

DOI: 10.5455/msm.2021.33.34-40

Received: FEB 02 2021; Accepted: MAR 10, 2021

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## ORIGINAL PAPER

Mater Sociomed. 2021 Mar; 33(1): 34-40

# Translation, Cultural Adaptation, Validation and Internal Consistency of the Factors of Nurses Caring Behavior

Victoria Alikari<sup>1</sup>, Evangelos C. Fradelos<sup>2</sup>, Natalia Giannakopoulou<sup>3</sup>, Georgia Gerogianni<sup>4</sup>, Flora Efstathiou<sup>5</sup>, Maria Lavdaniti<sup>6</sup>, Sofia Zyga<sup>1</sup>

<sup>1</sup>Nursing Research and Practice Laboratory, Department of Nursing, Faculty of Human Movement and Quality of Life Sciences, University of Peloponnese, Tripolis, Greece

<sup>2</sup>Department of Nursing, University of Thessaly, Larisa, Greece

<sup>3</sup>Internal Medicine Department, Attiko Hospital, Athens, Greece

<sup>4</sup>Department of Nursing, University of West Attica, Athens, Greece

<sup>5</sup>Operating Room Department, "G. Gennimatas" General Hospital, Athens, Greece

<sup>6</sup>Research Laboratory "Care in Adult Cancer Patients", Department of Nursing, International Hellenic University, Thessaloniki, Greece.

**Corresponding author:** Victoria Alikari, Post-Doctoral Research, Nursing Research and Practice Laboratory Department of Nursing, Faculty of Human Movement and Quality of Life Sciences, University of Peloponnese. Address: Sehi Area, Tripolis, 2100, Greece. Phone: +30 6936168825. E-mail address: vicalikari@gmail.com. ORCID ID: <https://orcid.org/0000-0003-1733-6208>,

## ABSTRACT

**Introduction:** The international literature presents a significant gap in the study of the factors affecting caring behaviors as perceived by nurses. This gap requires the study of the factors of nurses' caring behavior. **Aim:** The translation and the cultural adaptation of the Factors of Nurses Caring Behaviors (FNCB) scale in the Greek language, the validity, and internal consistency of the scale. **Methods:** Between November-December 2019, 329 Greek nurses from six public general hospitals completed the FNCB scale consisting of 32 items rating on a 5-point Likert scale. The scale was firstly translated in the Greek language, then back-translated in the English language and culturally adapted. To investigate the construct validity of the scale, exploratory factor analysis was carried out with principal component analysis. The test-retest reliability was performed while the internal consistency was checked through Cronbach's alpha coefficient. Statistical analysis was performed via the Statistical Program SPSS version 21.0. The statistical significance level was set up at 0.05. **Results:** The final Greek version of the FNCB Scale includes six factors which were revealed from the exploratory factor analysis: Workplace Circumstances, Workload/Management, Interest/Perceptions on Nursing Job, Nurse's Educational Background, Patient's Demographic Characteristics, and Patient's Clinical Characteristics. The internal consistency of the scale was excellent (Cronbach's alpha 0.95). **Conclusions:** The Greek version of the FNCB Scale is a valid and reliable questionnaire which can be used for the measure of factors affecting nurses' caring behavior.

**Keywords:** caring behaviors, caring, translation, construct validity, reliability.

## 1. INTRODUCTION

From the time of Florence Nightingale, the concept of nursing is connected with the concept of care and is considered as the most important feature and the core of nursing science. Nurses convey care and transmit the feeling of "caring" through the practical application of caring behaviors, ie operations, contact but also through the special relationship with patients (1). Through the practice of nursing, the nature of care in nursing emerges, as a way of life, beliefs, values but also as applied actions-procedures, and is expressed through caring behaviors (2). For this reason, the nature of caring is twofold. On the one hand, the concept of care consists of technical skills and physical behaviors, and on the other hand, it consists of psychological and emotional behaviors such as hope, confidence, and dignity (3).

