



Aquichan

ISSN: 1657-5997

ISSN: 2027-5374

Universidad de La Sabana

Agudelo-Cifuentes, Maite Catalina; Berbesi-
Fernández, Dedsy Yajaira; Salazar-Maya, Ángela María
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Aquichan, vol. 22, no. 3, e2235, 2022, July-September
Universidad de La Sabana

DOI: <https://doi.org/10.5294/aqui.2022.22.3.5>

Available in: <https://www.redalyc.org/articulo.oa?id=74172631005>

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Preparation of a Scale for Assessing Nursing Care Needs in Dependent People

✉ **Maite Catalina Agudelo-Cifuentes**

<https://orcid.org/0000-0003-1501-9452>.
Nursing School, Universidad CES, Colombia.
magudeloc@ces.edu.co

Dedsy Yajaira Berbesi-Fernández

<https://orcid.org/0000-0002-1716-957X>.
Nursing School, Universidad CES, Colombia.
dberbesi@ces.edu.co

Ángela María Salazar-Maya

<https://orcid.org/0000-0001-7599-1193>.
Nursing School, Universidad CES, Colombia.
asalazar@ces.edu.co

Received: 06/02/2021

Sent to peers: 10/24/2021

Approved by peers: 03/02/2022

Accepted: 03/17/2022

DOI: 10.5294/aqui.2022.22.3.5

To reference this article / Para citar este artículo / Para citar este artigo

Agudelo-Cifuentes MC, Berbesi-Fernández DY, Salazar-Maya AM. Preparation of a Scale for Assessing Nursing Care Needs in Dependent People. *Aquichan* [Internet]. 2022;22(3):e2235. DOI: <https://doi.org/10.5294/aqui.2022.22.3.5>

Theme: Evidence-based practice.

Contribution to the subject: It is necessary to submit a measuring scale to a validation process that supports its proper use in research or clinical scope. It is in this fact that the main contribution of this research lies, providing the scientific support required for the appropriate application of the theories addressed in the diagnosis and follow-up of dependent patients. In addition, it promotes nurses' use and recognition of Maslow's theory in their clinical practice and research. This scale, which showed good reliability and validity, allows the implementation of care models based on Virginia Henderson's theory and their coordination with the NANDA-I, NOC, and NIC (NNN) standardized languages, which have gained increasing relevance in the nurses' practice.

Abstract

Objective: To prepare and validate a scale for assessing care needs in dependent people, based on all fourteen needs included in Virginia Henderson's theory and Maslow's Theory of Human Needs. **Materials and methods:** An observational study was conducted to validate a scale with a sample of 776 care-dependent individuals. Nursing professionals were in charge of writing the items. Correlations between items and factor structure were evaluated using a structural equation model. Reliability was assessed through Cronbach's alpha and McDonald's omega. **Results:** The correlations between all fourteen needs were satisfactory. The structure with three dimensions (physiological needs, need for safety and belonging, and need for independence) was satisfactory: $CFI = 0.95$, $TLI = 0.94$, $SRMR = 0.04$, and $RMSEA = 0.06$ (95 % CI : 0.05-0.07). The scale's reliability was satisfactory, with Cronbach's alpha = 0.870 and McDonald's omega = 0.871. **Conclusions:** This scale allows obtaining a classification score to determine the nursing assistance needs of dependent people. It contributes to the standardization and use of the theories about care and human needs.

Keywords (Source: DeCS)

Validation study; nursing assistance; nursing care; people with disabilities; nursing theory.

4 Construcción de una escala para la valoración de necesidades de cuidado de enfermería en personas dependientes

Resumen

Objetivos: construir y validar una escala para la valoración de la necesidad de cuidados de personas dependientes con base en las catorce necesidades de la teoría de Virginia Henderson y la teoría de las necesidades humanas de Maslow. **Metodología:** estudio observacional de validación de escala con una muestra de 776 personas dependientes de cuidado. Construcción de los ítems a cargo de profesionales de enfermería. Se evaluaron correlaciones entre ítems y estructura factorial por medio de un modelo de ecuaciones estructurales. Análisis de fiabilidad mediante alfa de Cronbach y omega de McDonald. **Resultados:** las correlaciones entre las catorce necesidades fueron satisfactorias. La estructura de tres dimensiones (necesidades fisiológicas, necesidad de seguridad y afiliación y necesidad de independencia) fue satisfactoria: $CFI = 0,95$; $TLI = 0,94$; $SRMR = 0,04$ y $RMSEA = 0,06$ (IC 95%: 0,05-0,07). La fiabilidad de la escala fue satisfactoria, con alfa de Cronbach = 0,870 y omega de McDonald = 0,871. **Conclusiones:** esta escala permite obtener un puntaje de clasificación para conocer la necesidad de ayuda por parte de enfermería de la persona dependiente. Por lo tanto, es un aporte a la estandarización y el uso objetivo de las teorías sobre el cuidado y las necesidades humanas.

Palabras clave (Fuente: DeCS)

Estudio de validación; atención de enfermería; cuidado de enfermería; personas con discapacidad; teoría de enfermería.

Construção de uma escala para avaliação das necessidades de cuidados de enfermagem em pessoas dependentes

Resumo

Objetivos: construir e validar uma escala de avaliação das necessidades de cuidado de pessoas dependentes, com base nas quatorze necessidades da teoria de Virginia Henderson e na teoria das necessidades humanas de Maslow. **Metodologia:** estudo observacional de validação de escala com amostra de 776 pessoas dependentes de cuidados. Construção dos itens pelos profissionais de enfermagem. As correlações entre os itens e a estrutura fatorial foram avaliadas por meio de um modelo de equação estrutural. Análise de confiabilidade com utilização dos coeficientes alfa de Cronbach e ômega de McDonald. **Resultados:** as correlações entre as quatorze necessidades foram satisfatórias. A estrutura de três dimensões (necessidades fisiológicas, necessidade de segurança e afiliação e necessidade de independência) foi satisfatória: $CFI = 0,95$; $TLI = 0,94$; $SRMR = 0,04$ e $RMSEA = 0,06$ (IC 95%: 0,05-0,07). A confiabilidade da escala foi satisfatória, com alfa de Cronbach = 0,870 e ômega de McDonald = 0,871. **Conclusões:** esta escala permite obter um escore de classificação para avaliar as necessidades de cuidados de enfermagem de pessoas dependentes. Implica uma contribuição para a padronização e o uso objetivo de teorias sobre o cuidado e as necessidades humanas.

Palavras-chave (Fonte: DeCS)

Estudo de validação; assistência de enfermagem; cuidados de enfermagem; pessoas com deficiências; teoria de enfermagem.

Introduction

One of the main pillars of nursing is to provide care according to patients' and communities' needs. Nursing is a discipline that grounds its performance on theoretical models that support the elaboration of a diagnosis based on the patient's needs and favor decision-making, planning, and evaluation of the interventions (1). Using theoretical models allows for a common language among professionals and grounding the decisions on updated evidence (2).

