Original Article

Development and Psychometric Evaluation of the Esthetics of Nursing Care Scale

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Abstract

Background: Esthetic knowledge is invaluable to enhance nursing practice to high standards. Therefore, it should be clearly operationalized in a way that facilitates its evaluation. **Objectives:** The purpose of this study was to develop and evaluate the psychometric properties of the Esthetics of Nursing Care Scale (ENCS). **Methods:** This descriptive methodological study was part of a sequential exploratory mixed methods research carried out in 2014. The primary item pool was developed based on the results of a literature review and an interpretive phenomenological study on 12 nursing clients and 14 nurses purposefully recruited from six general and specialty hospitals in Iran. During psychometric evaluation, the face, content, and construct validity as well as internal consistency and stability of the scale were assessed. **Results:** The primary item pool contained 75 items while the final scale consisted of 38 items. Scale-level content validity index was measured twice; the results of both measurements were above 0.90. Exploratory factor analysis showed that the 38-item scale consisted of four factors which explained 60.75% of the total variance. Pearson correlation analysis between the score of the scale and the score of the "Caring Behavior Inventory" yielded a coefficient of 0.84 ($P < 0.001$). The Cronbach's alpha of the scale was 0.96. Moreover, intraclass correlation coefficient for test–retest stability with a 2-week interval was 0.93. **Conclusion:** The 38-item ENCS has high and acceptable validity and reliability. Therefore, it can be employed as an appropriate instrument for the evaluation of the esthetics and the quality of nursing care from patients' perspectives.

Keywords: *Esthetics, Clinical nursing research, Instrument development, Measurement, Nursing care*

Introduction

Esthetics of nursing care (ANC) is "the appreciation of and empathy for patients' experience, the aggregation of the particulars of nursing into a meaningful whole, and the capacity to design that holistic care creatively." This aspect of nursing care is a potential mechanism for nursing evaluation during the integration of all nursing knowledge forms.[1,2] Nursing scholars believe that ANC is the heart of nursing.[3,4] They introduce the art of nursing as a combination of scientific facts, a creative imagination, and a simultaneous integration of all nursing knowledge. Nursing, as an art, is nurses' understanding of individualized care and their ability to provide care in special circumstances.[5,6] When Carper used art and esthetics to describe nursing, she followed John Dewey's theory of "Art is an Experience." The theory explains that any practice can provide an esthetic quality.[7,8] Due to the great value of esthetic knowledge for nursing, some scholars suggested its inclusion in the curriculum of nursing.

Despite considerable interests in terms of the art and ANC, little attention has been paid to these concepts

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in nursing education, research and practice. Yet, some qualitative and quantitative researches attempted to clarify these concepts.[9,10] For instance, Gramling challenged nursing care by asking the question of, "What is art?" and then, raised the more dynamic and underlying question of "When is the art of the nurse seen?" He believed that there were very few studies which had actually examined the characteristics or the practice of nursing as an art.[11] It is evident that when nurses do not know how to do their duties, the distinction between art and science will not be understandable. This is a major challenge between clinical education and management which necessitates a clear description of esthetic knowledge.[12] Esthetic knowledge is invaluable to enhance nursing practice to high standards; however, its value will not be recognized unless it is clearly operationalized.[13]

Mere clarification of the meaning of ANC does not produce significant outcomes.[6] Rather, the best way to understand a concept is its operationalization and quantification. Watson also highlighted that careful evaluation of nursing needs special frameworks for the evaluation of its esthetic aspects.[14]

There are several tools for nursing care measurement including, but not limited to, "Nyberg Caring Assessment Scale," "Holistic Care Inventory," and "Caring Nurse-Patient Interactions Scale."[15] However, none of these tools are appropriate for ANC measurement. Moreover, the results of our literature search illustrated that there was no ANC-specific measurement tool. Therefore, the present study was undertaken to narrow this gap.

Objectives

The purpose of this study was to develop and evaluate the psychometric properties of the ANC Scale (ANCS).

Methods

This was a descriptive methodological study. The primary item pool was developed based on the contents of twenty valid measurement tools on nursing care quality and the results of an earlier interpretive phenomenological study. The study had been conducted on twelve nursing clients and fourteen nurses purposefully recruited from six general and specialty hospitals in Iran. In that study, data collection and analysis had been done through unstructured interviews and van Manen's hermeneutic phenomenological framework, respectively.[16] The primary item pool contained 75 items.

