Artículo de Investigación

Nursing Warmth Scale (NWS): Development and empirical validation*

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Abstract

Objetive: To construct and validate the Nursing Warmth Scale (NWS) through the development of a standardized measurement of nurses' warmth, perceived from the perspective of patients, and identify the behaviors and factors associated with this feeling of warmth.

Materials and methods: The NWS was developed following the scale construction methodology under a triphasic model. The construction of items was elaborated based on the results of a previously published integrative review that consolidated the construct and the related variables. A qualitative phase was also incorporated to evaluate the latent variable. Content validity was assessed with 10 expert judges. An item try-out was conducted with 476 patients in health institutions. Exploratory factor analysis —through the common factor method and oblique rotation— was used for the item reduction process.

Results: The construct "Nursing Warmth" was established after the theoretical and empirical phases of the study. The literature review and interviews with 23 patients and 25 nursing professionals provided a set of behaviors divided into 2 categories: verbal and nonverbal behaviors. Exploratory factor analysis allowed identifying 5 factors and 35 items. The reliability was estimated through Cronbach's alpha. The identified factors are: F1-Nonverbal connection-relationship with the other (0.943), F2-Empathy (0.909), F3-Verbal connection-relationship with the other (0.914), F4-Inclusion (0.858), and F5-Confidence (0.852). The Tucker-Lewis Index was 0.901.

Conclusions: The NWS demonstrates evidence of reliability and validity. This tool may be useful in clinical settings and for teaching and research addressing interpersonal nursing skills.

Descritores: Nursing Care; Nurse-Patient Relations; Empathy; Trust; Psychometrics (fuente: DeCS, BIREME).

* This project was developed as the subject of Zita Lagos Sánchez's doctoral thesis, which addressed the construction and validation of a scale of warmth behaviors in nursing.

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Escala de Calidez en Enfermería (ECAE): construcción y validación empírica

Resumen

Objetivo: construir y validar la Escala de Calidez de Enfermería (ECAE) mediante el desarrollo de una medida estandarizada de la calidez de la enfermería desde la perspectiva de los pacientes, además de identificar los comportamientos y factores asociados con la calidez.

Materiales y métodos: la ECAE fue desarrollada según la metodología de construcción de escalas y empleando un modelo trifásico. La construcción de ítems se elaboró con los resultados de una revisión integrativa previamente publicada, que consolidó el constructo y las variables relacionadas. Se incorporó además una fase cualitativa con el fin de evaluar la variable latente. La validez de contenido fue testeada con 10 jueces expertos. Se realizó la validación de los ítems con 476 pacientes de instituciones de salud. Para el proceso de reducción de ítems se utilizó el análisis factorial exploratorio, mediante el método de factores comunes y rotación oblicua.

Resultados: luego de las fases teórica y empírica del estudio, se estableció el constructo "Calidez en Enfermería". La revisión de la literatura y las entrevistas a 23 pacientes y 25 profesionales en enfermería proporcionaron un conjunto de comportamientos divididos en dos categorías: conductas verbales y conductas no verbales. El análisis factorial exploratorio identificó 5 factores y 35 ítems. La confiabilidad se estimó con Alfa de Cronbach. Los factores identificados son: F1-Conexión no verbal (0,943), F2-Empatía (0,909), F3-Conexión verbal (0,914), F4-Inclusión (0,858) y F5-Confianza (0,852). El índice de Tucker-Lewis fue de 0,901.

Conclusiones: la ECAE demuestra evidencias de confiabilidad y validez. Esta herramienta puede ser útil en el ámbito clínico y en la enseñanza e investigación de habilidades interpersonales en Enfermería.

Descritores: Atención de Enfermería; Relaciones Enfermero-Paciente; Empatía; Confianza; Psicometría (fuente: DeCS, BIREME).

Escala de Calor Humano em Enfermagem (ECHE): construção e validação empírica

Resumo

Objetivo: construir e validar a Escala de Calor Humano em Enfermagem (ECHE) mediante o desenvolvimento de uma medida padronizada do calor humano da enfermagem sob a perspectiva dos pacientes, além de identificar os comportamentos e fatores associados com o calor humano.

