses. There were 58 males (42.6%) and 78 females (57.4%). The mean age of participants was 50.85 ± 17.27 years.

The education level of 52 participants (39.7%) was elementary school level, 27 participants (20.6%) had middle school level, 29 participants (22.1%) had high school level, and 23 patients (17.5%) had higher education level.

Among the patients, 124 (91.2%) were receiving inpatient treatment. The median length of hospital stay for these patients was 15 days (interquartile range, 5-21 days).

The diagnosis of orthopaedic conditions was present in 75% of the participants, while 15% were diagnosed with neurological diseases (Table 1).

No floor or ceiling effects were observed, as less than 15% of participants achieved the lowest or highest possible scores.

Based on the exploratory factor analysis, the KMO score was 0.87, and Barlett's Sphericity Test showed significant results ($X^2 = 2349.21$, $P < .001$). The 7 factors with eigenvalues higher than 1 accounting for 63.29% of the total variance. Communalities measuring the variance of variables are systematically greater than 50%, and factor loadings were adequate and ranged from 0.53 to 0.77.

Intraclass correlation coefficient calculations for all subscales of the scale and all questions indicated good to excellent reliability (Tables 2 and 3). The highest ICC coefficient, 0.90, was found for the "Outcome evaluation from client's perspective" subscale, while the lowest ICC coefficient, 0.81, was found for the "Continuity/coordination" subscale.

Each subscale demonstrated good internal consistency reliability (0.829-0.872) (Table 2). While Cronbach's alpha coefficient of the first application of total TR.v.CCRQ score was 0.862, Cronbach's alpha coefficient of the second application was 0.88. The Corrected Item-Total Correlation values for the 7 subscales ranged from 0.51 to 0.75 (Table 2), indicating that all subscales were consistent with each other.

Table 1. Diagnostic Features of Patients

Diagnosis	n (%)	Diagnosis	n (%)
Orthopedics	89 (65.4)	Neurological	36 (26.5)
Adhesive capsulit	9 (6)	MS	2 (1)
Rotator cuff syndrome	5 (3)	Mononeuropathy	1 (0.7)
Shoulder impingement syndrome	9 (6)	Myopathy	1 (0.7)
Low back pain	4 (2)	Parkinson	2 (1)
LDH	12 (8)	Spina bifida	1 (0.7)
Lumbar stenosis	1 (0.7)	Post-polio	1 (0.7)
CDH	8 (5)	Spinal cord injury	1 (0.7)
Radius distal fracture	7 (5)	Paraplegia	2 (1)
Soft tissue trauma	3 (0.2)	Tetraplegia	1 (0.7)
Carpal tunnel syndrome	2 (1)	Hemiplegia	18 (13)
Elbow fracture	2 (1)	Cerebral palsy	1 (0.7)
Humerus fracture	2 (1)	Femoral nerve injury	1 (0.7)
Gonarthrosis	3 (0.2)	Sciatica nerve injury	1 (0.7)
Menisectomy	1 (0.7)	Drop foot	1 (0.7)
Meniscopathy	3 (0.2)	Facial paralysis	2 (1)
ACL repair	2 (1)	Rheumatological	1 (0.7)
ACL rupture	1 (0.7)	Rheumatoid arthritis	1 (0.7)
Tibia fracture	1 (0.7)	Cardiopulmonary	9 (6.6)
Wrist osteoarthritis	1 (0.7)	Lymphedema	2 (1)
Flexor tendon repair	1 (0.7)	CABG	6 (4)
Coxarthrosis	1 (0.7)	Cardiac valve transplantation	1 (0.7)
Hip artroplasty	1 (0.7)	Oncological	1 (0.7)
Congenital hip dislocation	1 (0.7)	Elbow tumor	1 (0.7)
Scoliosis	2 (1)		
Ankle fracture	1 (0.7)		
Calcaneal fracure	1 (0.7)		
Plantar fasciit	1 (0.7)		
Bone marrow edema	1 (0.7)		
Vertebral fracture	1 (0.7)		
Atrophy	1 (0.7)		
Gait disorder	1 (0.7)		

ACL, anterior cruciate ligament; CABG, coronary artery bypass grafting; CDH, cervical disc herniation; LDH, lumbal disc herniation; MS, multiple sclerosis.