Assessment of face and content validity

Face validity was assessed through calculating item impact score. Accordingly, twenty patients were asked to evaluate the items in terms of difficulty, appropriateness, and ambiguity and to rate the importance of each using the following five-point scale: "It is quite important": 5, "It is important": 4, "It is moderately important": 3, "It is slightly important": 2, and "It is not important": 1. Thereafter, mean impact score was calculated for each item through the following formula, "impact score = frequency × importance."[17] In addition, the items were evaluated by fourteen faculty members from different universities, some of whom were nurse experts in the area of scale development. Moreover, experts in Persian literature and linguistics reviewed the wording, grammar, and clarity of the items.

To assess content validity, we calculated content validity ratio (CVR) and content validity index (CVI). Accordingly, the abovementioned experts were asked to judge about the essentiality of the items based on the following three-point Likert-type scale: "It is essential": 3: "It is helpful but not essential": 2; and "It is not essential": 1. Then, CVR was calculated using Lawshe's method. Items with a minimum CVR of 0.51 remained in the scale.[18] After that, the experts were asked to review the scale respecting the relevance of the items using the following rating scale: "It is not relevant": 1; "It is partially relevant": 2; "It is relevant": 3; and "It is completely relevant": 4. Afterward, their rating scores were used to calculate CVI. Items with a CVI of 79% or more were kept in the scale, while items with a CVI of 70%–79% and <70% were respectively revised and eliminated.[19] Then, the agreement among the experts respecting the relevance of each item was determined through calculating modified Kappa coefficient based on item-level CVI (I-CVI). Modified Kappa coefficient of >0.74 signified that the evaluation was excellent. Moreover, scale-level CVI average (S-CVI/Ave) was calculated. S-CVI/Ave values of higher than 0.9 were considered as excellent. To ensure the removal or the retention of the items, we asked six other experts to re-evaluate the items more precisely and then once again, CVI and modified Kappa coefficient were calculated for each item.[20]

Assessment of construct and convergent validity

Construct validity was assessed through exploratory factor analysis. Accordingly, a random sample of 332 patients were recruited during the spring and the summer of 2014 from six university hospitals located in Ahwaz, Abadan, and Dezful, Iran. There are different ideas about the adequate number of cases for exploratory factor analysis. Some scholars reported that at least 3–10 cases per item are needed,[21] while some others noted that a 100-case sample is clearly inadequate, a 200-case sample is relatively adequate, and a 300-case

sample is adequate.[17] As our primary item pool contained 75 items, we recruited 322 patients.

Convergent validity assessment was performed using the "Caring Behavior Inventory" (CBI).[15] Developed by Zane Wolf, CBI has 24 items that are scored on a six-point Likert-type scale from 1 ("Never") to 6 ("Always"). Hajinezhad *et al*. reported that the Cronbach's alpha of CBI was 0.98.[22]

Assessment of reliability

The reliability of ANCS was evaluated through both internal consistency and stability assessments. Internal consistency assessment was performed using the data collected from 322 patients. On the other hand, stability assessment was performed through the test–retest method, in which twenty patients were asked to complete the scale twice with a 2-week interval.

Statistical methods

The Kaiser-Meyer-Olkin test was used to determine whether the recruited sample was adequate for exploratory factor analysis. Moreover, the Bartlett's test was done to check if there was certain redundancy between the variables. An eigenvalue of >1.0 was used to determine the number of factors. Lower eigenvalues reflect that the intended factor makes smaller contribution to the explanation of the variances of the intended concept. Varimax rotation was employed to minimize the complexity of loadings for each component. Items with factor loading values of <0.4 were considered as not strong enough. Subsequently, items with factor loadings >0.4 were loaded on the factor which had the highest factor loading.[23] Intraclass and Pearson correlation coefficients as well as regression analysis were used for both convergent validity and stability assessments. Also, Cronbach's alpha value was calculated for internal consistency assessment. In addition, the floor and the ceiling effects were examined to determine the percentages of patients with the lowest and the highest scores, respectively. Floor and ceiling effects of >20% are considered as significant and show that the intended scale is unable to accurately assess the intended concept.[24] Data were analyzed using the SPSS software version 16.0 (SPSS, Inc. Chicago, Illinois, USA).

Ethical considerations

This study was approved by the Ethics Committee of Shahid Beheshti, Jundishapur, and Dezful Universities of Medical Sciences, Tehran, Ahvaz, and Dezfoul, Iran. The Approval codes were 1.86.1186, P. 8.20.D.1207, and 92D.20.56, respectively. Participants were provided with clear explanations about the purpose and the importance of the study and their personal written informed consents were obtained. They were assured of the confidentiality of their personal data and their absolute right to withdraw from the study at will.

Results

Scale development, face and content validity

The primary version of ANCS contained 75 items. The items were scored on a six-point scale from 0 ("Never") to 5 ("Always").