Materiais e métodos: a ECHE foi desenvolvida de acordo com a metodologia de construção de escalas e utilizando um modelo trifásico. A construção dos itens foi elaborada com os resultados de uma revisão integrativa publicada previamente, que consolidou o construto e as variáveis relacionados. Uma fase qualitativa também foi incorporada para avaliar a variável latente. A validade do conteúdo foi testada com 10 juízes especialistas. Os itens foram validados com 476 pacientes de instituições de saúde. Para o processo de redução de itens, foi utilizada a análise fatorial exploratória por meio do método fatorial comum e da rotação oblíqua.

Resultados: após as fases teórica e empírica do estudo, foi estabelecido o construto "calor humano em enfermagem". A revisão da literatura e as entrevistas com 23 pacientes e 25 profissionais de enfermagem forneceram um conjunto de comportamentos divididos em duas categorias: comportamentos verbais e não verbais. A análise fatorial exploratória identificou cinco fatores e 35 itens. A confiabilidade foi estimada com o alfa de Cronbach. Os fatores identificados são F1-Conexão não verbal (0,943), F2-Empatia (0,909), F3-Conexão verbal (0,914), F4-Inclusão (0,858) e F5-Confiança (0,852). O índice de Tucker-Lewis foi de 0,901.

Conclusões: a ECHE demonstra evidência de confiabilidade e validade. Essa ferramenta pode ser útil no cenário clínico e no ensino e pesquisa de habilidades interpessoais em Enfermagem.

Descritores: Cuidados de Enfermagem; Relações Enfermeiro-Paciente; Empatia; Confiança; Psicometria (fonte: DeCS, BIREME).

Introduction

In nursing, interpersonal skills may be predictors of satisfaction since they are a relevant component of nurses' skills (1). Soft skills in nursing care are important attributes that may be even more relevant than care, the technical component of user satisfaction (2). Warmth is an important attribute in health care that is also a relevant factor and a decoder of patients' communication (3). However, this attribute has been little explored in health and nursing care. Warmth holds an incredibly special place in life because it works throughout the entire spectrum of human experience. A positive family context, characterized by warm relationships promotes the positive development of children towards adolescence (4). Warmth also helps us be healthy human beings on many distinct levels (5).

Warm behaviors have strong impacts on the measurement of users' satisfaction (6). For patients, kindness, smiles, affection, and tenderness have greater relevance than the technical component of care (7). As an example, respect, supportiveness, communication, and faithfulness are among the most frequently identified personality traits of "good nurses" (2).

A nurse's warmth and professional competences are fundamental aspects perceived by the patient with a compensatory association between them. Both dimensions are essential in social judgment and show that the appreciation in either of them influences the way a person judges another (8). Therefore, warmth and competence predict an increase in helping intentions (9).

When studying warmth measurement in the nursing practice, no instruments were found. Despite the relevance of this important dimension, there is not enough evidence to highlight this value in nursing care nor a consistent way for its measurement.

With the above in mind, the objective of this study was to construct and validate the Nursing Warmth Scale (NWS) through the development of a standardized measurement of nursing professionals' warmth, from the perspective of patients, and identify the behaviors and factors associated with this concept.

Materials and methods

This is a methodological and psychometric study on the construction of a psychosocial construct measurement scale using the psychometric reference.

A study was conducted to build and validate the NWS (10). The psychosocial construct was formulated using the psychometric test reference (11) developed in three phases: theoretical, empirical, and analytical (12). A theoretical review and interviews with patients and professionals were included, as well as an assessment with a panel of 10 judges (13).

The conducted procedures included an integrative review, following the recommendations for this type of studies (14) included in works previously published by the authors (15). Additionally, interviews with patients and nurses were performed with the aim of broadening the understanding of concepts and behaviors around the feeling of warmth.