When all questions were evaluated individually, the Corrected Item-Total Correlation values ranged from -0.16 to 0.68 (Table 3). According to the Squared Multiple Correlation (SMC) values, all items were well-explained by the other items, indicating that they were consistent with the overall structure of the scale (SMC > 0.3) (Table 3).

Test–retest analysis of CCRQ subscales indicated good-to-excellent internal consistency (Table 4). Spearman's rho correlation coefficient of subscales ranged between 0.70 and 0.84, while the all items of CCRQ evaluated, Spearman's rho correlation coefficient varied between 0.33-0.84, which indicated moderate-to excellent reliability (Table 4).

Figure 1 illustrates the 7 factor model, including factor loadings and squared multiple correlation coeffieicnts.

Based on the second application results, there was no statistical significant difference in CCRQ subscale scores between men and women ($P > .05$). In neurological patients group, scores of "Client participation in decision-making and goal-setting", "Client-centered education", "Family involvement", "emotional support and "physical comfort" subscales of CCRQ were higher than the scores of patients with orthopaedic conditions ($P < .05$). While there were not statistically significant difference in results of "Outcome evaluation from client's perspective" and "continuity and coordination" subscales between the neurological

Table 2. Reliability Analyses of Each Subscales of CCRQ

CCRQ Subscales	Item No	Corrected Item-Total Correlation	Squared Multiple Correction	Cronbach's Alpha Coefficient (a)	ICC	95% CI
Client participation in decision-making and goal-setting	1,6,9,15,20,25	0.75	0.61	0.82	0.87	0.82-0.91
Client-centered education	2,10,21,26,33	0.54	0.34	0.85	0.87	0.82-0.90
Outcome evaluation from client's perspective	3,11,16,22	0.71	0.60	0.83	0.90	0.86-0.93
Family involvement	4,12,17,23,27	0.51	0.36	0.87	0.84	0.78-0.89
Emotional support	5,13,28,31	0.66	0.48	0.84	0.85	0.80-0.90
Physical comfort	8,14,19,30	0.73	0.57	0.83	0.81	0.74-0.87
Continuity/coordination	7,18,24,29,32	0.63	0.46	0.84	0.81	0.73-0.86

CCRQ, Client-Centered Rehabilitation Questionnaire; ICC, intraclass correlation coefficients.

and orthopaedics ($P > .05$), the absolute scores were higher in scores of neurological patients (Table 5).

Discussion

The CCRQ was adapted to the Turkish language and the reliability for Turkish patients were examined in this study. The findings showed that The Turkish version of the CCRQ (TR.v.CCRQ) is an applicable instrument for Turkish patients. The high internal consistency (Cronbach's $\alpha > 0.86$) and excellent test–retest reliability (ICC ranging from 0.810 to 0.902) observed in this study align with the findings from previous adaptations of the questionnaire in other languages, such as Spanish and Australian versions.[18,19] These findings confirm the robustness of the questionnaire across diverse cultural and linguistic contexts.

Fundamental components of patient-centered strategies are effective communication and active collaboration between patients and health-care providers, enabling the development of individualized treatment goals aligned with patients' needs.[1,2,5] This approach enhances patient engagement in care, contributes to better adherence to treatment and regaining control over their health, especially in chronic or complex conditions. Including patients in the treatment process has been shown to improve clinical outcomes and reduced hospital stay duration.[11,12] Overall, these benefits represents central role of patient-centered care