Based on experts' and patients' comments, several changes were made to the wording and the writing style of some items for the sake of greater clarity. Moreover, eleven items were eliminated, and thus, the number of the items was reduced to 64. Content validity assessment revealed that 25 items had a CVR of <0.5, 24 of which were deleted and one was kept due to its great importance. This item was, "Nurses volunteer to help patients." The results of CVI calculation also led to the removal of two more items due to their modified Kappa coefficients of <0.74. Finally, 38 items remained in the scale. S-CVI/Ave was calculated twice based on the comments of a fourteen-and a six-expert panel. The results revealed that S-CVI/Ave values in these two steps were 0.94 and 0.97, respectively.

Construct validity

Exploratory factor analysis revealed that the Kaiser-Meyer-Olkin statistic was 0.96 and the Bartlett's test of sphericity statistic was 66.8373 ($P < 0.001$). Four factors were extracted. The four-factor model accounted for 60.75% of the total variance of ANC. The results of rotated component matrix are presented in Table 1. Scree plot also showed a four-factor model [Figure 1]. During factor analysis, item 26 was loaded on factors 3 and 2 with factor loadings of 0.59 and 0.40, respectively. Yet, given its conceptual consistency with the factor 2, it was included in factor 2. The four extracted factors were named "admirable and compassionate commitment

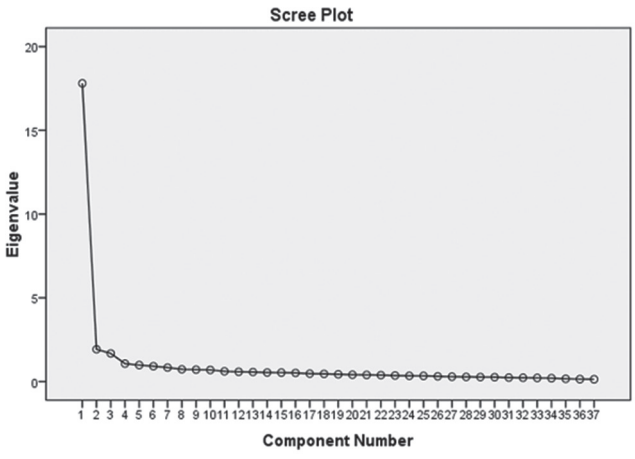

Figure 1: Scree plot

Table 1: Rotated component matrix*

Items	Component			
	Admirable and compassionate commitment and competence	Patient satisfaction and comfort	Humanistic attention to patient	Stress-free care
Nurses in this unit provide care to patients with great interest and pleasure	0.750			
They try to give the best care in accordance with patients' physical and psychological conditions	0.749			
They frequently visit patients and spend less time at the nurses station	0.747			
They are ready to sacrifice their comfort for patients	0.719			
Their patience and tolerance are beyond expectations	0.696			
I think their care provision is beautiful	0.695			
When necessary, they can be good listeners for patients	0.695			
Nurses in this unit provide care to patients as if they are their own close ones	0.694			
I enjoy their caring	0.690			
They try to pursue patients' problems until they are completely overcome	0.672			
Meeting the needs of patients is their first priority	0.671			
Their help for patients is admirable and indescribable	0.666			
They provide their care compassionately	0.656			
When necessary, they are the best guide for patients	0.633			
Patients can easily express their needs and desires to them	0.609			
In all situations, they attempt to provide patients with comfort	**0.570**	0.428		
Based on the immediate conditions and the available facilities, they provide care in the best way	0.552			
Nurses in this unit peacefully and skillfully attempt to help patients experience slighter pain during painful procedures (such as injections)	**0.488**	0.408		
Some of their care services, such as talking and listening to patients, are more effective than painkillers		0.748		
They prevent patients from experiencing despair and frustration		0.741		
They help patients feel better about themselves and their illnesses	0.430	**0.714**		
Their relationships with patients lead to happiness and smile for patients		0.699		
Their conduct during care delivery encourages patients for faster recovery	0.479	**0.644**		
They can communicate with the patients of different psychological conditions (such as elderly, depressed, and nervous patients)		**0.636**	0.423	
Their conduct causes patients to think less about their discomforts	0.493	**0.622**		
Their conduct makes hospital environment tolerable		**0.407**	0.595	

Contd...

Table 1: Contd...