The authors developed the construction of items, during a first phase, with the results of an integrative review that consolidated the construct "Nursing-warmth" and a set of variables related to this concept (15), and with the information provided by the qualitative study developed to evaluate the latent variable and increase the pool of items. The construct of warmth is then understood as "The ability to establish and maintain a close host relationship that demonstrates tenderness, trust, the affection, and love, through both verbal and nonverbal behaviors, in such a way that it means a pleasant experience for the other person" (15, p. 106). After the formulation of the construct, warmth-related behaviors were identified and then grouped into 2 major categories: 70 verbal and 23 non-verbal behaviors.

At this stage, interviews were conducted with patients and nurses from medical units at a public hospital and private clinic, inquiring about behaviors mentally associated with warmth. Twenty-three patients with 3 days of hospitalization and 25 nurses were interviewed. The results about related behaviors derived from the analysis of the interviews (16) were incorporated into those derived from the theoretical phase, resulting in a total of 154 items.

The criteria used for reducing items from the scale was to remove those that appeared more than once. In cases where items had both negative and affirmative statements, the affirmative item was chosen. As a result, the number of items was reduced from 154 to 136.

Content validation was performed with the help of 10 expert judges, following the approaches by Mary Lynn and other authors (17). The panel was selected based on inclusion criteria, which considered experts' educational background and experience in different disciplines. Finally, six nurses, two psychologists, a civil engineer, and a social worker were selected, all of them with expertise in user satisfaction.

The group of experts performed the semantic, grammatical, and syntactic equivalence analysis of items and provided recommendations for a better understanding of these elements (17). Items were evaluated using an instrument designed for this phase of the process, which assessed their relevance, pertinence, clarity, and essentiality.

The scores assigned to each category were determined, ensuring the representation of the definitions and semantics in Spanish for each extreme of the scale. The criteria no warmth to absolute warmth was used.

The harmonization of items and standardization of the instrument was conducted in a pre-testing phase, which included a pilot test with a sample of 25 patients to check item comprehension and compliance and to collect suggestions. Only patients with 3 days or more of hospitalization were included in the sample.

Sample

Following content validation, the internal structure of the scale was tested in a sample of 476 individuals. To obtain the sociodemographic data of participants, a section that gathered information on gender, age, diagnosis, days, and hospitalization unit was incorporated at the beginning of the instrument. The sample size was calculated according to the number of items in the scale and the statistical methods employed (18). Therefore, the ratio of the number of items and the expected sample size should range from 1:5 to 1:10, with an initial sample of at least 150 individuals (19). To ensure heterogeneity, convenience sampling was used for selecting the participants of the research, who were patients hospitalized in the units of medicine and surgery in a public hospital and two private clinics. The inclusion criteria mentioned above was also considered during the sampling and the selected individuals were personally contacted for data collection. After an induction process, the instrument was self-administered, granting participants the possibility of answering questions at the time of the scale removal, respecting their legal rights and duties.

Statistical procedures

The objective of this analysis was to evaluate the validation of the internal structure of the NWS. Thus, exploratory factor analysis (EFA) was performed in order to analyze the validity and accuracy of the battery of 136 items. The explanatory ability of the factors was also analyzed, examining the proportion of the variance explained by each of them. Finally, the reliability of the preliminary scale was estimated. Initially, the matrix of variables was built for 476 subjects and 136 items, and the data were grouped and coded. Totals, averages, standard deviation, and inferential statistics were used for quantitative data, while qualitative information was grouped and categorized by absolute and percentage frequencies.

The number of factors was determined using the common factor and rotation matrix methods. In the case of factor number determination, factorial loading, the Guttman-Kaiser criterion, or self-worth (20), the root mean square error of approximation (RMSEA), the Tucker-Lewis index (TLI) (21), and the fit incremental goodness index were used. The RMSEA measures the distance between two correlation matrices estimated by the factors. Finally, consistency was measured through Cronbach's alpha (22).

Statistical analysis

Statistical analysis involved EFA. For the removal of redundant items that shared the same variance, we applied a corrected homogeneity index with item-total correlation and without the scanned items (23). Cronbach's alpha was affected when removed items were analyzed, choosing the item with the best factor load or that that was qualitatively more important. Keeping at least 3-4 items by factor was ensured (24). Finally, we conducted a parallel analysis and carried out the rotation of factors (Oblimin) (25).