### *Caring behaviors*

Nursing caring behaviors are characterized by an interest in the patient's well-being and relief and include actions such as careful listening, honesty, and non-judgmental acceptance (4). The way each nurse will act depends on many factors and will probably have a completely different result. Therefore, a particularly important issue is the factors that may affect nurses' caring behaviors (5). Watson suggests 10 caring factors which, combined with scientific knowledge and clinical skills, guide nurses in health promotion, disease prevention, and health recovery. These include the humanitarian and altruistic value system, building a relationship of trust, strengthening people's faith and hope in themselves, expressing feelings, and maintaining a supportive and protective

environment to promote harmony and well-being. The above factors constitute the system of humanitarian values, arising through the philosophy of humanity which is the central concept in care (6,7).

Before specific caring behaviors emerge, an internal process in each nurse has preceded where personal ideas, values, and beliefs have been combined with his or her educational background and technical skills. The nursing care provided is determined by the way and expression of specific behaviors, by the way a nurse uses his *knowledge* and appreciates the patient's uniqueness both physically and emotionally to help him manage the disease (8). The majority of nurses state that patient care requires the involvement of the nurse as a person and point out the influence of the nurse's personality and personal values in providing care and creating a therapeutic relationship with the patient (9). In addition, according to a study (10), the way nurses care for patients is influenced by their personal experiences and beliefs. Emotional intelligence seems to have an important effect on caring behaviors while nurses' demographic characteristics did not affect caring behaviors (11). Also, major factors of nurses' caring behaviors are the educational background and nurse's characteristics (3,12).

However, the caring behavior depends not only on the personality of the nurse but, also, on the work-environment, as well as the working conditions that prevail, the support from the working environment, and the relationship that develops between the nurse and the patient (3,12). Nurses in day-care chemotherapy and radiotherapy clinics report that due to the limited time, they focus on mechanical care delivery while ignoring meaningful communication and personalized patient information (13,14). Other studies (3,15,16) revealed that job satisfaction, the interaction between nurses, and the understaffing of nurses may affect negatively the caring behaviors. The different cultural-religious backgrounds of patients and nurses, the intensively medical-centered education of nurses, the social context that allows or prevents specific behaviors and expressions create a gap between what nurses consider to be good care and what actually applies to daily clinical practice (17,18).

#### *Measures of caring behaviors*

Based on the above, the focus of nursing research is on an effort to understand the caring behaviors and the factors which determine it. In the early 1970s, interest in the study of care led nurses to explore it by self-administered tools that described the caring behaviors. The most commonly used questionnaires to measure the dimensions of care are the Caring Ability Inventory (19), the Caring Behavior Inventory (CBI-24) (20), the Caring Behavior Assessment Tool (CBA) (21), and the Caring Dimension Inventory (CDI) (22). In Greece, a first attempt to study caring behaviors was made through the dissertation of Professor Lanara (1977) (23) while more studies began to be conducted in 2010 (24,25).

However, all the above researchers study either the dimensions of caring behaviors or the nurses' perceptions on caring behaviors. Globally, only two scales measure the factors that may affect nurses' caring behaviors: The Determinants of Nurses' Caring Behaviors (12) was constructed in 2013 in Iran and it consists of 38 items and the Factors of

Nurses Caring Behaviors (FNCB) (26) was constructed in 2018 in Egypt. The reason that researchers chose the second one is that it is shorter and more comprehensive. Given the gap in the literature on the factors that may influence caring behaviors, the purpose of this study was the translation in the Greek language, cultural adaptation, and validation of the FNCB Scale for Greek nurses. This study is the first attempt to adapt a scale measuring the determinants of caring behaviors not only in Greece but internationally.

## 2. AIM

The translation and the cultural adaptation of the Factors of Nurses Caring Behaviors (FNCB) scale in the Greek language, the validity, and internal consistency of the scale..