Items	Component			
	Admirable and compassionate commitment and competence	Patient satisfaction and comfort	Humanistic attention to patient	Stress-free care
If they face problems during the delivery of care services (such as injections or dressing etc.), they humbly ask their colleagues for help			0.619	
The nurses of this unit are kind			0.548	
Besides providing physical care, they pay attention patients' psychological state	0.429		**0.537**	
They volunteer to help patients	0.449		**0.523**	
They show patients their humanly affection and feelings in their words and behavior			0.511	
While providing care to patients, nurses in this unit pay attention to patients' religious beliefs			0.509	
They respect the cultural traditions and rituals of patients	0.423		**0.496**	
The importance of human health is quite evident in their conduct	0.413		**0.439**	
Their conduct during care delivery causes patient suffering and annoyance				0.789
They react to patient aggression negatively and sharply				0.787
The memories of their care are unpleasant for me				0.780
They do not discriminate among patients				0.456

*Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization

and competence," "patient satisfaction and comfort," "humanistic attention to patient," and "stress-free care." The initial eigenvalues as well as total and cumulative variances explained by the factors are presented in Table 2. There was no significant floor effect and all ANCS items had been responded. Also, except for the stress-free care factor, the ceiling effect of all other factors was insignificant. The scores of the factors as well as ceiling and floor effects are shown in Table 3.

Convergent validity

Pearson correlation coefficient between the scores of ANCS and CBI was 0.84 ($P < 0.001$). Moreover, intraclass correlation coefficient was 0.85 (95% confidence interval: 75.3–90.7; $P < 0.001$). Regression analysis also yielded an R^2 of 0.7 ($P < 0.001$), implying that 70% of total ANCS score can be predicted using CBI scores [Figure 2].

Reliability

Cronbach's alpha values of ANCS and its four dimensions are shown in Table 3. Although the minimum acceptable factor loading was 0.4, one of the items (i.e., item 38) with a factor loading of 0.456 was eliminated because it reduced the Cronbach's alpha of the fourth dimension to <0.7. Stability assessment using the test–retest method also yielded a Pearson and an intraclass correlation coefficient of 0.91 and 0.93 (95% confidence interval: 83.2–97.5; $P < 0.001$), respectively.

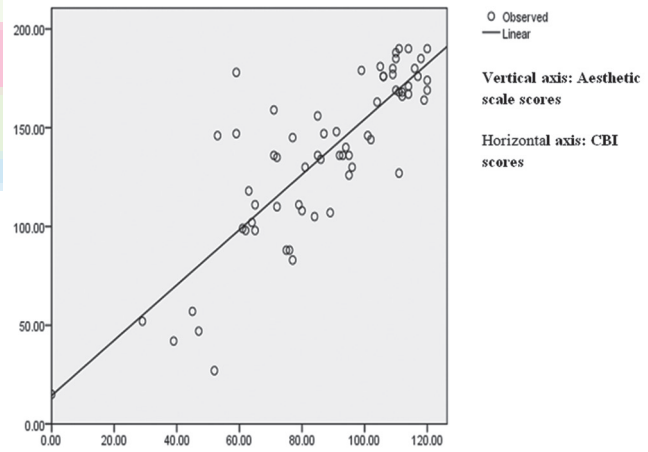

Figure 2: Regression analysis of the scores of Esthetics of Nursing Care Scale and Caring Behavior Inventory

Discussion

This study aimed at developing and evaluating the psychometric properties of ANCS. The meaning of ANC is largely dependent on the immediate culture. Thus, we extracted all 75 items of the primary ANCS from nurses' and patients' lived experiences explored in a qualitative study. Then, the number of items was reduced to 38 during face and content validity assessments. Content validity assesses the extent to which the items are related to the intended construct.[25] For greater certainty and precision, we assessed content

Table 2: Total variance explained (extraction method: Principal component analysis)

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	Percentage of variance	Cumulative (%)	Total	Percentage of variance	Cumulative (%)	Total	Percentage of variance	Cumulative (%)
1	17.805	48.122	48.122	17.805	48.122	48.122	10.198	27.563	27.563
2	1.924	5.201	53.323	1.924	5.201	53.323	5.634	15.226	42.789
3	1.677	4.533	57.856	1.677	4.533	57.856	4.497	12.155	54.945
4	1.071	2.895	60.752	1.071	2.895	60.752	2.149	5.807	60.752

Table 3: The score and the Cronbach's alpha values of Esthetics of Nursing Care Scale dimensions

Dimensions	Mean score[a]	Maximum score	Ceiling effect (%)	Floor effect (%)	Cronbach's alpha
Admirable and compassionate commitment and competence	3.69 ± 1.18	5	11.5	0.6	0.95
Patient satisfaction and comfort	3.61 ± 1.28	5	16.1	2.2	0.91
Humanistic attention to patient	3.73 ± 1.08	5	11.5	0.3	0.86
Stress-free care	3.48 ± 1.43	5	23.5	4.7	0.72
Total	3.66 ± 1.18	5	2.5	0.3	0.96

[a]Higher scores indicate higher esthetics of nursing care

validity through measuring CVI twice. High levels of SI-CVIs in both stages and also the removal of only one item during internal consistency assessment can reflect the soundness and the precision of the processes of item and scale development and face and content validity assessments. Assessment of participants' demographic characteristics showed that they were of different gender and age groups and their professional and educational status was relatively as similar as the status of patients who are hospitalized in public hospitals.