Table 3. Reliability Analyses of Each Items of CCRQ

CCRQ Subscale	Item No	Corrected Item-Total Correlation	Squared Multiple Correction
Client participation in decision-making and goal-setting	1	0.29	0.36
	6	0.63	0.67
	9	0.68	0.67
	15	0.63	0.67
	20	0.51	0.60
	25	0.59	0.66
Client-centered education	2	−0.16	0.36
	10	0.50	0.49
	21	0.63	0.68
	26	0.60	0.66
	33	0.17	0.42
Outcome evaluation from client's perspective	3	0.48	0.51
	11	0.53	0.60
	16	0.58	0.57
	22	0.60	0.68
Family involvement	4	0.44	0.59
	12	0.58	0.67
	17	0.55	0.65
	23	0.54	0.74
	27	0.53	0.73
Emotional support	5	0.44	0.44
	13	0.51	0.61
	28	0.46	0.48
	31	0.43	0.40
Physical comfort	8	0.44	0.51
	14	0.45	0.50
	19	0.61	0.65
	30	0.60	0.6
Continuity/coordination	7	−0.09	0.32
	18	0.58	0.62
	24	0.43	0.54
	29	0.58	0.70
	32	0.55	0.59

CCRQ, Client-Centered Rehabilitation Questionnaire.

Table 4. Test–Retest Analyses of Each Items and Subscales of CCRQ

CCRQ Subscales	Item No	Rho	*P*	Rho	*P*
Client participation in decision-making and goal-setting	1	0.71	<.001*	0.81	<.001*
	6	0.67	<.001*		
	9	0.69	<.001*		
	15	0.83	<.001*		
	20	0.64	<.001*		
	25	0.62	<.001*		
Client-centered education	2	0.33	<.001*	0.80	<.001*
	10	0.75	<.001*		
	21	0.75	<.001*		
	26	0.71	<.001*		
	33	0.84	<.001*		
Outcome evaluation from client's perspective	3	0.81	<.001*	0.84	<.001*
	11	0.65	<.001*		
	16	0.78	<.001*		
	22	0.78	<.001*		
Family involvement	4	0.69	<.001*	0.73	<.001*
	12	0.69	<.001*		
	17	0.63	<.001*		
	23	0.77	<.001*		
	27	0.73	<.001*		
Emotional support	5	0.56	<.001*	0.77	<.001*
	13	0.56	<.001*		
	28	0.64	<.001*		
	31	0.75	<.001*		
Physical comfort	8	0.57	<.001*	0.70	<.001*
	14	0.67	<.001*		
	19	0.76	<.001*		
	30	0.66	<.001*		
Continuity/coordination	7	0.49	<.001*	0.73	<.001*
	18	0.73	<.001*		
	24	0.80	<.001*		
	29	0.78	<.001*		
	32	0.75	<.001*		

CCRQ, Client-Centered Rehabilitation Questionnaire.
Spearman's rho correlation coefficient was used for test–retest.
*$P < .05$.

and rehabilitation in modern healthcare systems as a comprehensive approach to achieving sustainable outcomes.[1,2,5]

Due to the growing emphasis on patient-centered rehabilitation, evaluating these processes has also gained importance. Since there is no existing specific assessment questionnaire in the Turkish language, the aim is to translate the CCRQ into Turkish. However, considering cultural differences, it was deemed more appropriate to translate the term "Client" as "Olgu (Case)" in Turkish. In terms of clinical utility, the TR.v.CCRQ fills a significant gap in Turkish healthcare by providing a standardized method to evaluate patient-centered rehabilitation practices. The findings of this study demonstrate the questionnaire's ability to capture key dimensions of patient-centered care, such as emotional support, involvement in decision-making, and coordination of care.