## 3. METHODS

### *Design and sample*

A descriptive, cross-sectional study was performed with a sample of nurses from six public general hospitals in the broad area of Attica (Athens and Piraeus regions), Thessaloniki, (the most populated regions in Greece), and Peloponnese (Korinthos, Kyparissia, and Kalamata counties). The study was carried out during the period November–December 2019. The questionnaires were randomly distributed to 379 nurses of the hospitals. Of these, 329 completed the questionnaires (response rate of 86.8%). The decision of the final sample size was based on the literature (27) according to which the number of subjects depends on the number of the items (10 subjects per item). Therefore, the number of 329 subjects is considered to be an appropriate number of participants. The inclusion criteria were: (i) be nurses or assistant nurses for at least 1 year, (ii) ability to write and speak the Greek language fluently. Students of nursing schools were excluded from the study.

### *The instrument*

*The Factors of Nurses Caring Behaviors Scale (FNCB).* The FNCB scale was developed in 2018 (26) to assess the factors affecting nurses' caring behaviors. It is a self-completed questionnaire which consists of 32 states rated on a 5-point Likert scale (1=totally do not affect to 5=completely affect) and 4 dimensions of factors of nurses' caring behavior: (i) workplace circumstances (14 items, rating 14-70), (ii) workload, general interest for the nursing profession and job satisfaction (6 items, rating 6-30), (iii) nurses' educational background (4 items, rating 4-20) and (iv) patient characteristics (8 items, rating 8-40). The total score can range between 32- 160 and is extracting by the sum of all the items. The higher the score, the higher the effect of each factor on the nurses' caring behavior. It has been used in a study (26) among critical care nurses with excellent reliability (Cronbach's alpha 0.93). The scale has not been used in other studies.

The procedure included the following phases:

- The translation and cultural adaptation of the FNCB Scale.
- The investigation of the reliability, validation, and internal consistency of the FNCB Scale.

### *Phase 1: The translation procedure*

The translation process was carried out according to the World Health Organization (WHO) guidelines (28).

The *first step* involved the independent translation of the original English version of the questionnaire (Forward Translation) by two different nurses into the Greek language (target language). Both nurses had Greek as their native language, they could speak the English language excellent and knowledgeable of the English culture. The two Greek versions were then compared by a panel of experts (a bilingual nurse and the lead researcher of this study) who evaluated and came up with a different preliminary Greek version to produce the first Reconciliation Version.

Subsequently, the *second step* was followed. The first reconciliation version was translated into the original language (Backward Translation), ie into English, by two other independent translators who were bilingual without, however, knowing the original version. The two-resulting back-translated Greek versions were obtained.

In the *third step*, the two back-translated Greek versions were compared by the lead researcher who came up with a new version. This version was sent to the creators for approval and comments. The manufacturers' comments were incorporated giving a second version of the questionnaire in Greek (Second Reconciliation Version).

#### *Phase 2: The cultural adaptation procedure*

The cultural adaptation involved the administration of the Second Reconciliation Version to 15 nurses (convenience sample) to determine if the content was comprehensible. According to the WHO (28), the minimum number of participants for the cultural adaptation of a questionnaire is 10. The cognitive review process was applied: the nurses completed the questionnaire and the researcher asked the respondents if there were difficult or unclear points. If so, nurses, after given time for thinking and expressing doubts, were asked to suggest alternative wording (Cognitive Debriefing Review). Their suggestions were incorporated into the second reconciliation version of the questionnaire and, as a result, the final Greek version was created. The nurses then responded to a General Impressions Tool which involved the following questions: (i) What is your general opinion about the questionnaire? (Good/No good), (ii) Are the questions understandable? (Yes/No), (iii) Do you think that the questions are important? (Yes/No), (iv) Did you have difficulties with the categories of answers? (Yes/No). A percent of 90% answered that the questionnaire is good, understandable and the questions are important while only 15% had difficulties with the categories of the answers.