The first and the most basic dimension of ANCS is "admirable and compassionate commitment and competence." This dimension refers to nurses' ability to provide skillful nursing care which is one of the first definitions of the "art of nursing."[3] One of caring measurement tools is the "Caring Professional Scale" (CPS), the theoretical framework of which is "Swanson's Theory of Caring." CPS has two main subscales, namely, "compassionate healer" and "competent caregiver," and several categories. The CPS categories of knowledge, skill, commitment, and accountability are similar to the items of the first dimension of our ANCS, i.e., "admirable and compassionate commitment and competence."

The second ANCS dimension is "patient satisfaction and comfort." Similarly, the "Caring Nurse-Patient Interactions Scale" – a valid and widely-used ten-subscale tool designed based on Watson's Theory of Human Caring – also contains satisfaction-and comfort-related subscales such as hope, patient advocacy, and sensitivity to patients.[26] In general, nursing means ensuring client's mental satisfaction and happiness and helping people improve their quality of life.[13]

"Humanistic attention to patients" is the third ANCS dimension. Michales believes that even in the simplest parts of their daily nursing practice, nurses need to be able to show humanistic behaviors.[1] This aspect of nursing care is in fact a deep sense and understanding about others. Most caring measurement tools, such as "Nurse-Patient Relationship Questionnaire" and "Caring Factor Survey," also incorporate the same concept.[15]

At the beginning of the study, we were concerned about the possible similarities between ANCS items and the items of other caring measurement tools. However, the results of the present study showed that although some ANCS dimensions were in some ways similar to the dimensions of other care assessment instruments – especially those designed based on the Theory of Human Care and Swanson's Communication Theory – around 80% of ANCS items were not similar to the items of other instruments. This finding confirms that ANCS can specifically assess the esthetic aspects of nursing care.

Ceiling and floor effects were not significant for almost all ANCS dimensions, confirming the appropriateness of the instrument. The significant ceiling effect of the "stress-free care" dimension can be caused by the negative wording of all its items.

We assessed the convergent validity of ANCS using CBI. Pearson and intraclass correlation coefficients between the scores of ANCS and CBI were, respectively, 0.84 and 0.85, denoting the great convergent validity of ANCS.[17] Moreover, this strong correlation shows that both instruments measure the same construct.

Study findings also showed that ANCS has good internal consistency and stability. These findings suggest the high reliability of the scale. High stability of an instrument increases the power and the reliability of studies which use it.[26]

Some factors might have affected our participants' responses to ANCS. For instance, as our participants needed to use ANCS for rating those nurses who provided care to them, they might have thought that their responses could affect the quality of care services provided to them by nurses. Of course, we attempted to minimize the effects of this confounder through adequately informing patients about the purpose of the study and asking them to complete the scale on the last day of their hospitalization. To eliminate the effects of this confounder, future studies are recommended to use the scale after hospital discharge. The next limitation was that some patients were reluctant to complete ANCS because they believed that it contained too many questions.

ANCS aims to evaluate ANC based on patients' direct observations and understanding of nurses' practice. Thus, a six-point Likert-type scale was used for responding its items from "Never" to "Always." However, considering the three items of "I think they provide care beautifully," "I enjoy their caring," and "Their help for patients is admirable and indescribable," some scholars believed that attitudinal scoring scale is more suitable for rating these items because attitudinal scoring scale measures people's opinions and understanding using choices which range from "Completely agree" to "Completely disagree." Contrarily, some other scholars believed that both behavioral and attitudinal scales can be used for the scoring of ANCS items because care and behavior can be observed and evaluated in a same way.

Conclusion

The results of this study indicate that ANCS has a high and acceptable validity and reliability. The final version of ANCS contains 38 items and can be completely filled out in 10–12 min. Given its acceptable validity, reliability, and simplicity, ANCS can be employed as an appropriate instrument for the evaluation of ANC and nursing care quality from patients' perspectives. Operationalizing the concept of ANC in the present study through developing different items for measuring its different aspects can facilitate the integration of the concept into nursing curriculum. Educational programs on ANC would familiarize nursing students with esthetics knowledge as well as the art and philosophy of nursing care.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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