In turn, the concept of "need" has been present in different disciplines. In the social sciences, Abraham Maslow stands out with the *sequential* notion of needs (3) since, according to this author, specific human needs prevail over others. Consequently, he identifies five major groups of human needs according to their differences regarding relevance. He allocates the priority ones to the first four places and those related to self-improvement to the fifth place. The first group consists of physiological needs related to the person's survival; therefore, Maslow places them at the pyramid base. Upon a deficit of all needs, the body will be dominated by the physiological ones, whereas the others will be moved to the background.

The second group of needs is related to the person's safety. Although it can be more relevant during childhood, it is not exclusive to this stage because the very nature of human beings requires protection against danger and vulnerability. Subsequently, we find the social and affiliation or belonging needs framed in the scope of interpersonal relationships. In the fourth group, Maslow places the needs related to esteem and concern about achieving skills and status. This group includes the need for self-assessment and evaluating others or social success. Meeting this group of needs provides self-confidence and a feeling of usefulness and sufficiency to a person. Finally, according to Maslow's theory, the pyramid summit comprises the self-fulfillment or self-improvement needs to be met by opportunities to develop each person's maximum potential (4).

In the work entitled *Nursing: The Philosophy and Science of Caring* (5), Watson describes how care-related factors assist in meeting human needs. She identifies the biophysical and psychophysical needs as lower order, the psychosocial needs as higher-order, and the intra- and interpersonal needs as top order (5). According to the theory, there are four human conservation principles and basic needs: energy conservation, structural integrity conservation, personal integrity conservation, and social integrity conservation (6).

In turn, Roy focuses on four adaptation modes of the person as a system: physiological, self-concept, role, and interdependence (7). On the one hand, Orlando acknowledges the need for help in people, and nurses are the individuals who will have to meet them (8). Wiedenbach indicates that it is necessary to "identify the patient's need for help, provide the help required, and verify that the need for help has been met" (9). On the other hand, although Leininger does

not delve further into the concept of “need,” she implicitly accepts the basic need when she acknowledges universal care and defines it as “help, support, or stimulating behaviors that ease or improve a person’s situation” (10).

One of the primary care models on which nurses’ performance is grounded is Virginia Henderson’s, which has practical application and is framed within the human needs model. According to this theory, individuals are comprehensive beings with biological, psychological, sociocultural, and spiritual components that require complete satisfaction of fourteen basic needs to attain their highest potential. When one of these needs cannot be met independently, help from others is necessary to maintain harmony and integrity (2). At that moment, nurses play a complementary role in meeting these needs through the care provided (1). These needs interact with each other, for which they cannot be analyzed in isolation; in addition, although inherent to all human beings, how they are met differs according to each person’s characteristics (2).

The number of people with care needs tends to increase, mainly potentiated by the demographic changes that have led to accelerated population aging in Latin America. Added to the unhealthy conditions under which the population is aging, this rapidly increases the number of frail or dependent individuals who require care and support to perform their basic activities. However, the need for care is not a condition exclusively inherent to old age (11–13).

The approach to a nursing care plan must be anchored in the identification of a person’s priority needs; for this reason, applying valid and reliable scales to support these decisions enables professionals to provide care grounded on an objective diagnosis that directs not only the implementation of the interventions but also their subsequent evaluation (14,15).

Currently, few instruments are used in nursing to assess care needs in dependent people. Three tools stand out among them: the Cardiovascular Nursing assessment instrument with Virginia Henderson’s approach, validated by Montesinos Jiménez *et al.* (16); the Nursing assessment instrument on Palliative Care needs for pediatric patients by Instituto Nacional de Salud del Niño, validated in 2017 by Cairo (17); and the scale designed by Jorge, which allows assessing patients’ needs and satisfying factors in end-of-life care, based on Max Neef’s needs (18). Other validated instruments employed by nursing professionals focus on the prevention of pressure ulcers in hospitalized patients (19), the nursing professionals’ communication skills (20), and the nursing care protocol for newborns regarding pain treatment (21).

This research aimed to elaborate and validate a scale for assessing the care needs of dependent people based on all fourteen

Materials and methods

An analytical, empirical, and observational study was conducted to validate a scale. The study population consisted of 776 care-dependent individuals. Regarding the inclusion criteria, the study participants were care-dependent individuals from the municipality of Envigado, Antioquia, registered in the caregiver program database in 2020. Those who refused to participate in the program or give their informed consent were excluded.

An official sampling framework with information about the families who benefited from the program was used for data collection. Previously trained and standardized nursing professionals assessed all fourteen needs. The assessment was conducted on the individuals who accepted to participate in the caregiver program. Such assessment was accompanied by a questionnaire that included sociodemographic questions about the care-dependent individuals and the Delta test to evaluate functional dependence, answered by the care-dependent person or the caregiver, depending on the patient's clinical condition.

Preparation and validation of the instrument

Nursing professionals were responsible for writing the questions for assessing all fourteen needs, taken from Virginia Henderson's theory. The measuring instrument was reviewed and tested as a pilot to control information biases. The research team performed due quality control of the information collected.

The starting points were Virginia Henderson's theory and Maslow's Theory of Human Needs to validate the scale proposed with fourteen needs. Three dimensions were structured in this sense: physiological needs (six items), need for safety and belonging (five items), and need for independence (three items). The items were measured on an ordinal categorical scale: 1. No difficulty; 2. Some difficulty; and 3. Needs help or does not do it.

According to Maslow's theory, the first dimension corresponds to physiological or basic needs. It includes breathing, eating and drinking, urinary and fecal eliminations, sleep and good rest, body temperature maintenance, and staying conscious and oriented. The second dimension is divided into two groups from Maslow's pyramid: the need for safety and protection and the need for affiliation or belonging. Consequently, this second dimension included family support, ability to communicate, preservation of social life, engagement in recreational activities, and participation in learning activities. In turn, the third dimension, called "need for independence," is delimited by the need for high esteem proposed by Maslow. It refers

to self-confidence, competence, and independence, where the ability to move, get dressed and undressed without help, and perform self-hygiene was included (3).

A valid and reliable instrument to measure functional dependence (Delta test) was used for construct validation of the scale with fourteen needs.

Data analysis

Regarding statistical data, the care-dependent individuals were characterized using absolute and relative frequencies and central tendency and dispersion measures. Additionally, the chi-square statistical test and its respective *p*-value were used to identify significant differences between some characteristics.

In addition, exploratory factor analysis was developed to approach the dimensionality of the “needs” construct. As a sample adequacy measure, the Kaiser-Meyer-Olkin index was calculated, also performing Bartlett’s sphericity test. Similarly, the polychoric correlation matrix was prepared (22), considering the ordinal level at which all fourteen needs were measured (23,24).