The absence of floor and ceiling effects suggested that Turkish version of CCRQ adequately captures a wide range of patient-centered rehabilitation experience without significant clustering at the extreme ends, thereby supporting the scale's suitability for use in this population. Cronbach's α was calculated as 0.86. The internal consistency of the Turkish version of the scale showed good reliability and the test–retest results showed good reliability (0.70-0.81). The Cronbach's α values for the 7 subscale scores ranged from 0.829 to 0.872. In the Australian version of the scale, Fisher and colleagues reported Cronbach's α values for the subscale scores ranging from 0.31 to 0.86. The researchers reported that when the items with low correlation coefficients, namely Items 2, 7, and 33, were removed, the value of 0.31 increased to 0.72, and the Cronbach's α value of 0.59 increased to 0.81.[19] In the Icelandic version, the researchers reported Cronbach's α values ranging between 0.72 and 0.91 for the subscales, while it was 0.92 for the total scale.[22]

Previous validation studies of the CCRQ have demonstrated that the factor structure of the instrument may vary across different cultural adaptations. While the original version developed by Cott et al. proposed a 7-factor structure, the German validation study identified more condensed 3-factor structure representing decision-making/communication, self-management/empowerment, and psychosocial well-being.[17,23] In the Spanish adaptation study, the original 7-domain structure was preserved; however, 4 items were removed from the original scale to achieve the final validated version. Similarly, the Australian validation study reported partial differences in factor loading compared with the original version, alongside improved psychometric performance after the exclusion of negatively worded items. In the present study, the overall 7-factor structure of the Turkish version was preserved, and the factor loading patterns appeared more consistent with findings from the Australian version. These results suggest that cultural and contextual factors may influence the structural organization and interpretation of CCRQ across different populations.

