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Psychometric Evaluation of the Perception of Humanized Nursing Care Behaviors Instrument (PCHE-III): An Analysis Based on CTT and IRT

LUZ NELLY RIVERA-ÁLVAREZ
Universidad Nacional de Colombia

HANS WALTER ACERO-DE LA PARRA
Universidad Manuela Beltrán

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Correspondence: Luz Nelly Rivera-Álvarez (orcid.org/0000-0001-8750-1155). Email: lnriveraa@unal.edu.co

SCIENTIFIC RESEARCH ARTICLE

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Abstract

Introduction: Humanization in healthcare is essential to ensure patients' dignity and well-being. Reliable instruments are required to measure this concept and guide improvements in care quality. **Objective:** To analyze the psychometric properties of the Perception of Humanized Nursing Care Behaviors Instrument 3rd version (PCHE-III), based on the Classical Test Theory (CTT) and the Item Response Theory (IRT). **Methodology**: Quantitative, descriptive, inferential and instrumental study. Databases from two research studies using the PCHE-III (*n*=845 data) were analyzed. CTT and IRT psychometric techniques were applied. **Results:** According to Classical Test Theory (CTT), the PCHE-III showed high reliability (*Cronbach's alpha*= 0.979; *McDonald's omega*= 0.981). Meanwhile, under IRT, the 2PL and PCM models indicated reliability of 0.835 and low item difficulty. Exploratory Factor Analysis identified three dimensions (*variance explained*= 73.9%, *KMO*= 0.980). **Conclusions:** The psychometric robustness of the PCHE-III and its construct validity on three dimensions aligned with Jean Watson's theory are confirmed.

Keywords: psychometrics, humanization of assistance, validation study, nurse-patient relations. professional-patient relations.

Evaluación psicométrica del instrumento Percepción de comportamientos de cuidado humanizado de enfermería (PCHE-III): Un Análisis desde la TCT y la TRI

Resumen

Introducción: La humanización en salud es fundamental para garantizar la dignidad y el bienestar de los pacientes. Para medirla, es necesario contar con instrumentos precisos que orienten mejoras en la atención. **Objetivo**: Analizar las propiedades psicométricas del instrumento Percepción de Comportamientos de Cuidado Humanizado de Enfermería 3ª versión (PCHE-III), desde la Teoría Clásica del Test (TCT) y la Teoría de Respuesta al Ítem (TRI). **Metodología:** Estudio cuantitativo, descriptivo, inferencial e instrumental. Se analizaron bases de datos de dos investigaciones que emplearon el PCHE-III (*n*= 845 datos). Se aplicaron técnicas psicométricas de la TCT y la TRI. **Resultados:** Desde la TCT, el PCHE-III mostró alta fiabilidad (*Alfa de Cronbach*= 0.979; *Omega de McDonald*= 0.981). Desde la TRI, los modelos 2PL y PCM indicaron confiabilidad de 0.835 y baja dificultad en los ítems. El Análisis Factorial Exploratorio identificó tres dimensiones (*varianza explicada*= 73.9%, *KMO*=0.980). **Conclusiones:** Se confirma la solidez psicométrica del PCHE-III y su validez de constructo en tres dimensiones alineadas con la teoría de Jean Watson.

Palabras clave: psicometría, estudio de validación, humanización de la atención, relaciones enfermero-paciente, relaciones profesional-paciente.

Introduction

HUMANIZATION IN healthcare has been recognized as a pivotal goal aiming to ensure the dignity and well-being of patients. The World Health Organization (WHO) defines it as a process in which people communicate and support each other with the purpose of understanding and improving the human experience in healthcare (cited by Bautista et al., 2015). In Colombia, this concept has been integrated into legislation since the Political Constitution (Colombia, 1991), which establishes the safeguarding of human dignity as one of the bases of the Social State of Law. It has also been promoted through Act 100 (1993), the Statutory Health Act (Act 1751, 2015), and the Comprehensive Health Care Policy —Ministry of Health and Social Protection, 2016—, that consider individuals and their dignity to be at the center of the health system, characterized by a person-focused approach.

Despite regulatory advances that establish the humanization of care as an ethical obligation, challenges remain in clinical practice that hinder the consolidation of a culture of humanization. Among the difficulties identified by the National Policy for Humanization in Health 2021-2031 (Ministry of Health and Social Protection, 2020) are the excessive workload of healthcare staff, which compromises ethical and care quality, and the fragmentation of care based on organs, diseases, or administrative procedures, that limits a comprehensive understanding of the person. Likewise, there are evident gaps in emotional, communication, and interpersonal skills training for healthcare professionals in emotional, communication, and interpersonal skills, along with deficiencies in job stability and a shortage of health personnel, factors that increase work fatigue and the risk of inadequate treatment of patients and their environment (Hoyos et al., 2008, as cited in Ministry of Health and Social Protection, 2020; Ombudsman's Office, 2020, as cited in Ministry of Health and Social Protection, 2020). Furthermore, academic instruction remains centered on a biomedical and technical-scientific approach, disconnecting itself from the human aspect (Haidet, Dains, Paterniti, Hechtel, Chang, and Tseng, 2002, cited by the Ministry of Health and Social Protection, 2020). These barriers limit the quality of care and affect the therapeutic relationship between professionals and patients.