Confirmatory factor analysis was performed to test the theoretical construct of all three dimensions, based on Virginia Henderson’s and Abraham Maslow’s theoretical frameworks. Thus, a structural equation model was developed using the maximum likelihood method. The following goodness-of-fit indices were obtained to determine the statistical efficiency of the model: Standardized Root Mean Residual (SRMR); Root Mean Square Error of Approximation (RMSEA), with its confidence interval (95 % CI); Comparative Fit Index (CFI); and Tucker-Lewis Index (TLI) (25).

The weights of variables, correlations between the latent variables, and variance percentage explained by each factor were analyzed. In addition, the modification indices were obtained, and, based on them, some correlations were established between the error terms to improve the model fit.

Likewise, the model reliability was analyzed through Cronbach’s alpha and McDonald’s omega (26). The dependent people’s scores were also obtained for each dimension and the total scale. All the items were considered and weighted according to each dimension, following Maslow’s theory, in which the needs located at the pyramid base are more relevant. These items were assigned higher weights (doubled) than the others. This way, scores between 20 and 60 are obtained; the higher the score, the greater the care need.

For construct validation of the care need scale, the final scores were correlated to those obtained in the Delta scale. The statis-

Results

Sociodemographic characterization of the care-dependent people

Most of the 776 care-dependent individuals were women (66.9 %); 58.9 % were 80 years old or older, and only 1.8 % were under 20. Age distribution behaved differently between men and women ($\chi^2 = 27.6$; $p < 0.001$), as 91.5 % of the women were over 60 years old, whereas the men over that age represented 78.6 % (Figure 1).

Figure 1. Distribution according to the gender and age of the care-dependent people from the caregiver program.



Source: Own elaboration

Basic needs of the care-dependent people according to Virginia Henderson's theory and Abraham Maslow's human needs

Regarding the "physiological needs" component, one-third of the care-dependent individuals required help for urinary or fecal eliminations. In addition, 26.9 % had difficulties staying conscious or oriented. The need for help to breathe and maintain body temperature was found in less than 10 % of the participants. On the other hand, nearly half of the participants needed help moving, performing body hygiene, and getting dressed and undressed (Table 1).

Table 1. Characterizing the care-dependent people's needs according to all fourteen needs included in Virginia Henderson's theory and Abraham Maslow's human needs

| Dimension | Need | Needs help/ Does not do it | | Does it with difficulty | | No difficulty | |
|----------------------------------|--|----------------------------------|------|----------------------------|------|---------------|------|
| | | n | % | n | % | n | % |
| Physiological needs | Breathing (N1) | 72 | 9.3 | 157 | 20.2 | 547 | 70.5 |
| | Eating and drinking (N2) | 186 | 24.0 | 192 | 24.7 | 398 | 51.3 |
| | Eliminations (urinary and fecal) (N3) | 245 | 31.6 | 193 | 24.9 | 338 | 43.6 |
| | Sleeping (rest-related problems) (N6) | 152 | 19.6 | 276 | 35.6 | 348 | 44.8 |
| | Maintaining body temperature (N7) | 63 | 8.1 | 133 | 17.1 | 580 | 74.7 |
| | Staying conscious and oriented (N10) | 209 | 26.9 | 202 | 26.0 | 365 | 47.0 |
| Need for safety and belonging | Having family support (N9) | 112 | 14.4 | 154 | 19.8 | 510 | 65.7 |
| | Ability to communicate (N11) | 154 | 19.8 | 201 | 25.9 | 421 | 54.3 |
| | Preserving social life (N12) | 311 | 40.1 | 206 | 26.5 | 259 | 33.4 |
| | Engaging in recreational activities (N13) | 440 | 56.7 | 177 | 22.8 | 159 | 20.5 |
| | Participating in learning activities (N14) | 466 | 60.1 | 164 | 21.1 | 146 | 18.8 |
| Need for independence | Motion (moves) | 403 | 51.9 | 219 | 28.2 | 154 | 19.8 |
| | Getting dressed and undressed | 380 | 49.0 | 169 | 21.8 | 227 | 29.3 |
| | Body hygiene (to have a bath) | 391 | 50.4 | 150 | 19.3 | 235 | 30.3 |

Source: Own elaboration

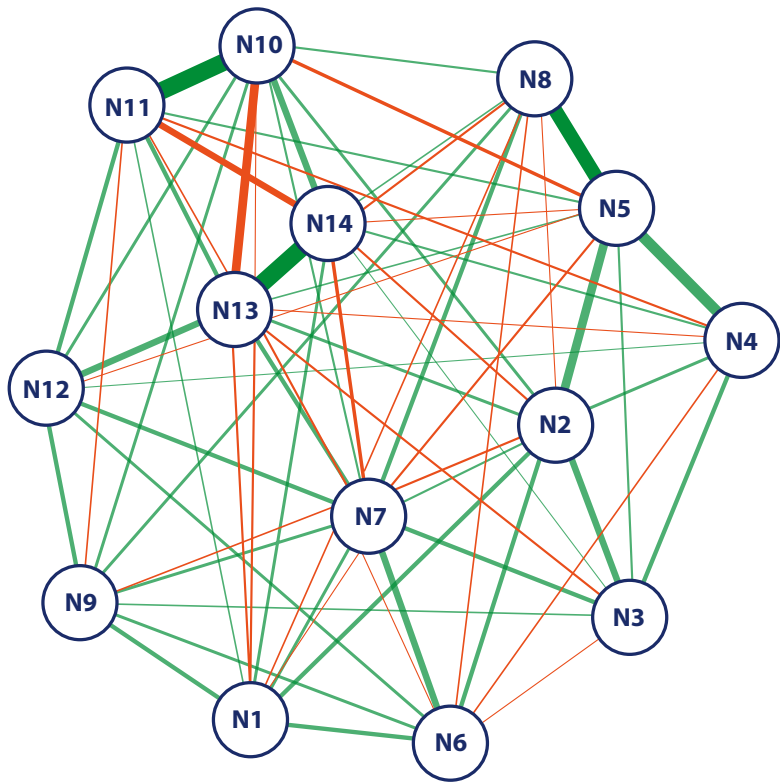
Validation of the care need scale according to Virginia Henderson's theory and Maslow's human needs

The correlations between all fourteen needs were satisfactory, and the strongest ones were observed in the items from the "need for independence" dimension. Consequently, the need for help to get dressed and undressed and to perform self-hygiene (correlation coefficient = 0.94) and the need to engage in recreational activities and participate in learning activities (correlation coefficient = 0.93) had a high correlation (Figure 2).

Regarding the scale's factor structure, the Kaiser-Meier-Olkin test yielded a satisfactory score of 0.86, which indicates sample adequacy. Likewise, the result of Bartlett's sphericity test was significant ($X^2 = 5.343$, $p < 0.001$).