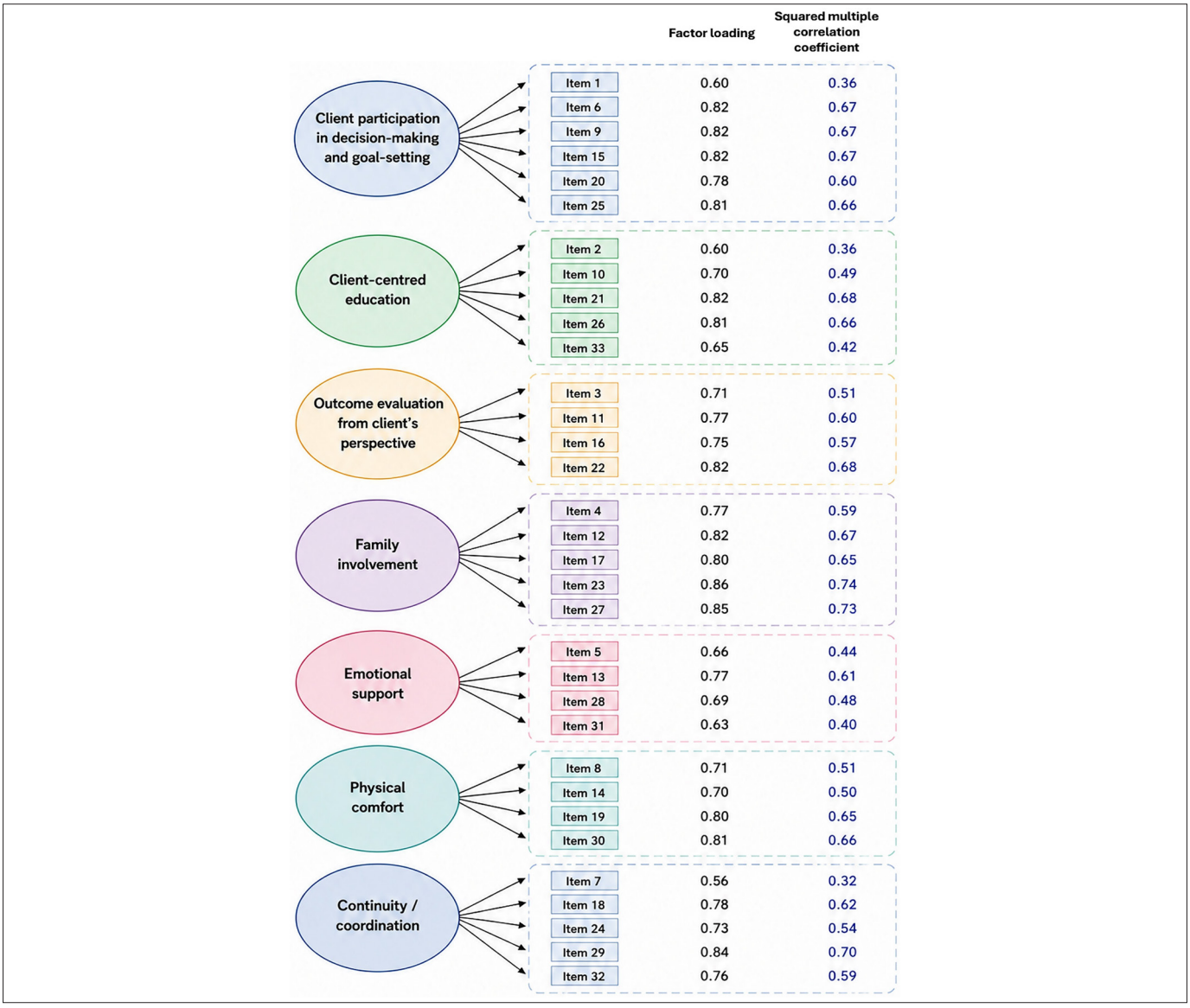


Figure 1. The 7 factor model with factor loadings and squared multiple correlation coefficients in the Turkish version of CCRQ. CCRQ, Client-Centered Rehabilitation Questionnaire.

Although the overall 7 factor structure of CCRQ was preserved, some item loading patterns differed from the original version and appeared more consistent with findings reported in the Australian validation study. These variations may reflect cross-cultural differences in the interpretation of patient-centered rehabilitation experiences.

In the present study, when the scale items were individually examined, we found that the Corrected Item-Total Correlation values for Items 1 and 33 were below 0.3, indicating that these items did not represent the construct the test aimed to measure well. For Items 2 and 7, the Corrected Item-Total Correlation values were negative, suggesting that

Table 5. Comparison of CCRQ Subscales Between Orthopedic and Neurologic Groups

		Orthopedics		Neurologicals		
CCRQ Subscales	**Item No**	**Median**	**IQR (25/75)**	**Median**	**IQR (25/75)**	***P***
Client participation in decision-making and goal-setting	1,6,9,15,20,25	1.33	(1/1.95)	1.66	(1.33/2)	.027*
Client-centered education	2,10,21,26,33	1.50	(1/2)	2.40	(2.20/2.60)	.026*
Outcome evaluation from client's perspective	3,11,16,22	1.50	(1/2)	2	(1.06/2.18)	.224
Family involvement	4,12,17,23,27	1	(0.40/1.40)	1.40	(1/2)	.006*
Emotional support	5,13,28,31	1	(1/1.25)	1.50	(1.06/2)	<.001*
Physical comfort	8,14,19,30	1.25	(1/1.25)	1.50	(1/2)	.011*
Continuity/coordination	7,18,24,29,32	1.80	(1.60/2.40)	2.10	(1.65/2.40)	.243

CCRQ, Client-Centered Rehabilitation Questionnaire; IQR, inter quartile range.
Mann–Whitney *U*-test.
*$P < .05$.

these items could negatively impact the test results. In the current study, these items were not removed, and the analyses was conducted without their exclusion in order to preserve the conceptual integrity of CCRQ. The relatively lower performance of these items may reflect subtle linguistic nuances introduced during the translation process or cultural differences in patients' expectations and experiences regarding communication, information sharing, and coordination rehabilitation services. Similar variations in item performance have been reported in previous cross-cultural adaptations of the CCRQ, suggesting that patient-centered rehabilitation concepts may be interpreted differently across healthcare settings and cultural contexts.