These documented challenges within Colombia's health policies highlight the urgent need for structural changes in health institutions and practices, grounded in a humanizing approach. However, humanization in health is a multifaceted and multidimensional concept that must be addressed from different disciplines and perspectives. Henao-Castaño, Vergara-Escobar & Gómez-Ramírez (2021), analyzed the concept of humanization in healthcare, identifying related terms as: Humanized Care, Humanized Attention, Humanized Health, among others. Despite their conceptual differences, the authors highlight that they share the objective of establishing reciprocal and comprehensive interpersonal relationships based on the dignity, integrity, and autonomy of the people involved in the therapeutic relationship.

Healthcare humanization is tied to essential skills as empathy, compassion, dignified treatment, solidarity, and respect (Gonçalves De Oliveira, Collet & Viera, 2006; Chernicharo, Freitas & Ferreira, 2013, cited by Henao-Castaño, Vergara-Escobar & Gómez-Ramírez, 2021) are demonstrated through communication and empathetic understanding, —together with ethics— forming the foundational pillars of humanized care (Henao-Castaño, Vergara-Escobar, & Gómez-Ramírez, 2021).

Previous research has shown that humanized care promotes physical and emotional closeness between patients, their families, and healthcare personnel (Galvin et al., 2018, cited by Pérez-Fuentes, Herrera-Peco, Molero, Oropesa, Ayuso-Murillo, and Gázquez, 2020; Díaz-Rodríguez, Alcántara, Aguilar, Puertas, & Cano, 2020). Along these lines, Siles (2018) argues that the humanization of care transcends the technical and technological domain, emphasizing the relational dimension of care. Thus,

healthcare professionals are required to develop communication, emotional, and interpersonal skills that enable them to provide comprehensive care, respecting the physical, mental, and emotional dignity and well-being of patients (Díaz-Rodríguez et al., 2020; Pérez-Fuentes, Molero, Peco, Oropesa & Gázquez, 2019).

From a psychological perspective, humanization involves strengthening interpersonal processes and personal skills that are essential for professional practice (Pérez-Fuentes et al., 2019). Empathy and emotional intelligence play a crucial role in the humanization of healthcare, and it has been concluded that healthcare professionals need to develop emotional skills to address patients' needs with sensitivity and deal effectively with the stressful situations inherent in their profession (Pérez-Fuentes et al., 2020).

Taken together, these findings underscore, on the one hand, the importance of promoting the training and strengthening of communication, emotional, and empathic skills in healthcare professionals as an integral part of education and professional development, with the aim of ensuring more human-centered healthcare that benefits both patients and professionals themselves (Díaz-Rodríguez, et al., 2020; Pérez-Fuentes et al., 2020). On the other hand, they highlight the urgent need to place the patient at the center of the system, actively collaborating with healthcare professionals in preserving their well-being (Suazo, Pérez-Fuentes, Molero, Martos, Simón, Barragán, Sisto, and Gázquez, 2020).

In this context, having instruments to measure patients' perception of humanized healthcare is crucial, hence the need for this research. Among the most well-established instruments in the Colombian setting is the Perception of Humanized Nursing Care Behaviors Instrument 3rd Version (PCHE-III), based on Jean Watson's Theory of Human Caring. It has undergone extensive validation across diverse Latin American contexts and disciplines —including dentistry (Gijón-Alvarado and Müggenburg-Rodríguez, 2019; Rivera-Alvarez and Triana, 2023).

Therefore, this research holds significant value given the pressing need to enhance healthcare quality and the recognition of person-centered care as an ethical responsibility —a principle supported by multiple regulations (Act 1751, 2015; Ministry of Health and Social Protection, 2016, 2018, 2020). However, most tools used to assess healthcare quality have been developed in cultural contexts outside Colombia, underscoring the need for psychometrically robust and culturally relevant instruments.

Although the PCHE-III has been previously validated in multiple studies, most have relied on Classical Test Theory (CTT), which carries inherent limitations, as the inability to provide a complete view of the properties of the items and the skills of those evaluated (Attorresi, Lozzia, Abal, Galibert, & Aguerri, 2009). Therefore, there is a need to apply complementary approaches as Item Response Theory (IRT) to obtain a more detailed and accurate analysis. Accordingly, this study aims to analyze the PCHE-III's psychometric properties through both Classical Test Theory (CTT) and IRT, addressing the question: What are the PSYCHOMETRIC properties of the "Perception of Humanized Nursing Care Behaviors Instrument" —pche 3rd version' according to Classical Test Theory and Item Response Theory?

Finally, the research is justified by its theoretical and methodological relevance. Theoretically, it contributes to the understanding of the phenomenon of humanization; methodologically, it contributes to psychometrics by generating more accurate instruments that are better suited to the clinical and social reality of Colombia. In addition, it recognizes the role of psychology in the training of health professionals, promoting communication, emotional, and interpersonal skills essential for more humanized care, as well as the development of psychometric skills for the adaptation and measurement of instruments in different health contexts.