The graphic verification of factors was determined using the Scree-Test (eigenvalue). The self-worth value indicates the total amount of variance that explains each factor for grouped variables, thus determining the number of factors to be retained. In Likert-type scales, greater than 5 points with polytonic items, the use of the product-moment correlation matrix is recommended (26).

The analysis of the cumulative explained variance, necessary to interpret the proportions that justified each factor, plus that of the variance for the whole matrix of the final solution was performed using the "R" program (The R-Project for Statistical Computing, v3.1.3). To obtain the best solution for an appropriate model, the resulting items within each factor were analyzed qualitatively. Items describing similar behavior were compared with through RMSEA, choosing those who were the least harmful by internal consistency.

The study was approved by the Scientific Ethics Committee of the Universidad de los Andes (Chile) and the ethics committees of the respective institutions of the health and regional government (Concept Consubstantiated of Committee for Ethics in Research. August 26, 2014. CAAE: 34554514.6.0000.5392. Concept number: 772.008).

Results

Sample characterization

As shown in Table 1, the sample was comprised of approximately the same share of women and men (48 and 51%, respectively). Among participants, 75% belonged to the private health system and 18% to the public system. The average age was 47.3.

As for their educational level, 60% of the participants reported a high level of education. Besides, 83% claimed to live with their family or accompanied and 70% were hospitalized by a medical or surgical diagnosis, with an average of 5,7 days of hospitalization. On average, 80% of the patients had previously been hospitalized three times.

Analysis of load factor

The load factor matrix presented in Table 2 was the ultimate solution after the analysis of the 4 adjustments performed to the model. The path-diagram charts, in a more understandable way, the relationships between variables and the ordered loads and hypothetical relationships for each factor; for example, Factor-5 in the original diagram corresponds to Factor-3 in the final solution (Figure 1). Similarly, the self-value graph criterion clearly shows 5 factors, as depicted in Figure 2.

Factor analysis results show that warmth, according to this validation sample, is composed of 5 factors. The synthesis of the extracted factors is shown in Table 3.

Each factor showed results of high internal consistency, measured through Cronbach's alpha statistical (F1: 0.94; F2: 0.90; F3: 0.91; F4: 0.85; F5: 0.85). The load factor of the 35 items exceeds 0.55 points. The literature recommends that studies with samples exceeding 350 subjects select the items with loads over 0.30 (26). Five factors explained 61.6% of the variance, being 20% explained by Factor-1. Items with a lower RMSEA index were chosen to be removed (Table 4). The definitive solution was set at 5 factors and 35 items. Finally, the TLI improved from 0.880 to 0.901.

Table 1. Sample description: socio-demographic characteristics and hospital internment

Variables	No.	%
Gender		
Female	231	48
Male	242	51
No response	3	1
Age range		
18-40	183	38
41-64	195	41
65-80	76	16
81-98	22	5
Average (standard deviation)	47.3	(17.1)
Educational level		
No formal education	2	0
Primary school	22	5
Secondary school	70	15
Post-secondary education, university degree, vocational degree or currently studying	285	60
No response	97	20
Health insurance		
ISAPRE (private system)	359	75
FONASA (public system)	86	18
Institutional, private, no-health insurance	10	2
No response	21	5
Health care institution		
Private: C. Santa María	405	85
Private: C. UANDES	29	6
Public: H. Santiago Oriente	42	9
Medical diagnosis during hospital stay		
Medical	164	35
Surgical, trauma-orthopedics or plastic surgery	172	36
Oncological	33	7
OB-GYN	25	5
Medical procedures	18	4
Does not know/does not respond	64	13
Private institution mode (%)	Medical	(32)
Public institution mode (%)	Medical	(55)
Days of hospitalization		
3	219	46
4-7	138	29
8-20	31	7
21-180	15	3
No response	73	15
Average (standard deviation)	5.7	(13.0)