The scale's reliability was satisfactory, with Cronbach's alpha = 0.870 and McDonald's omega = 0.871 in the scale's total score. The mean score of the items was 2.1, with a standard deviation of 0.48. The homogeneity of the scale was determined based on the correlation between each item and the total scale. Most correlations had values from 0.4 to 0.7, indicating that the scale has a good discriminant ability and that the items are targeted at measuring the same construct (Table 2).

Figure 2. Polychoric correlation between all fourteen needs included in Virginia Henderson’s theory and Maslow’s human needs.



Source: Own elaboration

Table 2. Descriptive statistical data for all 14 items of the care need scale

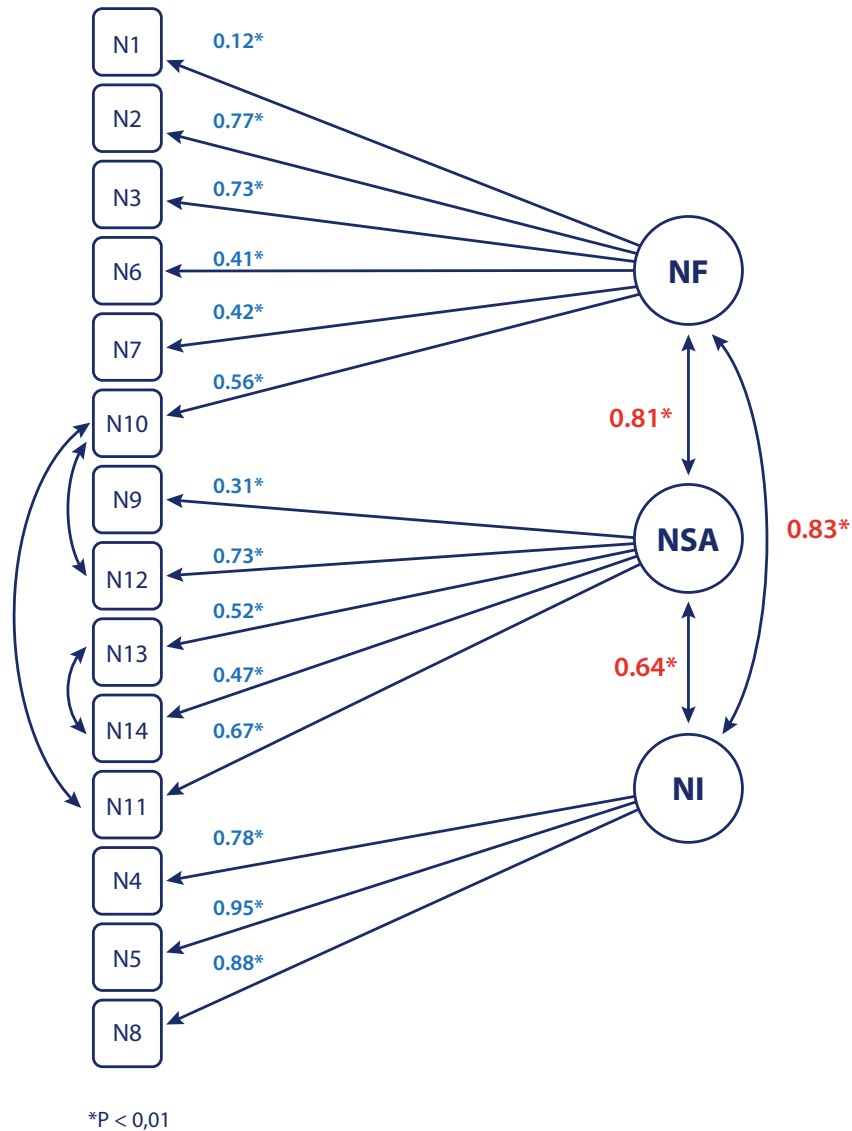
| | Mean | SD | V | If the item is removed | | Item-scale correlation |
|---|------|-------|-------|------------------------|----------|------------------------|
| | | | | α | Ω | |
| N1. Breathing | 2.61 | 0.651 | 0.424 | 0.88 | 0.88 | 0.13 |
| N2. Eating and drinking | 2.27 | 0.824 | 0.679 | 0.86 | 0.86 | 0.66 |
| N3. Eliminations (urinary and fecal) | 2.12 | 0.859 | 0.738 | 0.86 | 0.86 | 0.61 |
| N4. Motion (moves) | 1.68 | 0.785 | 0.616 | 0.86 | 0.86 | 0.62 |
| N5. Getting dressed and undressed | 1.80 | 0.863 | 0.744 | 0.85 | 0.85 | 0.72 |
| N6. Sleeping (rest-related problems) | 2.25 | 0.762 | 0.581 | 0.87 | 0.87 | 0.41 |
| N7. Maintaining body temperature | 2.67 | 0.621 | 0.385 | 0.87 | 0.87 | 0.38 |
| N8. Body hygiene (to have a bath) | 1.80 | 0.876 | 0.767 | 0.85 | 0.85 | 0.69 |
| N9. Having family support | 2.51 | 0.734 | 0.539 | 0.87 | 0.87 | 0.32 |
| N10. Staying conscious and oriented | 2.20 | 0.837 | 0.700 | 0.86 | 0.86 | 0.60 |
| N11. Ability to communicate | 2.34 | 0.790 | 0.623 | 0.86 | 0.86 | 0.61 |
| N12. Preserving social life | 1.93 | 0.855 | 0.731 | 0.86 | 0.86 | 0.60 |
| N13. Engaging in recreational activities | 1.64 | 0.801 | 0.642 | 0.86 | 0.87 | 0.48 |
| N14. Participating in learning activities | 1.59 | 0.787 | 0.619 | 0.86 | 0.87 | 0.48 |

SD: Standard Deviation; V: Variance; α : Cronbach’s alpha; Ω : McDonald’s omega.

Source: Own elaboration

Confirmatory factor analysis was performed to confirm the three-dimension factor structure according to Maslow's Theory of Human Needs, yielding the following initial fit indices: $CFI = 0.83$, $TLI = 0.79$; $SRMR = 0.122$, and $RMSEA = 0.127$ (95 % CI : 0.120-0.134). Although all the correlation coefficients between the error terms were set to zero, some were freed to favor the model fit, considering the resulting modification indices (Figure 3).

Figure 3. Confirmatory factor analysis for validation of the three-dimension theoretical model of the scale to assess care needs in dependent people.



Source: Own elaboration

After assigning the residual covariances, the fit indices of the model were satisfactory; for example, CFI showed a good fit ($CFI = 0.95$). Similarly, TLI , a comparative index between the proposed model and a naive one, also showed a good fit ($TLI = 0.94$). $SRMR$, which evaluates the plausibility that the sample and estimated matrices are identical, showed a good fit ($SRMR = 0.04$), and so did $RMSEA = 0.06$ (95 % CI : 0.05-0.07).