Methodology

A psychometric research grounded in a quantitative approach with descriptive and inferential scope. An instrumental research design was adopted. This design refers to studies that develop (or adapt) (Montero & León, 2002, 2005) and examine the psychometric properties of psychological assessment tools (Ato, López, & Benavente, 2013). Given the computational data analysis nature of the study, the population and sample comprise datasets from two prior studies that used the Perception of Humanized Nursing Care Behaviors Instrument (PCHE-III) and authorized its use for this research. The study population consists of datasets from these two studies, selected via non-probabilistic convenience sampling, totaling 845 records.

The instrument —Perception of Humanized Nursing Care Behaviors Instrument, 3rd version (PCHE-III)— measures the "humanized care" phenomenon. It demonstrates a content validity of 0.98, construct validity of 0.956, and Cronbach's α of 0.96 (Rivera & Triana, 2023). For data analysis, psychometric techniques from Classical Test Theory (CTT) were employed, including exploratory and confirmatory factor analysis and internal consistency reliability, as well as analysis based on Item Response Theory (IRT), examining logarithmic curves, item abilities, and item difficulty. The psychometric analysis was conducted using the statistical software Jamovi (version 2.3). For CTT-based analysis, the Factor Reliability Analysis module was used, while for IRT, the Snow IRT module and the Partial Credit Model (PCM) (The Jamovi Project, 2022) were utilized.

As a psychology-focused study, this investigation adheres to the principles governing the practice of psychology in Colombia under Act 1090 (2006). These principles guided ethical and professional conduct throughout the research process, ensuring methods and practices aligned with the discipline's core values. Additionally, the study follows ethical standards outlined in Resolution 8430 of 1993, particularly regarding computerized data management and software design. This research entails no risks, as it involves database analysis without direct human participation. It received approval from the Ethics Committee of the Psychology Department at Universidad Manuela Beltrán (Approval CE-PS-248, March 11, 2024). Compliance with Data Protection Act 1581 (2012) ensures personal data protection under principles of legality, accuracy, transparency, security, confidentiality, and purposefulness. The research serves a legitimate purpose: knowledge generation and scientific production, per Law Act 1581 (2012).

Results

Psychometric analysis of the PCHE-III instrument using Classical Test Theory (CTT) and Item Response Theory (IRT) contrasts properties across methodological approaches. CTT yielded a Cronbach's Alpha of 0.979 and McDonald's Omega of 0.981 (Table 1), indicating high internal consistency. However, CTT does not assess individual item performance. According to Celina and Campos (2005) and George and Mallery (cited in Carvajal et al., 2011), reliability > 0.9 is considered excellent.

Table 1
Reliability Analysis of PCHE-III (from CTT)

Scale	Cronbach's α	McDonald's ω
Full Scale	0.979	0.981

In contrast, the analysis using Item Response Theory (IRT) employed the Two-Parameter Logistic Model (2PL) and its polytomous Rasch version, showed a reliability of 0.835 (Table 2), indicating good reliability. Values >0.8 denote adequate reliability, while > 0.9 are excellent. Here, 0.835 suggests sufficient precision for latent variable assessment and item consistency (i.e., replicable across similar item sets).

Table 2
Reliability of PCHE-III (in IRT)

	Model Fit
	Person Reliability
Scale	0.835

To assess the construct validity of the PCHE-III instrument, an Exploratory Factor Analysis (EFA) was conducted based on Classical Test Theory (CTT). The appropriateness of this technique was determined using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. According to Carvajal et al. (2011), the KMO index evaluates the degree of intercorrelation among variables; it is considered acceptable when exceeding 0.7 and optimal as it approaches 1. Bartlett's test of sphericity, on the other hand, verifies whether significant correlations exist between variables, justifying the application of factor analysis. For this analysis to be viable, a significance level below 0.05 is required. In line with these criteria, this study obtained a KMO value of 0.980 and a Bartlett's test significance level of 0.000 (see Tables 3 and 4), confirming the suitability of the Exploratory Factor Analysis (EFA).

Table 3
Bartlett's Sphericity Test

χ^2	gl	p
30451	496	< .001

Table 4
KMO Sampling Adequacy

	MSA
Global	0.980

Therefore, the Exploratory Factor Analysis (EFA) conducted via Principal Component Analysis (PCA) on the PCHE-III instrument revealed a three-factor structure. This suggests that humanization, as the phenomenon under study, can be explained through these identified dimensions. The total variance accounted for reached 73.9%, indicating that these three factors represent a significant proportion of the variability in humanization. Specifically, the first factor accounts for 62.9% of the variance and has a significantly higher eigenvalue (20.128); the second factor accounts for 6.09%, with an eigenvalue of 1.951; and the third factor accounts for 4.8%, with an eigenvalue of 1.566 (see Table 5).