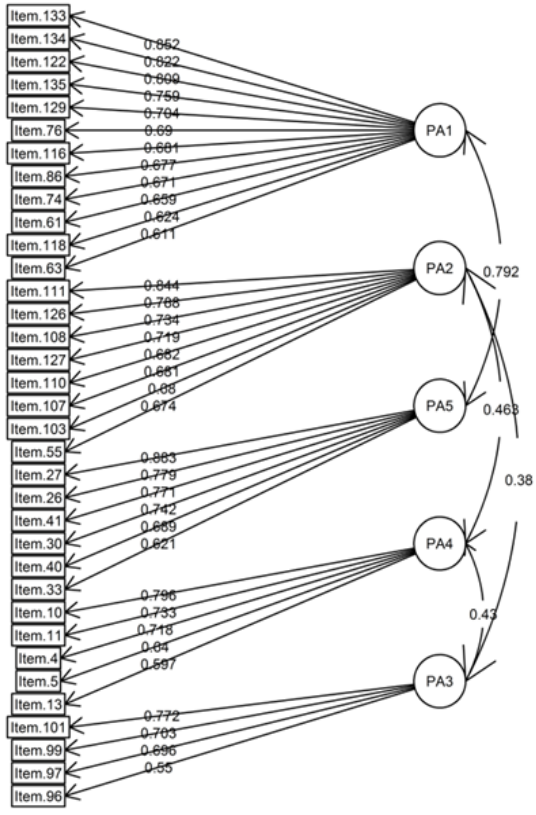
Source: authors.

Table 2. Factor loadings matrix with the final items

Item	Factor loadings				
	Factor-1	Factor-2	Factor-3	Factor-4	Factor-5
133. Se mantiene de brazos cruzados.	0.852	0.138	-0.042	0.031	-0.076
134. Muestra expresión facial de indiferencia.	0.822	0.022	0.078	0014	-0.008
122. Mueve con impaciencia el cuerpo cuando está oyendo.	0.809	0.066	-0.042	-0.104	0.045
135. Mantiene una posición corporal de quien está saliendo o yendo.	0.759	-0.058	-0.022	-0.012	0.156
129. Evita tocar al paciente.	0.704	-0.005	-0.046	-0.036	0.044
76. Usa frases de tono burlesco, irónico o sarcástico.	0.69	0.002	0.146	0.062	-0.124
116. No sonríe.	0.681	-0.02	0.126	0.011	0.039
86. Se hace el leso(a).	0.677	-0.049	0.138	0.062	-0.078
74. Contagia con su frialdad.	0.671	-0.076	0.15	0.079	-0.068
61. Es irritable, demuestra mal humor.	0.659	-0.062	0.198	0.011	-0.006
118. Mira a la persona, mas no a los ojos.	0.624	0.028	-0.008	0.07	0.067
63. Impresiona que hace preguntas solo por obligación o protocolo.	0.611	-0.069	0.138	-0.061	0.127
111. Parece que sufre conmigo.	0.109	0.844	-0.035	-0.031	-0.048
126. Abraza en situaciones que ameriten.	-0.091	0.788	0.089	0.018	-0.027
108. Le trata como si fuese un familiar o persona conocida.	0.081	0.734	-0.07	0.065	0.088
127. Toma las manos en situaciones que lo ameriten.	-0.148	0.719	0.074	0.053	0.043
110. Se involucra y comprende como si fuese la otra persona.	0.064	0.682	-0.086	-0.004	0.244
107. Comprende y "vivencia" con el otro y comparte sentimientos.	-0.045	0.681	0.046	0.087	0.166
103. Demuestra sus sentimientos.	-0.007	0.68	0.012	0.069	0.106
55. En ocasiones especiales da pequeños regalos.	0.113	0.674	-0.025	0.078	-0.2
27. Es impaciente y expresa apuro o incomodidad.	-0.036	0.01	0.883	-0.038	0.03
26. Es agresivo(a), usa malas palabras.	0.061	0.019	0.779	-0.09	0.038
41. Discrimina al paciente y familia.	0.088	-0.035	0.771	0.025	-0.042
30. Habla en tono fuerte, golpeado, autoritario.	0.072	0.034	0.742	0.035	-0.026
40. Censura a paciente y familia por sus hábitos, opiniones y comportamientos.	0.161	-0.014	0.689	-0.035	0.056
33. No da continuidad a las respuestas y soluciones a los problemas.	0.091	0.012	0.621	0.078	-0.014
10. Explica cuál es el rol del enfermero que estará a cargo del cuidado y cómo lo ayudará.	0.101	-0.021	-0.074	0.796	0.058
11. Da orientaciones necesarias sobre eventos o rutinas importantes.	0.095	-0.03	-0.086	0.733	0.11
4. Se presenta con el nombre y cargo.	-0.108	0.027	0.13	0.718	0.072
5. Pregunta por su nombre (o cómo quiere que lo nombren), antes de la atención.	-0.094	0.266	-0.008	0.64	-0.11
13. Hace sugerencias oportunas a usted, familiares o acompañantes para adaptar hábitos a las rutinas de la institución.	0.001	0.165	-0.051	0.597	0
101. Impresiona honesto(a) en lo que dice.	0.052	0.165	-0.021	-0.023	0.772
99. Impresiona que no se va a equivocar.	0.074	0.075	0.002	0.028	0.703
97. Se nota que domina su área de conocimiento.	-0.037	-0.108	0.055	0.306	0.696
96. Impresiona que las personas creen en su palabra.	-0.079	0.253	0.146	0.072	0.55
Total	**35 items**				