#### *Reliability*

From the sample of 329, 50 nurses completed the questionnaire for second time after a period of two weeks to test the reliability. A period of two weeks elapsed between the first and second completion which assures that participants will not remember the answers of the first completion (29).

#### *Data analysis*

Quantitative variables were described with the mean values and standard deviations while qualitative variables were described with the absolute (N) and relative (%) frequencies. The reliability of the FNCB Scale was tested through the test-retest method. In order to control the repeatability between the 1<sup>st</sup> and the 2<sup>nd</sup> completion, the Pearson's correlation coefficient, the Intraclass Correlation

Demographic data	Frequency	Percentage (%)
Gender		
Female	251	76.3
Male	71	21.6
Educational status		
High School	71	21.6
University	201	61.1
MSc / P.h. D	53	16.1
Marital status		
Married	190	28%
Unmarried	92	28
Divorced	29	8.8
Widowed	9	2.7
Working department		
Internal Medicine Sector	130	39.5
Surgical Sector	113	34.3
Intensive Care Unit	22	6.7
Emergency Department	26	7.9
Operating Theatre	26	7.9
Other	7	2.1
Working position		
Nurse Assistant	72	21.9
Nurse	229	69.6
Head Nurse	20	6.1
Section Manager	3	0.9
Number of beds in the nursing department		
≤10	54	16.4
11 – 20	110	33.4
21 – 30	103	31.3
≥ 30	29	8.8
<b>Number of beds in ICU</b> (only for those working in ICU)		
3-5	21	95.4
Shift		
Only morning	70	21.3
Only Afternoon	7	2.1
Only night	3	0.9
Rotated	241	73.3
Nights per month		
≤ 3	86	26.1
4-6	119	36.2
7-9	40	12.2
≥ 10	7	2.1
Not working at night shift	77	23.4
	Mean (SD)	Min-Max
Age (years)	46 (8.89)	21-62
Total working experience as a nurse (years)	17.6 (8.5)	1-36
ICU: Intensive Care Unit, SD: Standard Deviation		

Table 1. Participant demographics (N=329)

Coefficient (ICC) were used while the paired t-test was used to assess the differences between the two completions. The Cronbach's alpha coefficient was used to test the internal consistency of the Greek version of the FNCB Scale. The acceptable values of Cronbach's alpha are 0.70-0.90 (30). Exploratory factor analysis was performed to investigate the construct validity of the scale. In particular, the factor analysis technique was applied with the axis rotation method: Varimax with Kaiser normalization. Through the correlation between the FNCB factors, the convergent validity was tested. It was hypothesized that a positive significant correlation will be found between the FNCB factors (31). The correlation is considered low when the correlation coefficient ( $r$ ) ranges from 0.1 to 0.3, moderate when the correlation coefficient ranges from 0.31 to 0.5, and high when the coefficient is greater than 0.5. For the data analysis, the IBM SPSS Statistics 21 was used while the statistical significance was set up at the level of 5%.

#### Ethics

To carry out the study, licenses were secured from the Scientific Councils of the Hospitals: (i) General Hospital of Athens G. Gennimatas (41432/27.12.2018), General Hospital of Nikaia "Ag. Panteleimon" (54493/25.11.2019), General Hospital of Thessaloniki "Papanikolaou" (345/23.9.2019), General Hospital of Messenia (Kalamata) (16/31.10.2019), General Hospital of Kyparissia (4581/9.10.2019), General Hospital of Korinthos (45/25.10.2019). Nurses were informed by the researchers about the aim of the study, the voluntary participation, the anonymity of the data, and that they can withdraw from the study if they want. Nurses signed a written consent form.

## 4. RESULTS

The nurses' age ranged between 21 and 62 years (Mean:46) while 76.3% were female. The majority (39.5%) worked in the Internal Medicine Sector. The mean of working experience as nurses was 17.6 years (Table 1).