Table 5
Eigenvalues and Variance Explained

Component	Eigenvalue	% Variance	% Cumulative
1	20.128	62.899	62.9
2	1.951	6.096	69.0
3	1.566	4.895	73.9
4	1.038	3.245	77.1
5	0.599	1.871	79.0

The component matrix, rotated using the Varimax method, allowed for better grouping of items within each factor, facilitating their interpretation and the identification of the dimensions comprising the concept of Humanized Care in this study (see Table 6). In this sense, high factor loadings (generally above 0.4) indicate that an item is well represented within a specific factor. However, item 12 shows a low factor loading of 0.341 on factor 2 and does not load significantly on the other factors.

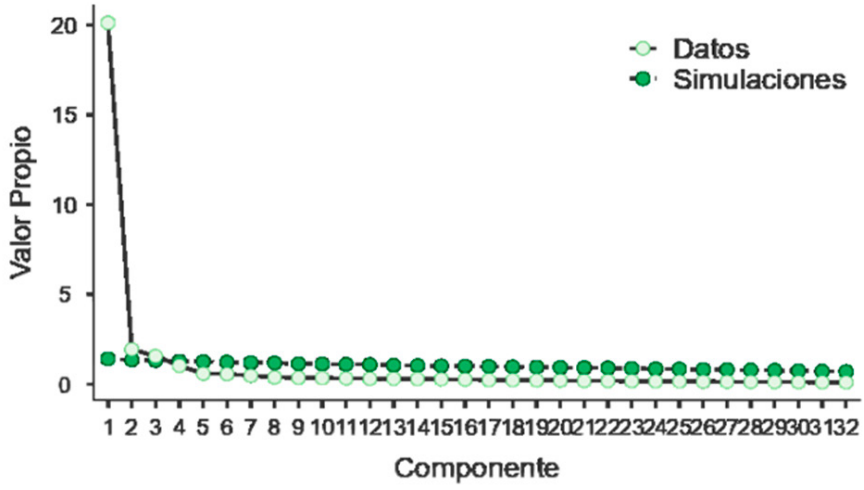
Table 6
Factor Loadings for PCHE-III Components (Varimax Rotation)

	Component			
	1	2	3	Uniqueness
IN1		0.705	0.426	0.301
IN2		0.756	0.421	0.216
IN3	0.399	0.733		0.215
IN4	0.366	0.723		0.301
IN5	0.528	0.697		0.219
IN6	0.438	0.753		0.192
IN7	0.468	0.724		0.205
IN8	0.476	0.689		0.229
IN9	0.587	0.647		0.211
IN10	0.314	0.598		0.456
IN11	0.435	0.648	0.302	0.299
IN12		0.341		0.850
IN13	0.595	0.615		0.230
IN14	0.745	0.345		0.251
IN15	0.684	0.368	0.386	0.248
IN16			0.753	0.292
IN17			0.776	0.279
IN18	0.663	0.303	0.438	0.277
IN19	0.727	0.340	0.352	0.232
IN20	0.651	0.325	0.462	0.257
IN21	0.809			0.197
IN22	0.701		0.369	0.285
IN23	0.838			0.169
IN24	0.676	0.345	0.459	0.214
IN25	0.795	0.366		0.171
IN26	0.739	0.344	0.402	0.175
IN27	0.387	0.335	0.680	0.276
IN28	0.570	0.355	0.611	0.175
IN29	0.463	0.378	0.645	0.227
IN30	0.497		0.622	0.282
IN31			0.815	0.196
IN32			0.806	0.227

Note. The 'Varimax' rotation was used.

Additionally, the scree plot reinforces the existence of these three factors, as a sharp decline in explained variance is observed after the third eigenvalue, validating the selection of the number of factors (see Figure 1).

Figure 1.
Factor Determination Using the PCHE-III Scree Plot.



Based on the IRT analysis, regarding the assessment of item difficulty using the logit scale, Table 10 shows that all values in the Measure column are negative for item difficulty estimates. Negative values correspond to less difficult items, while positive values represent more difficult items. The least difficult item is IN1 (value: -3.86), positioning it as the easiest on the scale. Conversely, IN12 registers a value of -1.97, making it the most difficult item. In evaluating item fit to the Two-Parameter Logistic Model (2PL), both Infit and Outfit values for all PCHE-III items fall within the expected range of 0.7 to 1.3, indicating adequate fit to the model for most items (Table 7).

Table 7
Fit Indices Under the Two-Parameter Logistic Model (2PL)

	Measure	S.E.Measure	Infit	Outfit
IN1	-3.86	0.0772	1.064	0.640
IN2	-3.65	0.0739	0.859	0.627
IN3	-3.13	0.0674	0.817	0.655
IN4	-3.09	0.0670	1.104	1.221
IN5	-2.83	0.0648	1.013	0.828
IN6	-3.16	0.0678	0.771	0.798
IN7	-3.23	0.0684	0.739	0.613
IN8	-3.18	0.0680	0.771	0.612
IN9	-2.87	0.0651	0.828	0.543
IN10	-3.37	0.0700	1.233	1.575
IN11	-3.32	0.0695	0.796	0.687
IN12	-1.97	0.0601	4.148	5.040