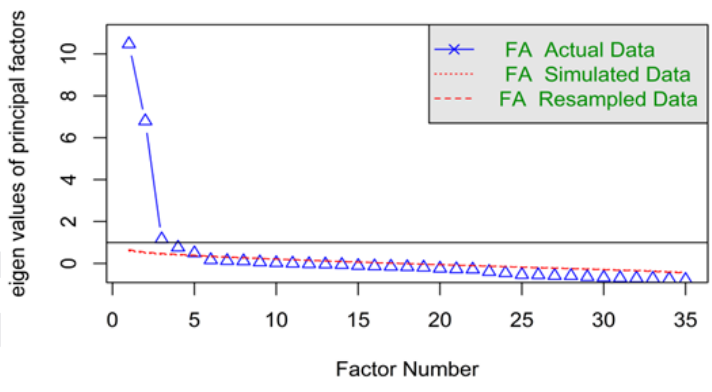
Analysis of load factor. Items are expressed in their original language.
Source: authors.

Figure 1. Path-diagram: relationship between variables in the Nursing Warmth Scale



Source: authors, using R software.

Figure 2. Self-values in the final solution after parallel analysis



Source: authors, using R software.

Table 3. Extraction of factors and results in the Nursing Warmth Scale

Factor	No. of items	Cronbach's alpha	Factor loadings range
Factor-1 (F1): Connection-Nonverbal relationship	12	0.943	0.852-0.611
Factor-2 (F2): Empathy	8	0.909	0.844-0.674
Factor-3 (F3): Connection-Verbal relationship	6	0.914	0.883-0.621
Factor-4 (F4): Inclusion	5	0.858	0.796-0.597
Factor-5(F5): Confidence	4	0.852	0.772-0.55
Total	**35 items**	0.93	0.852-0.55

Source: authors.

Table 4. Comparison of Cronbach's alpha score after analysis with the composition of 35 and 45

Cronbach's alpha	Before removing items	After removing items
F1	0.956	0.943
F2	0.934	0.909
F3	0.914	0.914
F4	0.990	0.858
F5	0.877	0.852
Total	**45 items**	**35 items**

Source: authors.

Magnitude of warmth

Patients were asked to consider the magnitude of warmth using the words nothing/little/intermediate/much/extreme by means of an adapted 7-point Likert scale. The final composition of the scale is described in Table 5.