As expected, the residual covariance matrix yielded small and satisfactory values, indicating slight differences between the matrix of population covariances estimated by the model and the sample matrix. Good covariation is also observed between all three dimensions: Covariance is higher between the “physiological needs” and “need for independence” dimensions (standardized correlation = 0.83) (Table 3). All the standardized and non-standardized factor loadings were within the expected ranges. Likewise, their standard errors were minor and satisfactory. Regarding the *t* statistical value, it was significant for all the variables.

For the “physiological needs” dimension, the “eating and drinking” and “urinary and fecal eliminations” variables were the ones with the highest factor loadings (standardized) regarding the dimension (0.77 and 0.74, respectively). In contrast, the “breathing” need had low loading with the factor (0.12); however, its loading was significant ($Z = 3.15$; $p = 0.002$). In the case of the “need for independence” dimension, satisfactory loadings were observed in all its variables, with the highest being the “need for help to get dressed and undressed” (0.96). Regarding the “need for safety and belonging” dimension, the variable that most strongly loaded the factor was the “need for help to preserve social life” (0.73). As to the covariances between the factors (standardized estimation), all three dimensions are satisfactorily correlated (Table 3).

Table 3. Estimation of the factor loadings

| | | | | 95 % confidence interval | | | | |
|-------------------------------|----------|----------------|----------------|--------------------------|-------|-------|---------|----------------------|
| Factor | Variable | Factor loading | Standard error | Lower | Upper | Z | p | Standardized loading |
| Physiological needs | N1 | 0.0793 | 0.0252 | 0.0299 | 0.129 | 3.15 | 0.002 | 0.122 |
| | N2 | 0.6386 | 0.0268 | 0.5861 | 0.691 | 23.86 | < 0.001 | 0.776 |
| | N3 | 0.6250 | 0.0285 | 0.5691 | 0.681 | 21.93 | < 0.001 | 0.728 |
| | N6 | 0.3119 | 0.0284 | 0.2563 | 0.367 | 11 | < 0.001 | 0.409 |
| | N7 | 0.2602 | 0.023 | 0.2151 | 0.305 | 11.3 | < 0.001 | 0.42 |
| | N10 | 0.453 | 0.0306 | 0.3929 | 0.513 | 14.78 | < 0.001 | 0.548 |
| Need for safety and belonging | N9 | 0.2309 | 0.0288 | 0.1743 | 0.287 | 8 | < 0.001 | 0.315 |
| | N11 | 0.5205 | 0.0295 | 0.4628 | 0.578 | 17.67 | < 0.001 | 0.67 |
| | N12 | 0.6183 | 0.0314 | 0.5568 | 0.68 | 19.72 | < 0.001 | 0.73 |
| | N13 | 0.4133 | 0.0309 | 0.3528 | 0.474 | 13.39 | < 0.001 | 0.516 |
| | N14 | 0.3726 | 0.0306 | 0.3126 | 0.433 | 12.17 | < 0.001 | 0.474 |
| Need for independence | N4 | 0.6139 | 0.0239 | 0.567 | 0.661 | 25.63 | < 0.001 | 0.783 |
| | N5 | 0.8244 | 0.0235 | 0.7784 | 0.87 | 35.09 | < 0.001 | 0.956 |
| | N8 | 0.7729 | 0.0251 | 0.7236 | 0.822 | 30.75 | < 0.001 | 0.883 |

Source: Own elaboration

Reliability of the scale

As a first step, reliability was analyzed for the dimensions proposed, finding that the dimension with the highest internal consistency was the “need for independence” (Cronbach’s $\alpha = 0.904$; McDonald’s $\omega = 0.908$), immediately followed by the “need for safety and belonging” dimension (Cronbach’s $\alpha = 0.752$; McDonald’s $\omega = 0.773$). In turn, although with the lowest internal consistency, the “physiological needs” dimension had some satisfactory values, showing that its items are targeted at measuring the same construct (Cronbach’s $\alpha = 0.691$; McDonald’s $\omega = 0.699$).

Final score

The mean score for the “physiological needs” dimension was 19.8 ($SD = 5.75$). For the second dimension, “need for safety and belonging,” the mean score was 10 ($SD = 2.81$). For the third dimension, “need for independence,” the mean score was 7 ($SD = 2.31$).

A typification process was conducted to standardize the result of all three dimensions of the scale with fourteen needs, and, subsequently, a score between 1 and 5 was assigned according to the typified value: 1 = Z scores below -1.5; 2 = Z scores below -0.5; 3 = Z scores below 0.5; 4 = Z scores below 1.5; and 5 = Z scores above 1.5, where 1 indicates little care need and 5 total care need.

Construct validity

The overall mean score of the scale was 36 ($SD = 9.43$). In turn, the Delta test had a mean score of 23 ($SD = 12.5$). The correlation between these two scales, expected to be positive, yielded a satisfactory value (Spearman’s correlation coefficient = 0.84; $p < 0.01$). The final scale is presented in Figure 4.

Discussion

Nursing has become the Care Science (2) thanks to the adoption of several theories, the development of nursing care models, and the inclusion of the scientific method in professional practice. Understood as an organized set of diverse knowledge endorsed by the scientific community, theories provide the nursing profession with fundamental grounds to understand the reality in which care is contextualized and guide the identification of the specific action to be taken in each situation (28).

Using the scientific method in care has enabled nurses to apply a systematic work system, standardize care, and evaluate and follow up on the therapeutic interventions or programs aimed at health recovery or at support and assistance in the face of a lack of independence in a person to meet basic needs (29).

Table 4. Scale for assessing nursing care needs in dependent people.

Scale for assessing nursing care needs in dependent people

This scale was developed according to Virginia Henderson’s theory and Maslow’s theory of human needs. It must be used by a nursing professional who responds to each item according to the assessment of the patient.

| Dimension | Need | Score | | |
|-------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------|
| | | No difficulty / Needs little help | Does it with difficulty / Needs help | Does not do it / Needs help |
| Physiological needs | Breathing | 2 | 4 | 6 |
| | Eating and drinking | 2 | 4 | 6 |
| | Eliminations (urinary and fecal) | 2 | 4 | 6 |
| | Sleeping (rest-related problems) | 2 | 4 | 6 |
| | Maintaining body temperature | 2 | 4 | 6 |
| | Staying conscious and oriented | 2 | 4 | 6 |
| Need for safety and belonging | Having family support | 1 | 2 | 3 |
| | Ability to communicate | 1 | 2 | 3 |
| | Preserving social life | 1 | 2 | 3 |
| | Engaging in recreational activities | 1 | 2 | 3 |
| | Participating in learning activities | 1 | 2 | 3 |
| Need for independence | Motion (moves) | 1 | 2 | 3 |
| | Getting dressed and undressed | 1 | 2 | 3 |
| | Body hygiene (to have a bath) | 1 | 2 | 3 |

Source: Own elaboration

Nursing is grounded on multiple theories and conceptual models, both of its own and derived from other sciences; some have historical importance, such as Virginia Henderson’s theory of fourteen needs, which focused on Humanistic Nursing and the needs models. This theory is currently used globally in higher education and clinical activity (28). Such theory is the basis of the current research, which also incorporates Abraham Maslow’s theoretical proposal, grounded on Humanistic Psychology, to achieve nursing diagnoses based on human needs. This proposal also contemplates the author’s postulates, which indicate that some of these needs, which are essential or elementary, prevail over others (4).