	Measure	S.E.Measure	Infit	Outfit
IN13	-2.96	0.0659	0.744	0.618
IN14	-3.01	0.0663	0.967	0.604
IN15	-2.97	0.0660	0.747	0.558
IN16	-3.83	0.0766	1.159	1.069
IN17	-3.97	0.0791	1.159	0.872
IN18	-2.97	0.0659	0.886	0.851
IN19	-2.84	0.0648	0.779	0.765
IN20	-2.95	0.0657	0.770	0.708
IN21	-2.49	0.0625	1.026	0.926
IN22	-2.63	0.0634	0.882	0.985
IN23	-2.21	0.0611	1.082	0.820
IN24	-2.94	0.0657	0.646	0.534
IN25	-2.36	0.0618	0.930	0.573
IN26	-2.87	0.0651	0.636	0.496
IN27	-3.40	0.0705	0.943	0.855
IN28	-3.35	0.0699	0.571	0.319
IN29	-3.32	0.0695	0.747	0.488
IN30	-3.32	0.0695	0.873	0.932
IN31	-3.78	0.0758	1.133	0.747
IN32	-3.78	0.0758	1.160	1.162

Nota. Infit= Information-weighted mean square statistic; Outfit= Outlier-sensitive means square statistic.

Infit values indicate that, overall, the items demonstrate adequate fit within the expected range (0.7–1.3). However, item IN10 (Infit = 1.233) exhibits slight additional variability, while IN12 (Infit = 4.148) shows poor fit, suggesting it may measure a different construct. Regarding Outfit values, most items align with the model, though some display deviations. Item IN10 (Outfit = 1.575) indicates unexpected response variability, while IN12 (Outfit = 5.040) reveals significant divergence, suggesting measurement inconsistencies. These findings highlight the need to revise these items to enhance their psychometric precision. Under the Partial Credit Model (PCM), the Delta-Tau parametrization models the probability of an individual responding to a specific category of a polytomous item. The Delta (δ) parameter represents the overall difficulty of each item on the logit scale. In this model each item has multiple difficulty parameters, assigning a distinct threshold to each transition between categories. Here, negative values indicate items with lower difficulty, while positive values correspond to items with higher difficulty. In the analyzed data, most items show negative values, suggesting participants responded to them with minimal difficulty (see Table 8). Additionally, a progressive pattern in transition difficulty between response categories was identified. The first transition (Tau 1) is the most accessible for participants, reflecting low demand to advance from the lowest category to the next. In contrast, the final transition (Tau 3) displays the highest values, indicating greater reluctance to select the most extreme option. This behavior suggests participants tend to prefer intermediate responses, potentially related to item phrasing or subjective perception of the assessed construct.

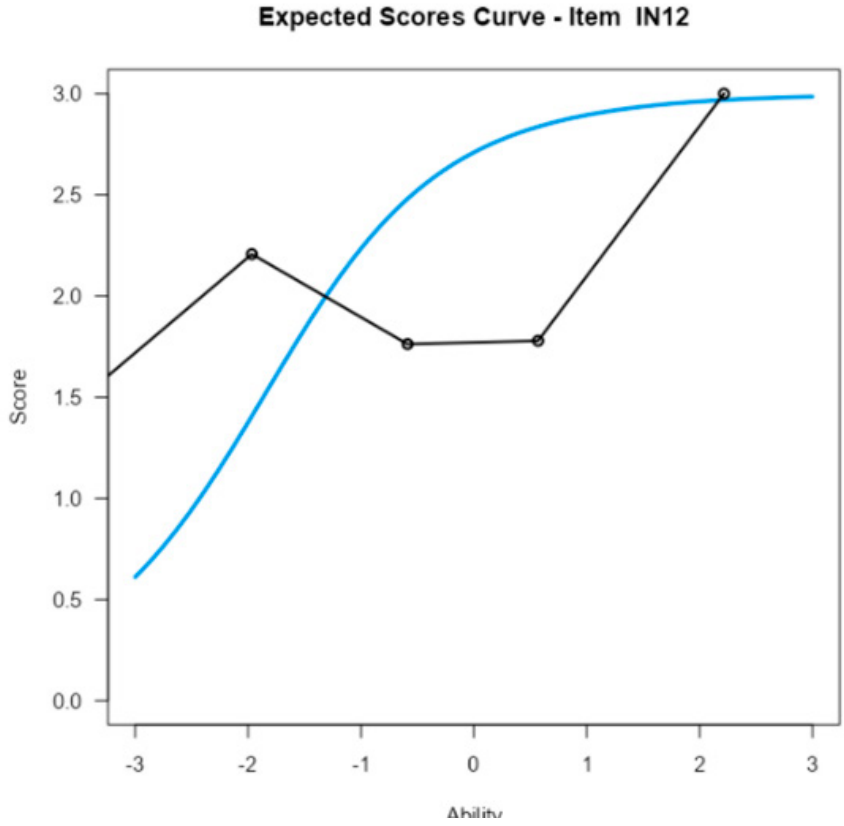
Table 8
Delta-Tau Parametrization in the Rasch Partial Credit Model