#### Construct validity

Exploratory factor analysis was performed to investigate the construct validity of the scale. In particular, the method of axis rotation (Varimax with Kaiser normalization) was used. The exploratory factor analysis shows whether the correlation between the questions can be explained by a smaller number of factors. The value of the Kaiser-Meyer-Olkin Index for sampling adequacy (0.927) and Bartlett's Test of Sphericity ( $\chi^2(496) = 6827.378, p < 0.001$ ) showed that there is sampling adequacy and therefore,

factor analysis will reveal competent results. Six factors were revealed from the factor analysis which explains the 71.419% of the total variance (Criterion Kaiser, Eigenvalue  $> 1$ ). The scree plot is presented in figure 1. In addition, all factor loading queries had values  $> 0.40$  which is the acceptable limit (32).

The factors extracted were identified as follows: (i) Workplace circumstances (It ems' 1-8 loadings from 0.421-0.708), (ii) Workload/ Management (It ems' 9-15 loadings from 0.499-0.886), (iii) Interest / Perceptions on Nursing Job (It ems' 16-20 loadings from 0.612-0.752), (iv) Nurse's Educational Background (It ems' 21-24 loadings from 0.491-0.823), (v) Patient's Demographic Characteristics (It ems' 25-28 loadings from 0.776-0.860), and (vi) Patient's Clinical Characteristics (It ems' 29-32 loadings from 0.745-0.873).

#### Convergent validity

To conduct the convergent validity, the correlation coefficient  $r$  was used between the factors of the FNCB Scale. As it is shown, there is a positive relationship between the factors (dimensions) of the scale ( $r = 0.761$  the highest and 0.3 the lowest value,  $p < 0.001$ ) (Table 2).

#### Reliability

The correlation between the first and the second measurement, in total scale rating, in partial sums of the subcategories as well as at the level of each item ( $r$ -values from 0.69-0.91,  $p < 0.001$ ) separately shows a strong correlation between the two measurements. As far as Paired t-test is concerned,  $t$ -values between the two measurements in total score ( $t = -0.43, p > 0.05$ ), in partial sums of subcategories (Workplace Circumstances  $t = 0.88, p > 0.05$ , Workload/Management,  $t = -0.41, p > 0.05$ , Interest/Perceptions on Nursing Job,  $t = -0.55, p > 0.05$ , Nurse's Educational Background,  $t = 0.89, p > 0.05$ , Patient's Demographic Characteristics,  $t = 0.89, p > 0.05$ , Patient's Clinical characteristics,  $t = 0.89, p > 0.05$ ) and in each item ( $t$ -value from -0.41 to 1.4,  $p > 0.05$ ) didn't reveal any statistical significance. The ICC coefficient revealed an excellent correlation between the two measurements (ICC= 0.991,  $p < 0.001$ ) (Table 3).

#### Internal consistency

The Cronbach's alpha coefficient was used to test the internal consistency of the Greek version of the FNCB Scale. The total Cronbach's alpha coefficient of the scale was found to be 0.95 which means that the scale has excellent internal consistency. Regarding the internal consistency of each factor, the results were rated between 0.82 - 0.95. All values of Cronbach's alpha in both the overall scale and the subscales were  $> 0.8$  which means that the scale has very

	1	2	3	4	5	6
Workplace Circumstances						
Workload/ Management	0.761**					
Interest/ Perceptions on Nursing Job	0.711**	0.631**				
Nurse's Educational Background	0.557**	0.499**	0.592**			
Patient's Demographic Characteristics	0.577**	0.377**	0.500**	0.555**		
Patient's Clinical Characteristics	0.385**	0.3**	0.369**	0.342**	0.534**	