Körner and colleagues also conducted the validation study of the German version of the CCRQ questionnaire, and similarly, the researchers reported that "the 3 negatively worded items, namely Items 2, 7, and 33, exhibited insufficient loadings (of a maximum of 0.55)."[23] In the study, Corrected Item-Total Correlation value was low in item 1, although it did not contain negative expressions. Since this is the first question or because it is a long question, it may be difficult for patients to understand. Körner et al. reported that the 7 scales of the CCRQ proposed by Cott et al. could not be reproduced through factor analysis in a large sample of German medical rehabilitation patients. Instead, 3 alternative scales were identified: "Decision-Making / Communication," "Self-Management / Empowerment," and "Psychosocial Well-Being."[17,22]

The comparative analysis across the patient subgroups suggest potential variability in CCRQ scores across patient characteristics, although these findings were secondary to the main study aim.

Strengths and Limitations

The current study has some limitations. The sample was drawn from a single hospital, and the majority of patients had orthopaedic conditions, which may limit the generalizability of the results to other healthcare settings. In addition, although the final sample size was supported by acceptable KMO and Bartlett's test results, it was slightly below the commonly recommended 5 participants per item threshold. Therefore, the factor structure of the Turkish CCRQ should be confirmed in future studies with larger and more diverse samples. The lack of longitudinal data prevents the assessment of how patient perceptions of care might change over time or after specific interventions. Individuals using neurological and psychiatric medications were excluded to minimize potential confounding effects on cognitive processing and self-report responses. However, this approach may also limit the generalizability of the findings. Additionally, other medication use was not systematically recorded, which should be considered when interpreting the results. Furthermore, convergent and divergent validity analyses were not conducted due to the absence of a validated Turkish instrument assessing a similar construct at the time of data collection. Future studies should address these limitations by including larger and more diverse samples, exploring the questionnaire's responsiveness to clinical changes, and using appropriate comparator measures, and investigating clinically meaningful reference values or interpretive thresholds for specific rehabilitation populations, such as individuals with chronic pain, musculoskeletal, or neurological conditions. Establishing such values could facilitate the interpretation of Turkish CCRQ scores and support clinical decision making and longitudinal patient monitoring. Evaluating the questionnaire across diverse clinical settings and through repeated assessments over time or before and after interventions would provide further evidence of its responsiveness and applicability in routine rehabilitation practice and would enable clinicians and researchers to understand changes in perceptions of ongoing care. Such insights can inform more personalized care approaches in line with patient-centered care. In addition, we recommend the cross-cultural adaptation and psychometric assessment of the 20-item short form developed by Körner et al. in future studies.[22] If comparable psychometric properties are demonstrated, the shorter version may facilitate the routine evaluation of patient-centered rehabilitation while reducing respondent burden.

Conclusion

This current study demonstrated that the TR vs CCRQ is a valid and reliable instrument for evaluating patient-centered rehabilitation practices in Türkiye. Its implementation in clinical and research settings has the potential to enhance the quality of rehabilitation services by promoting individualized and holistic care approaches. Further research should focus on using this tool to assess the impact of patient-centered care interventions on long-term health outcomes.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Artificial Intelligence Usage Statement: This study used ChatGPT to improve language editing. No AI tool was not used to data analysis, interpretation or generation of scientific content.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of University of Marmara University Faculty of Health Sciences (Approval no: 201, Date: December 29, 2022).

Informed Consent: Written informed consent was obtained from the patients/patient who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – T.Ö.U., T.K.Ç.; Design – T.Ö.U., T.K.Ç.; Supervision – T.K.Ç., İ.Ç.; Resources – T.Ö.U., T.K.Ç., İ.Ç.; Materials – T.Ö.U., T.K.Ç., B.Ö.; Data Collection and/or Processing – T.Ö.U., T.K.Ç., B.Ö., E.E.D., İ.Ç.; Analysis and/or Interpretation – T.Ö.U., T.K.Ç., E.E.D., B.Ö.; Literature Search – T.Ö.U., T.K.Ç., E.E.D., B.Ö., İ.Ç.; Writing – T.Ö.U., T.K.Ç., E.E.D., B.Ö., İ.Ç.; Critical Review – T.Ö.U., T.K.Ç.

Declaration of Interests: The authors declare that they have no competing interest.

Funding: The authors declare that this study received no financial support.

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