		Tau parameters		
	Measure	**1**	**2**	**3**
IN1	-4.08	-2.014	0.7344	1.280
IN2	-3.98	-2.127	0.5144	1.613
IN3	-3.20	-1.611	0.3884	1.223
IN4	-3.17	-1.687	0.4985	1.188
IN5	-2.78	-1.227	0.2360	0.991
IN6	-3.34	-1.863	0.4267	1.437
IN7	-3.45	-1.986	0.4802	1.506
IN8	-3.33	-1.857	0.6421	1.215
IN9	-2.95	-1.719	0.6277	1.092
IN10	-3.40	-1.465	0.3123	1.152
IN11	-3.54	-1.945	0.4546	1.490
IN12	-1.88	-0.693	0.0764	0.616
IN13	-3.21	-2.147	0.7156	1.432
IN14	-2.92	-1.151	0.5051	0.646
IN15	-3.07	-1.749	0.5834	1.165
IN16	-3.69	-1.081	0.3235	0.758
IN17	-3.83	-1.183	0.5129	0.670
IN18	-2.97	-1.375	0.2559	1.119
IN19	-2.84	-1.355	0.1197	1.235
IN20	-2.94	-1.233	-0.1268	1.359
IN21	-2.43	-1.114	0.2829	0.831
IN22	-2.74	-1.808	0.3475	1.460
IN23	-2.11	-0.812	0.1168	0.695
IN24	-3.03	-1.647	0.2373	1.410
IN25	-2.26	-0.859	0.3231	0.536
IN26	-2.96	-1.760	0.6320	1.128
IN27	-3.40	-1.416	0.4107	1.005
IN28	-3.39	-1.450	0.2293	1.221
IN29	-3.33	-1.421	0.3009	1.120
IN30	-3.29	-1.153	-0.0522	1.205
IN31	-3.55	-0.787	0.1889	0.598
IN32	-3.60	-0.855	0.0228	0.833

In both, the Partial Credit Model (PCM) and the Two-Parameter Logistic Model (2PL), item IN1 is positioned as the easiest, with values of -4.08 in the Rasch model and -3.86 in the 2PL model. Similarly, item IN12 is identified as having the highest relative difficulty in both approaches, with values of -1.88 in the Rasch model and -1.97 in the 2PL model. This consistency in results reinforces the stability of the difficulty estimates across different IRT models.

Regarding the analysis of the Item Characteristic Curves (ICCs) for the items of the PCHE-III instrument, item IN12 shows evidence of poor model fit, as indicated by its high infit (4.148) and outfit (5.040) values. This suggests that the item may be functioning atypically or measuring a different latent trait than intended. Graphically, its ICC displays irregularities in shape, reflecting low discrimination ability among examinees at different proficiency levels. Simultaneously, the observed resistance at the response threshold reinforces the notion that this item does not follow the same behavioural pattern as the others, which could undermine its validity within the instrument (see Figure 2).

Figure 2.
Item Characteristic Curve (ICC) for Item 12.



From Classical Test Theory (CTT), it is observed that removing this item would improve Cronbach's Alpha to 0.981 and McDonald's Omega to 0.982. Furthermore, the uniqueness analysis shows that item IN12 has a high value (0.850), indicating that its variance is not significantly explained by the identified factors and that its fit to the model is inadequate.

Discussion

Throughout its three versions, the PCHE has undergone rigorous validation processes that have consolidated it as a precise tool for measuring the phenomenon of humanized nursing care, in close alignment with Jean Watson's philosophical principles. In this regard, research as González (2015) in the Colombian context reported significant reliability values for the PCHE-III instrument, with a Cronbach's Alpha of 0.96. Similarly, in Chile, Melita, Jara, Pereira, and Luengo (2018) conducted the cross-cultural adaptation of the instrument for the Chilean population, obtaining a Cronbach's Alpha of 0.93, supporting its internal consistency across different contexts. These results are consistent with the Cronbach's alpha (0.979) and McDonald's omega (0.981) coefficients obtained in the present study, indicating excellent reliability and high internal consistency.

Likewise, the face and content validity analyses of the PCHE-III have been evaluated in various studies. González (2015), using an expert judgment technique with eight specialists in the phenomenon under study, assessed the instrument based on criteria of clarity, precision, comprehension, relevance, and pertinence. The results showed a facial validity index of 0.92 and a content validity index (CVI) of 0.98.