\*\* $p < 0.001$

Table 2. Correlation between factors of FNCB Scale

FNCB Scale	Test (1 <sup>st</sup> ) Mean (SD)	Test (2 <sup>nd</sup> ) Mean (SD)	Pearson's r Correlation	Paired t-test	ICC
Work Place Circumstances	24.49 (7.7)	24.31 (6.87)	0.89*	0.88**	0.98*
Workload / Management	24.5 (6.7)	24.44 (95.54)	0.84*	-0.41**	0.97*
Interest / Perceptions on Nursing Job	16.92 (4.8)	16.91 (3.5)	0.87*	-0.55**	0.97*
Nurse's Educational Background	13.09 (3.8)	12.98 (2.4)	0.87*	0.89**	0.98*
Patient's Demographic Characteristics	11.61 (5.3)	11.52 (6.4)	0.88*	0.89**	0.97*
Patient's Clinical Characteristics	10.02 (3.1)	10.16 (3.)	0.83*	0.89**	0.97*
Total	100.63 (25.61)	100.32 (24.38)	0.934*	-0.43**	0.98*

\* $p < 0.001$ ,  $p > 0.05$ \*\*, SD: Standard Deviation, ICC: Intraclass Correlation Coefficient

Table 3. Test-retest reliability of FNCB scale (n=50, two weeks period between the two measurements).

FNCB Scale	Mean (SD)	Min-Max	Cronbach's alpha
Workplace circumstances	24.45 (7.97)	2.65 -3.65	0.91
Workload/Management	24.5 (6.35)	3.09-3.86	0.89
Interest / Perceptions on Nursing Job	16.53 (5.06)	3.15-3.55	0.88
Nurse's Educational Background	12.67 (4.42)	2.97-3.27	0.82
Patient's Demographic Characteristics	11.62 (5.48)	2.03-2.51	0.91
Patient's Clinical Characteristics	10.05 (3.5)	3.22-3.53	0.85
Total	100.50 (25.6)	2.05-3.91	0.95

SD: Standard Deviation

Table 4. Internal consistency of FNCB Scale (N= 329)

good internal consistency. Also, no significant increase in Cronbach's alpha would occur if an item was deleted, which means that all queries had significant internal coherence with each other. The following table (Table 4) gives the results of internal consistency, the total mean score, and the scores of the dimensions. Higher scores indicate a higher effect of each dimension in caring behaviors. The dimensions of "Workplace Circumstances", "Workload/Management", "Interest / Perceptions on Nursing Job" received higher scores than the rests.

## 5. DISCUSSION

This study was carried out in six Greek hospitals and targeted to assess the validity and reliability of the Greek version of the FNCB Scale. The FNCB scale is used for the first time among Greek nurses. The challenge for nursing managers is important as the knowledge of the real factors affecting nurses' caring behavior may contribute to the improvement of quality of care (33).

This study showed that the FNCB Scale is a reliable and validated scale appropriate to measure nurses' caring behaviors. Several studies have been carried out related to the nurses' caring behaviors. Most of them investigate the effect of particular determinants on nurses' caring behaviors or the correlation. In particular, studies use questionnaires for each variable separately such as job satisfaction (34), interaction with colleagues and patients (35), work environment (36). For this reason, there was a need to fill the gap in the literature by constructing a scale

that includes the majority of the factors that affect the nurses' caring behaviors.

### Translation and cultural adaptation

The Greek version of the FNCB Scale was considered to be appropriate, understandable, and accepted by nurses who participated in the study. The process of translating and culturally adapting a questionnaire requires not only the literal translation but also the preservation of the cultural elements of the people for whom the tool is intended. In this context, in order to achieve a better quality of translation, the forward and backward translation process was followed. The strategy of using a team of expert nurses helped to identify the difficult points and the translated version. The 2<sup>nd</sup> reconciliation version emerged through an agreement between the discrepancies and the doubtful points found in the two translations.