Accordingly, a theoretical model was put to the test that incorporates Virginia Henderson's fourteen needs coordinated with Maslow's Theory of Basic Needs, which sustains the existence of a natural hierarchy among the different needs. The statistical model corroborated the covariation among all three dimensions proposed, where the predominance of covariation between "physiological needs" and the other two dimensions ("need for safety and belonging" and "need for independence") is also noted, as supported by the sequential notion of needs proposed by the theorist (30).

According to Maslow's postulates, the pyramid summit represents the need for self-fulfillment or self-improvement. These needs are considered of a higher or developmental order, and their importance is only realized after meeting the necessities. Considering that this research sought to assess a scale to measure care needs in dependent people, where meeting the priority needs prevails, the need for self-fulfillment was not contemplated. If a person does not have their needs from the first stage met, they will hardly be able to reach the higher-order ones (31). According to Maslow, for a person to be able to initiate a self-fulfillment process, they must have previously met many needs, among which independence and self-functional ability prevail (32). Consequently, this scale is focused on the deficit or lower-order needs, which, according to Maslow, are the "physiological," "safety and belonging," and "esteem" needs. The importance of this group of needs lies in the fact that, if any distortion occurs in them, psychological or physiological problems can arise in the person (32).

The findings from the current research show that the assessment of all fourteen needs yielded satisfactory results for consistency and correlation. Although most needs are satisfactorily correlated with each other, such correlation was much more robust in some, such as the need for help to get dressed and undressed and to perform body hygiene, both belonging to the "need for independence" dimension. The strong correlation between them reflects the need for help resulting from a lack of physical or mental autonomy, which can be due to age, disease, or disability, making the person require assistance and help for these two essential activities in daily living (31).

Furthermore, there was a high correlation between the need for help to engage in recreational activities and to participate in learning activities. It should be emphasized that the current scale is guided towards assessing the care needs of people with some dependence degree, where it is possible to find deficits to adequately meet the needs that prevail over them, such as the physiological ones.

A high correlation was also observed between the need for help to stay conscious and oriented and the need for help to commu-

nicate. Despite belonging to different dimensions, they reflect the dependence degree of the “need for safety and belonging” and the “need for independence” with the elementary ones, which are the physiological needs, the group that includes the need for help to stay conscious and oriented. In addition, this is a fundamental condition for maintaining proper communication with others (31).

In line with the above, it was observed that, in the initial confirmatory factor model, the modification indices suggested the need to establish correlations between the error terms of the previously discussed needs to favor the model fit. It was satisfactorily attained after adding such correlations that are not only supported in the statistical aspect (33) but also in the theoretical one, already discussed.

Strikingly, the need for help to breathe, included in the “physiological needs” dimension, had low correlations compared to the others, mainly referring to the “need for independence.” Likewise, when evaluating the item-scale correlation, it was the one with the lowest value, differing substantially from the rest of the needs. However, the need for help to breathe was detected in less than 10 % of the dependent people used for this validation.

Nonetheless, when evaluating the consistency of the measurements, it was satisfactory (Cronbach’s alpha = 0.87) and did not show any substantial improvement when removing the first need (Cronbach’s alpha = 0.88). When scale validation procedures are performed, quantifying the existing correlations between the items is an initial step, indicating whether the scale has a valid underlying construct (26,34).

In this sense, the scale’s internal consistency with fourteen needs proposed yielded values within the ranges suggested by various authors (34). It is worth clarifying that, although the need for help to breathe has not shown adequate consistency with the measurements of the other needs, it is indeed part of the vital and physiological needs presented by Maslow, and its presence in the scale is fundamental (4).

As expected, the consistency of the measurements within each dimension was high, reflecting the coherence of these dimensions with the underlying theory (34,35). In this sense, the “need for independence” was the dimension that showed the highest consistency in its measurements (Cronbach’s alpha = 0.90; McDonald’s omega = 0.90), despite being the one represented by the fewest number of needs. This dimension is followed by the “need for safety and belonging” and “physiological needs”; in the latter, internal consistency may have been affected by the low variability and correlation of the need for help to breathe, as previously discussed.

The three-dimension model proposed for assessing care needs in dependent people showed a satisfactory fit to its underlying theory. The tests to evaluate if the model is adequate or not were sat-

isfactory; such tests are mainly based on comparing the model proposed with a naive one, where the greatest similarity possible is sought between them (33). Consequently, in addition to obtaining satisfactory values in the indices analyzed, comparing the residual and estimated matrices of population covariances yielded small values that indicate minor differences (33).

In the “physiological needs” dimension, the needs for help to eat and drink and in urinary and fecal eliminations were the ones with the highest weight for the dimension. On the one hand, regarding the “need for independence” dimension, the needs for help to get dressed and undressed and to perform body hygiene were the ones with the highest weight in the dimension representation, mainly explained by the high number of older adults in whom the need for help to perform basic activities of daily living increases with age (36). Concerning this last dimension, it is part of what Maslow calls the “need for high esteem,” which refers to the search for self-recognition, self-confidence, self-value, and self-acceptance, aspects that can be strongly affected by dependence to carry out these two essential activities of daily living that prevailed in this dimension (32).

On the other hand, regarding the “safety and belonging” group of needs, the need for help to preserve social life is the one that most strongly represents the dimension. It is worth emphasizing that once the physiological needs are met, the one related to feeling rooted in a place and socially integrated becomes the strength that dominates an individual’s personality (32).

The scale proposed to evaluate the care needs in dependent people includes the assessment of each of the fourteen needs on a scale that assigns a score varying from little need for help (1) to total need for assistance by nursing professionals (3). The final sum of the scores is grouped into the three dimensions proposed according to Maslow’s theory: physiological needs, need for safety and belonging and need for independence. According to Maslow’s postulates, the current scale suggests assigning double weight to the score of the physiological needs, as they are predominant in human beings and, similarly, that the search to meet them should prevail over the others (4), as they are fundamental for the very survival of the person (31).

Nursing plays a fundamental role in meeting the basic needs of dependent people and in helping to optimize internal and external resources; in addition, it assists in compensating deficits and defines the interventions to be implemented during the care and recovery of patients (37). Standardization and objective use of the different theories about care and human needs allows the nursing profession to employ objective measurements to quantify the care needs and follow up on patients. In addition, it contributes to the development and strengthening of the discipline (2).