Notably, Roa (2022) used the PCHE-III to measure the psychosocial dimension in her doctoral thesis titled Basic Nursing Care: Relationship Between Physical, Psychosocial, and Relational Dimensions, a quantitative, correlational, cross-sectional study with a sample of 406 participants. In this study, the psychosocial dimension was defined according to Kitson et al. (2013) as the set of interactions that "includes communication (verbal and non-verbal), keeping the patient involved and informed, dignified, respected, educated, with emotional well-being, and with respected values and beliefs" (cited by Roa, 2022, p. 19). In this research, five experts evaluated the PCHE-III based on the criteria of clarity, coherence, relevance, and sufficiency, using the modified Lawshe index, Aiken's V coefficient, and Fleiss' Kappa statistic (Roa, 2022). According to the Lawshe index, perfect agreement (1.00) was obtained for all evaluated criteria of the PCHE-III instrument for measuring the psychosocial dimension of the study. Fleiss' Kappa yielded an overall value of 0.81, indicating very good agreement; specifically, values of 0.81 were obtained for the clarity, coherence, and relevance criteria of the instrument, while for sufficiency the value was 0.64. Aiken's V coefficient reported a value of 1 for all four criteria, supporting the validity of the instrument in measuring the psychosocial dimension of Nursing Care (Roa, 2022). These findings consolidate the validity of the PCHE-III for the evaluated criteria.

On the other hand, Melita, Jara, Pereira, and Luengo (2018) assessed the convergent validity of the PCHE-III using a correlational method, comparing it with a test measuring similar aspects: the "Scale for Evaluating the Perception of Humanized Care Provided by Nursing Professionals" (ECH) by Hermosilla, Mendoza, and Contreras (2016, cited by Melita et al., 2018), validated in the Chilean population and composed of 36 items. Both instruments were simultaneously administered to the same group of patients, and Spearman's correlation coefficient was used with a significance level of 5%.

For construct validity, the normality of the instruments was analyzed using the Shapiro-Wilk test, obtaining p-values of 0.040 and 0.056 for the cross-culturally adapted Chilean version of the PCHE-III and the ECH, respectively, leading to the use of Spearman's Rho test (Melita, Jara, Pereira, & Luengo, 2018). The results showed a positive correlation of 0.73 between both instruments, confirming their convergence. Additionally, when correlating the dimensions of the PCHE-III with the total score of the ECH, a high positive correlation was evidenced, supporting the construct validity and convergent validity of the PCHE-III in its Chilean version (Melita, Jara, Pereira, & Luengo, 2018). These findings constitute a significant contribution, as the instrument's convergent validity had not been evaluated in prior studies.

In the exploratory factor analysis (EFA) of González's (2015) study, a KMO index of 0.956 and a significant Bartlett's sphericity test (*p* < .001) were obtained, allowing the calculation of factor loadings and the theoretical definition of three dimensions with 55.5% explained variance. In the present study the EFA results reinforce this factorial structure, with a KMO index of 0.980, indicating excellent sample adequacy, and an equally significant Bartlett's test. Varimax rotation optimized the interpretation of the factors by redistributing factor loadings, facilitating the identification of three dimensions in the instrument.

Similarly, the scree plot showed a marked decrease in explained variance after the third factor, validating the selection of the number of factors. In terms of total variance explained, the three factors reached 73.9%, with the highest concentration in the first (62.9%), while the second and third contributed to a lesser extent (6.09% and 4.8%, respectively). These results demonstrate that the factorial structure of the PCHE-III is stable and supports its construct validity, consolidating its ability to evaluate the perception of Humanized Care in nursing.

However, when comparing the items comprising the factor loadings in this study with those in the EFA conducted by González (2015), differences in their composition are observed, indicating variability in the distribution of factor loadings. This variation could be attributed to the larger sample size of the present study, which influenced the distribution of factor loadings.

On the other hand, studies in dentistry that applied psychometric measurements to PCHE-III in its version adapted to this discipline were reviewed. Although the number of items remained the same as in the nursing PCHE-III, specific linguistic adjustments were made for the dental context, preserving the original three dimensions of the instrument. This adaptation was developed by González et al. (2020), with the participation of the PCHE-III authors. In this study, the instrument adaptation was validated through expert judgment involving a psychologist, a general dentist, a surgeon, an endodontist, and a periodontist. The experts assessed the sufficiency of the items with an average rating of 4.0 and established a minimum validity ratio of 0.70. Additionally, adequate indices were obtained for clarity (0.70), coherence (0.71), and relevance (0.75), confirming the feasibility of the instrument for application in dentistry (González et al., 2020).

Furthermore, López and Gómez (2019) conducted a psychometric study of the PCHE-III in dentistry with 259 patients, performing validity and reliability analyses. In their validation, they eliminated three items for being deemed irrelevant in the dental context. Subsequently, through exploratory factor analysis, they identified three factors explaining 45.7% of the variance and adjusted the instrument to 28 items. Reliability was confirmed with a Cronbach's alpha of 0.892 (López & Gómez, 2019).

Additionally, the study by Pérez-Ospina et al. (2023) evaluated the validity and reliability of the instrument Perception of Humanized Care Behaviors in Health (PCHE-III Dentistry Version) using CTT and the Rasch model from IRT. Their objectives included analyzing the instrument's validity, item fit, and Differential Item Functioning (DIF) according to sociodemographic and clinical variables. The research, designed as a diagnostic technology evaluation, was conducted in 2022 with 654 patients from the Comprehensive Adult Clinics of the Universidad Santo Tomás (Floridablanca Campus).