Table 5. Definite composition of the items in the Nursing Warmth Scale

Construct	Factor	Items	No-warmth	Little-warmth	Intermediate-warmth	Much-warmth	Extreme-warmth
W A R M T H	F1 –Nonverbal connection and relation with others	Item 1 – Se mantiene de brazos cruzados.					
		Item 2 – Muestra expresión facial de indiferencia.					
		Item 3 – Mueve con impaciencia el cuerpo cuando está oyendo.					
		Item 4 – Mantiene una posición corporal de quien está saliendo o yendo.					
		Item 5 – Evita tocar al paciente.					
		Item 6 – Usa frases de tono burlesco, irónico o sarcástico.					
		Item 7 – No sonríe.					
		Item 8 – Se hace el “leso” (a).					
		Item 9 – Contagia con su frialdad.					
		Item 10 – Es irritable, demuestra mal humor.					
		Item 11. – Mira a la persona, mas no a los ojos.					
		Item 12 – Impresiona que hace preguntas solo por obligación o protocolo, no demostrando interés genuino.					
	F3 – Verbal connection and relation with others	Item 21 – Es impaciente y expresa apuro o incomodidad.					
		Item 22 – Es agresivo, usa “malas” palabras.					
		Item 23 – Discrimina a paciente y familia.					
		Item 24 – Habla en tono fuerte, golpeado, autoritario.					
		Item 25 – Censura a paciente y familia por sus hábitos, opiniones y comportamientos.					
		Item 26 – No da continuidad a las respuestas y soluciones a los problemas.					

Construct	Factor	Items	No-warmth	Little-warmth	Intermediate-warmth	Much-warmth	Extreme-warmth
	F2 – Empathy	Item 13 – Parece que sufre conmigo.					
		Item 14 – Abraza en situaciones que ameriten.					
		Item 15 – Le trata como si fuese un familiar o persona conocida.					
		Item 16 – Toma las manos en situaciones que lo ameriten.					
		Item 17 – Se involucra y comprende como si fuese la otra persona.					
		Item 18 – Comprende y "vivencia" con el otro y comparte sentimientos.					
		Item 19 – Demuestra sus sentimientos.					
		Item 20 – En ocasiones especiales da pequeños "regalos".					
	F4 – Inclusion	Item 27 – Explica cuál es el rol del enfermero (a), que estará a cargo del cuidado y como lo ayudará.					
		Item 28 – Da orientaciones necesarias sobre eventos o rutinas importantes.					
		Item 29 – Se presenta con el nombre y su cargo.					
		Item 30 – Pregunta por su nombre (o como quiere que lo nombren), antes de la atención.					
		Item 31 – Hace sugerencias oportunas, a usted, familiares o acompañantes, para adaptar sus hábitos a la rutina de la institución.					
	F5 – Confidence	Item 32 – Impresiona honesto(a) en lo que dice.					
		Item 33 – Impresiona que no se va a equivocar.					
		Item 34 – Se nota que domina su área de conocimientos.					
		Item 35 – Impresiona que las personas creen en su palabra.					
Total		**35 items**					

Protocol for score calculation: The NWS will allow obtaining a score for each factor adding up for a total of 140-points.
Source: authors.

Discussion

The objectives of building and validating the NWS from the perspective of patients and identifying behaviors associated with warmth were fully achieved. In doing so, this study fills an existing gap regarding the meaning of warmth in nursing, since this feeling brings together interpersonal nursing skills that strongly affect patients' perceptions regarding the care experience (1, 2). Interpersonal skills have immense value in building bonds with the patient, with warmth or a human tone, being a desirable attribute of nurses in providing humane and safe care (27).

The "nurse warmth" construct and the items that comprise it were initially generated from a literature review, achieving a methodological integration of the concept and its dimensions. The attributes of nurse warmth that have been defined in the current literature, such as closeness, expression of affection, effective communication, respect, and the nurse-patient bond (28), go in line with our proposal, since we address connection, empathy, inclusion, and confidence, all of which contribute to strengthening the relationship and bonds between nurses and their patients.

The review by the group of experts allowed validating the content of the scale, thus adjusting the degree to which the analyzed items represent the warmth construct and categorizing verbal and non-verbal behaviors with a relevant meaning in the dynamic and fluid communication with the patient, which is crucial to generate a reliable relationship in the care process (29).