Measuring scales allow for quantifying the different states related to people's health and providing care centered on needs while monitoring patients' evolution. However, to ensure the proper use of a measuring scale, it is necessary to submit it to a validation process that supports its use, whether in research or clinical scope (34). It is in this fact that the main contribution of this research lies, providing the scientific support required for the proper use of both theories addressed in the diagnosis and follow-up of dependent patients. In addition, it promotes nurses' use and recognition of Maslow's theory in their clinical practice and research (38).

In addition, this scale, which showed good reliability and validity and is grounded on both theories presented, allows the implementation of care models based on Virginia Henderson's theory and their coordination with the NANDA-I, NOC, and NIC (NNN) standardized languages, which have gained increasing relevance in the nurses' practice (2,39,40).

Finally, for future research studies, we suggest validating the instrument content with experts from different countries to officially authorize its use in various contexts.

Conclusions

The scale prepared and validated for assessing care needs in dependent people, based on all fourteen needs included in Virginia Henderson's theory, consists of three dimensions whose grounds and sequentiality are anchored in Maslow's Theory of Human Needs. The items had satisfactory correlations with each other, as was also the case in the dimensions. This scale allows obtaining a classification score to determine the nursing assistance needs of dependent people. This scale represents a contribution to standardization and objective use of the theories about care and human needs, which enables the nursing profession to employ objective measurements to quantify the care needs and follow up on patients.

Conflicts of interest: None declared.

References

1. Barrett EAM. Again, what is nursing science? Nurs. Sci. Q. [Internet]. 2017 mzo. 24;30(2):129-33. doi: <https://doi.org/10.1177/0894318417693313>
2. Bellido JC, Lendínez JF, coordinadores, Colegio Oficial de Enfermería de Jaén, editor. Proceso enfermero desde el modelo de cuidados de Virginia Henderson y los lenguajes NNN [Internet]. Jaén (ES): Ilustre Colegio Oficial de Enfermería de Jaén; 2012 [citado 2021 abr. 25]. Disponible en: <http://www.index-f.com/lascasas/documentos/lco714.pdf>
3. Maslow, A. El hombre autorrealizado: hacia una psicología del ser. 9 ed. Barcelona: Kairós; 1991. 360 p.
4. Castro-Molina FJ. Abraham Maslow, las necesidades humanas y su relación con los cuidadores profesionales. Cult. cuid. [Internet]. 2018;22(52):102-108. DOI: <https://doi.org/10.14198/cuid.2018.52.09>
5. Watson J. Nursing: The philosophy and science of caring. Colorado: University Press of Colorado; 2008. 336 p.