Key results include an internal consistency of 0.95 (Cronbach's Alpha) for the instrument. The three dimensions obtained values between 0.82 and 0.91, indicating high reliability. Thirty of the 32 items fit the Rasch model, while items 18 and 31 did not meet the fit criteria (MNSQ index outside the 0.6–1.4 range). Furthermore, items 2 and 16 showed Differential Item Functioning (DIF) based on the presence of a systemic condition. After removing these four items, the instrument was reevaluated, showing improved item separation

and a more adequate distribution in the Wright person-item map, which represents person and item performance in logits (Bond & Fox, 2015, cited by Pérez-Ospina et al., 2023).

The results indicated that the easiest item to answer was item 1, consistent with the findings of the present research, while the three most difficult were items 12, 19, and 25. This confirms the results regarding the difficulty of item 12; however, no coincidence was found with the other items in Pérez-Ospina et al.'s (2023) study. In conclusion, López and Gómez's (2019) study confirmed the validity and reliability of the PCHE-III Dentistry Version using Classical Test Theory (CTT). Pérez-Ospina et al. (2023) used both CTT and Item Response Theory (IRT), further consolidating the instrument's suitability for evaluating the perception of humanized care in this field.

It is worth noting that Pérez-Ospina et al.'s (2023) study was the only one identified in the literature that applied an IRT-based psychometric analysis to the PCHE-III, albeit in its dentistry version. In this sense, the findings of the present research are innovative, as they constitute the first evaluation of the PCHE-III in the nursing context using IRT, thereby expanding knowledge about its psychometric properties for this discipline.

Conclusions

The psychometric evaluation of the PCHE-III instrument confirms its robustness and consistency for measuring Humanized Care, integrating Classical Test Theory (CTT), and Item Response Theory (IRT) approaches. From CTT, Cronbach's Alpha (0.979) and McDonald's Omega (0.981) indicate excellent reliability, suggesting the instrument has high internal consistency. However, since this approach does not allow for analyzing individual item performance, it was complemented with IRT analysis using the Two-Parameter Logistic Model (2PL) and the Partial Credit Model (PCM), obtaining a reliability of 0.835, suggesting adequate precision in evaluating the latent variable. Additionally, the negative values on the logit scale reflect that the items have low difficulty, indicating the instrument is accessible and does not represent a high cognitive burden for participants.

The item fit analysis of the PCHE-III instrument from IRT identified that most items fall within the expected range, supporting their validity. However, item IN12 showed significant misfit, with high infit (4.148) and outfit (5.040) values, suggesting atypical behavior and possible measurement of a different construct. A review of its Item Characteristic Curve (ICC) confirmed this trend, revealing irregularities in its shape and low discriminative capacity.

Results from the Exploratory Factor Analysis (EFA) indicate that the PCHE-III instrument has a clear and well-defined three-factor structure, suggesting Humanized Care can be explained through these dimensions. The total variance explained by these factors (73.9%) is significant, with the highest concentration of information in the first factor (62.9%), while the second and third contribute less (6.09% and 4.8%, respectively). This demonstrates that the instrument's factorial structure is stable and allows for adequate construct validity of the PCHE-III, i.e., its ability to accurately evaluate the perception of humanized nursing care.

Finally, the convergence between the PCM and 2PL models strengthens the validity of the findings, as they allow the instrument to be analyzed from different perspectives. While the PCM offers a detailed view of the progression between response categories, the 2PL facilitates the identification of items with atypical behavior, contributing to test optimization. In this sense, the psychometric analysis confirms that the PCHE-III performs adequately within Item Response Theory; however, some items must be reformulated to improve their alignment with the evaluated construct.

Recommendations for Research

Based on the results of this study, it is recommended to adjust the PCHE-III instrument items that presented comprehension difficulties for participants, as well as incorporate changes

to the dimensional structure identified. This will enable the development of a revised version of the instrument with the adjustments identified in this research.

It is recommended to promote good ethical practices in research, ensuring that measurement instruments are used with due authorization from their authors. In this regard, for the use of the PCHE-III, it is essential to request permission from Rivera and Triana (2023), thereby guaranteeing respect for copyright and the correct application of the instrument in future studies.

Recommendations for Teaching

It is essential to continue strengthening teaching-learning processes in the training of health professionals, promoting care centered on patient dignity and well-being. This requires training health personnel to integrate scientific knowledge, ethical principles, sociocultural values, and socioemotional competencies within a pedagogy based on care. This approach should enable dialogical, critical, and emancipatory training, free of violence and committed to humanized care.

Similarly, it is suggested to continue strengthening teaching-learning processes in advanced psychometric models, as Item Response Theory (IRT), to enhance the capacity of psychology professionals in evaluating health measurement instruments.

Recommendations for Practice:

It is recommended to establish specific indicators to evaluate and strengthen the implementation of humanized care practices in health institutions. The PCHE-III instrument offers items that can be transformed into key indicators to monitor the quality of humanized care, ensuring effective implementation. Additionally, organizations can develop additional metrics to measure how their policies, structure, and institutional culture contribute to creating spaces conducive to the humanization of care, thereby promoting patient-centered care focused on dignity and well-being.

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