After the analysis by experts, the qualitative phase, and the internal structure analysis, we generated the NWS with 35 items reduced into 5 factors, with factorial loads that exceed 0.55 and represent 61% of the total variance (10).

The NWS reflects warm behaviors associated with the caregiving praxis, which has in turn a humanizing nature when providing nursing care with warmth (30). The presence of warm behaviors in the care provided by nurses not only contributes dynamically to bond formation, but also has positive results in the treatment of patients and can contribute to 85% of the therapeutic effect (31).

Factor-1 (Nonverbal-Connection) has items with a high factorial load that mostly describe the absence of warmth, such as *Does not smile* or *looks at the person, but not into the eyes*, so that non-verbal communication that favors relational bonds, such as smiling and eye contact (32), is more relevant in their absence, possibly because it is expected. The exchange of messages must contain codes that could be understood and culturally accepted, being the non-verbal component an effective tool to establish contact with patients.

Factor-2 (Empathy) includes items related to the definition of empathy in nursing: "The ability to understand the experiences, concerns and perspectives of another person, added to the ability to communicate this understanding" (33, p. 121). For example, item 13 (*It seems that he suffers with me*) and item 17 (*He gets involved and understands as if he/she were the other person*) denote the nurse's ability to perceive and understand the patient from the emotional dimensions of empathy (33).

The literature confirms that when nursing care goes beyond the biological, empathy becomes a basic need. However, nurses are empathic in contexts that encourage such occurrence, demonstrating that empathy grows with constant reinforcement (34). In this way, the NWS contributes to the identification, understanding and establishment of warm behaviors that represent empathy, thus being able to develop a kind of training that favors the understanding, establishment, and permanence of these care behaviors in health institutions.

Factor-3 (Verbal-Connection) includes items that are related to the importance of verbal communication, including words and voice tone, i.e., item 24 (*Speaks in a loud tone, authoritarian*), which has a relevant meaning on the message, especially in the conception of the social-voice that incorporates the receiver's interpretation of the acoustic properties of the voice, powerful cues when forming social impressions (35).

For the person receiving care, verbalization reduces tension and anxiety, helps in coping with the experience of the disease, and generates a form of trust, thus verbalizing this feeling will contribute to the healing process. For the nurse, verbalization enables to identify the needs of the sick person. (29). Overall, identifying the warm behaviors grouped in this factor contributes to the understanding of the person.

Factor-4 (Inclusion) incorporates behaviors related to induction to the healthcare environment, which implies informing patients about who nurses are and what they do, giving relevance to the first contact that generates a more human therapeutic relationship. In Chile, these aspects are legally regulated, stating that patients have the right to receive understandable information and be treated with kindness (36). The empathic relationship also contributes to the approach and inclusion of the patient within the health area (31).

Finally, Factor-5 (Confidence) reasserts the models of warmth and competence impressions (8). Confidence is the basis of social practices and is intricately linked to professional competence (8).

Knowing warmth-related behaviors associated with trust will allow nurses to show how competent they are in their area without neglecting the warm components of the relationship, strengthening the balance between warmth and competence.

Since warmth influences patient satisfaction (6), establishing a level for this construct in order to satisfy the user can be especially useful. Identifying the factors associated with nursing warmth will allow for improved care management, research, and education. However, some cultural aspects must also be considered, since unaccepted behaviors related to personal contact vary among cultures. Therefore, a cross-cultural adaptation is required to be applied in other linguistic contexts (37).

In this study, it was not possible to achieve 10 subjects per variable, as expected (18). However, an arrangement with high factor loadings was obtained with indices and excellent reliability. To conclude, other methodological contributions should be incorporated in the future, such as the item-response theory.

Conclusions

The NWS is the first scale that measures warmth in the nursing discipline. This tool shows evidence of validity and reliability for the Chilean population and provides the discipline with a new instrument that addresses a relevant dimension for nursing.

Our study provides a scale that incorporates a qualitative phase in its development that involved the contributions of professionals and users for the construction of items, represented in behaviors, which were validated by experts according to the recommendations regarding content validation.

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