6. Raile M, Marriner A. Modelos y teorías en enfermería. 1ª edición. Barcelona: Elsevier; 2018. Capítulo 5, Teóricas de la enfermería de importancia histórica; p. 54-67.
7. Roy C, Whetsell MV, Frederickson K. The roy adaptation model and research: global perspective. *Nurs. Sci. Q.* [Internet]. 2009 jul. 1; 22(3):209-211. DOI: <https://doi.org/10.1177/0894318409338692>
8. Raile M, Marriner A. Teóricas de la enfermería de importancia histórica. En: Modelos y teorías en enfermería. Barcelona: Elsevier; 2018. p. 22-24.
9. Raile M, Marriner A. Teóricas de la enfermería de importancia histórica. En: Modelos y teorías en enfermería. Barcelona: Elsevier; 2018. p. 16-17.
10. McFarland MR, Wehbe-Alamah HB. Leininger's theory of culture care diversity and universality: An overview with a historical retrospective and a view toward the future. *J. Transcult. Nurs.* [Internet]. 2019 nov. 1; 30(6):540-557. DOI: <https://doi.org/10.1177/1043659619867134>
11. Arias C, Soliveres C, Bozzi N. El envejecimiento poblacional en América Latina. Aportes para el delineamiento de políticas públicas. *RELASP* [Internet]. 2020;1(2):11-23. DOI: <https://doi.org/10.35305/rr.v1i2.18>
12. Villalobos Dintrans P. Panorama de la dependencia en Chile: avances y desafíos. *Rev. Med. Chile.* 2019;147(1):83-90. DOI: <https://doi.org/10.4067/S0034-98872019000100083>
13. Aranco N, Stampini M, Ibarrarán P, Medellín N. Panorama de envejecimiento y dependencia en América Latina y el Caribe [Internet]. Inter-American Development Bank; 2018 [citado 2021 jul. 21]. DOI: <https://doi.org/10.18235/0000984>
14. Moorhead S, Swanson E, Johnson M, Maas ML. Clasificación de resultados de enfermería (Noc): medición de resultados en salud. Amsterdam: Elsevier Health Sciences; 2018. 688 p.
15. Manterola C, Grande L, Otzen T, García N, Salazar P, Quiroz G. Confiabilidad, precisión o reproducibilidad de las mediciones. Métodos de valoración, utilidad y aplicaciones en la práctica clínica. *Rev. chil. infectol.* [Internet]. 2018;35(6):680-688. DOI: <https://doi.org/10.4067/S0716-10182018000600680>
16. Montesinos JG, Ortega VMC, Leija HC, Quintero MM, Ayala GC, Suárez M. Validación de un instrumento de valoración de enfermería cardiovascular con el enfoque de Virginia Henderson. *Rev. Mex. Enf. Cardiol.* [Internet]. 2011;19(1):13-20. Disponible en: <https://www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=30773%20-%20-%20text=Conclusiones%3A%20El%20instrumento%20de%20valoraci%C3%B3n,enfermer%C3%A- Da,%20asimismo,%20el%20personal%20de>
17. Cairo de la Cruz KM. Creación y validación de un instrumento de valoración de enfermería en necesidades de cuidados paliativos al paciente pediátrico del Instituto Nacional de Salud del Niño en el 2017 [tesis de grado]. [Perú]: Universidad Nacional Mayor de San Marcos [Internet]; 2018. Disponible en: <https://core.ac.uk/download/pdf/323342318.pdf>
18. Jorge M. Patients' needs and satisfiers: applying human scale development theory on end-of-life care. *Curr. Opin. Support. Palliat. Care.* [Internet]. 2010 sept;4(3):163-169. DOI: <https://doi.org/10.1097/SPC.0b013e32833b286d>
19. León Román CA, Cairo Soler C. Metodología para la protocolización de enfermería en la prevención de úlceras por presión en pacientes hospitalizados. *Rev. Cuba Enferm.* [Internet]. 2020 mzo. 01; [citado 2021 jul. 21];36(1). Disponible en: http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=So864-03192020000100010&lng=es&nrm=iso&tIng=es
20. Leal-Costa C, Tirado González S, Ramos-Morcillo AJ, Díaz Agea JL, Ruzafa-Martínez M, van-der Hofstadt Román CJ. Validación de la escala sobre habilidades de comunicación en profesionales de enfermería. *An. Sist. Sanit. Navar.* [Internet]. 2019;42(3):291-301. DOI: <https://doi.org/10.23938/ASSN.0745>
21. Sandes VA. Protocolo de cuidado de enfermería para el recién nacido con tratamiento del dolor. *Notas Enferm.* [Internet]. 2019 nov. 08;19(34):14-25. Disponible en: <https://revistas.unc.edu.ar/index.php/notasenf/article/view/26319>
22. Freiberg A, Stover JB, de la Iglesia G, Fernández M. Correlaciones policóricas y tetracóricas en estudios factoriales exploratorios y confirmatorios. *Cienc. Psicológicas.* [Internet]. 2013 nov. 30;7(2):151-164. DOI: <https://doi.org/10.22235/cp.v7i1.1057>
23. López-Aguado M, Gutiérrez-Provecho L. Com dur a terme i interpretar una anàlisi factorial exploratòria utilitzant SPSS [Cómo realizar e interpretar un análisis factorial exploratorio utilizando SPSS]. *REIRE.* [Internet]. 2019 jul. 01;12(2):1-14. DOI: <https://doi.org/10.1344/reire2019.12.227057>
24. Pizarro K, Martínez O. Análisis factorial exploratorio mediante el uso de las medidas de adecuación muestral kmo y esfericidad de bartlett para determinar factores principales. *J. Sci. Res.* [Internet]. 2020 dic. 31 [citado 21 de julio de 2021];5:903-924. Disponible en: <https://zenodo.org/record/4453224>
25. Dominguez-Lara S. Correlation between residuals in confirmatory factor analysis: a brief guide to their use and interpretation [Correlación entre residuales en análisis factorial confirmatorio: una breve guía para su uso e interpretación]. *Interacciones* [Internet]. 2019 sept. 01;5(3):e207. DOI: <https://doi.org/10.24016/2019.v5n3.207>
26. Ventura-León JL. ¿Es el final del alfa de Cronbach? Adicciones [Internet]. 2019 [citado 2021 jul. 21];31(1). DOI: <https://doi.org/10.20882/adicciones.1037>
27. The jamovi Project. jamovi (Version 1.6) [Computer Software]. 2021. Disponible en: <https://www.jamovi.org/>
28. León CA. Nuevas teorías en enfermería y las precedentes de importancia histórica. *Rev. Cuba Enferm.* [Internet]. 2017 dic. 27 [citado 2021 my. 05];33(4). Disponible en <http://revenfermeria.sld.cu/index.php/enf/article/view/1587>
29. Alcalde-Parcés P, Vera-Remartínez EJ. Método científico y lenguaje enfermero estandarizado. *Rev. esp. sanid. penit.* [Internet]. 2014 feb. 13 [citado my. 05 2021];16(1). DOI: <https://doi.org/10.4321/S1575-06202014000100001>
30. Lima-Choque V. Validación de la teoría de la motivación humana (jerarquía de las necesidades) de Abraham Maslow en los habitantes de la ciudad de el alto [Tesis]. [La Paz, BO]: Universidad Mayor de San Andrés [Internet]; 2018 [citado 2021 jul. 21]. Disponible en <http://repositorio.umsa.bo/xmlui/handle/123456789/25171>
31. García P, Jiménez PR, Osorio M. Características y necesidades de las personas en situación de dependencia [Internet]. Madrid: McGraw-Hill España; 2013 [citado 2021 my. 05]. Disponible en: <http://site.ebrary.com/id/10693406>
32. Elizalde A, Martí-Vilar M, Martínez-Salvá F. Una revisión crítica del debate sobre las necesidades humanas desde el enfoque centrado en la persona. *Polis rev. Latinoam.* [Internet]. 2006 dic. 2006 [citado 2021 my. 05];15. Disponible en <http://journals.openedition.org/polis/4887>
33. Aldas-Manzano J, Jiménez UE. Análisis multivariante aplicado con R. 2ª ed. España: Ediciones Paraninfo, S.A.; 2017. 682 p.
34. Oviedo HC, Campo-Arias A. Aproximación al uso del coeficiente alfa de Cronbach. *Rev. Colomb. Psiquiatr.* [Internet]. 2005;XXXIV(4):572-580. DOI: <https://doi.org/10.7705/biomedica.v26i4.327>
35. Ventura-León JL, Caycho-Rodríguez T. El coeficiente Omega: un método alternativo para la estimación de la confiabilidad. *Rev. latinoam. cienc. soc. niñez juv.* 2017;15(1):625-627. Disponible en: <https://www.redalyc.org/pdf/773/77349627039.pdf>

36. Dijkstra A, Yönt GH, Korhan EA, Muszalik M, Kędziora-Korna-towska K, Suzuki M. The care dependency scale for measuring basic human needs: an international comparison. *J. Adv. Nurs.* [Internet]. 2012 feb. 23;68(10):2341-2348. DOI: <https://doi.org/10.1111/j.1365-2648.2011.05939.x>
37. Vargas MY. Algunos fundamentos teóricos para el cuidado de enfermería. *Rev. Mex. de Enfermería Cardiol.* [Internet]. 2007;15(1):28-30. Disponible en: <https://www.medigraphic.com/pdfs/enfe/en-2007/en071f.pdf>
38. Saavedra, KM. Relación entre el conocimiento sobre teoría de las necesidades de Maslow de los enfermeros asistenciales y el nivel de satisfacción de las necesidades del usuario alcanzados mediante la intervención de enfermería en el Hospital II Essalud Tarapoto julio 2004-enero 2005. [Tesis]. [Tarapoto, PE]: Universidad Nacional de San Martín [Internet]; 2005 [citado 2021 my. 05]. Disponible en: <http://repositorio.unsm.edu.pe/handle/11458/1262>
39. Campos C, Jaimovich S, Wigodski BJ, Aedo V. Conocimientos y uso clínico de la metodología enfermera (NANDA, NIC, NOC) en enfermeras/os que trabajan en Chile. *Rev. Iberoam. Educ. investi. Enferm.* [Internet]. 2017; 7(1):33-42. Disponible en: https://www.researchgate.net/publication/312167211_CONOCIMIEN-TOS_Y_USO_CLINICO_DE_LA_METODOLOGIA_ENFER-MERA_NANDA_NIC_NOC_EN_ENFERMERASOS_QUE_TRA-BAJAN_EN_CHILE
40. Román M, Campos A, Viñas C, Palop R, Zamudio A, Domingo R, et al. Las taxonomías enfermeras NANDA, NOC y NIC en la práctica asistencial hospitalaria. *Enferm. Clin.* [Internet]. 2009 en. 06;15(3):163-166. DOI: [https://doi.org/10.1016/S1130-8621\(05\)71103-7](https://doi.org/10.1016/S1130-8621(05)71103-7)