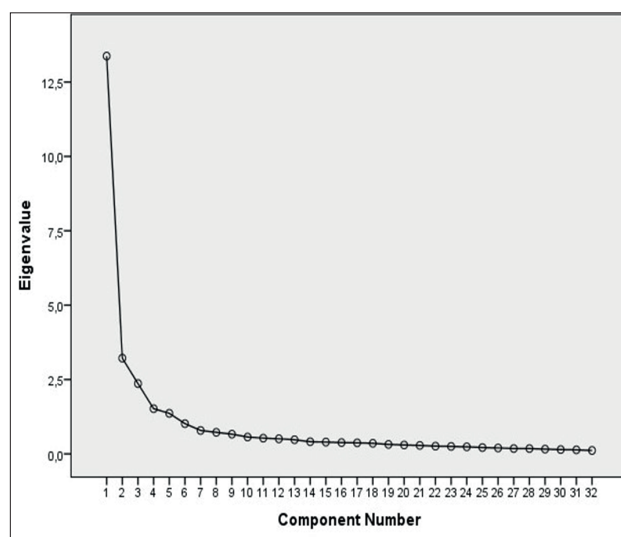


Figure 1. Scree Plot for 32-item FNCB Scale.

The nurses, also, answered that the final version of the tool was comprehensible, evaluating the cultural equivalence. In fact, there was no particular point that caused difficulty in the cultural adaptation of the scale although the scale comes from a country (Egypt) with many cultural differences from Greece.

### Reliability, internal consistency

Moreover, the results of this study suggest that the Greek version of the FNCB scale is a reliable scale to measure the factors affecting nurses' caring behaviors. The total Cronbach's coefficient of the Greek version of the

FNCB scale was found to be 0.95 while the subscales are rated between 0.82-0.95. The resulted Cronbach's coefficient is higher compared to the original version (0.93) (26) which indicates the excellent internal consistency of the Greek version. Also, it should be highlighted that all items are considerable for the internal consistency of the scale as the removal of a question would cause a reduction in Cronbach's alpha. The test of repeatability was performed to confirm the stability of the scale. No significant differences in ICC, Pearson correlation test or paired t-test have existed between the two measurements which indicate the reliability of the scale (37).

#### Validation

Exploratory factor analysis revealed six factors that explain 71.419% of the total variance. These results are similar with those of the previous study exploring the validity of the Egyptian version (26). The original version of the scale revealed four dimensions while the Greek version six dimensions. The dimensions which were resulted in this study were "Workplace circumstances" (items 1-8), "Workload / Management" (items 9-15), "Interest/ Perceptions on Nursing Job" (items 16-20), "Nurse's Educational Background" (items 21-24), "Patient's Demographic Characteristics" (items 25-28), and "Patient's Clinical Characteristics" (items 29-32). Although the dimensions of the Greek version are conceptually similar to those of the Egyptian version, there are some differences which should be discussed. While in the Egyptian version the first 14 questions belong to the factor "Working Circumstances", in the Greek version these questions were charged in two separate dimensions (1<sup>st</sup> "Working Circumstances" and 2<sup>nd</sup> "Workload / Management") while in the second dimension the 15th question ("My caring behavior would be affected by the workload and lack of enough time") was charged. Similarly with the original Egyptian version (26), the items 16-20 and 21-24 were charged in the third factor and fourth factors respectively. Regarding the characteristics of the patient, two subcategories emerged from the Greek version ("Patient's Demographic Characteristics" and "Patient's Clinical Characteristics") while in the original version they were charged with one factor (Patient's Characteristics). Several reviews and qualitative studies have revealed conceptually similar dimensions such as lack of staff, workload, patient's, and nurses' characteristics (33,38,39). Convergent validity was tested through the correlation between the dimensions revealed. The positive relationship between the dimensions supports the convergent validity of the Greek version of the scale.

This study has two strengths; it is the first study that tries to weigh such a scale, not only in Greece but in Europe in general. Second, the sample of nurses comes from hospitals located throughout Greece. Therefore, we can consider that the results of this study can be generalized. As far as the limitations are concerned, it should be noted that the questionnaires were completed during the nurses' shift. Consequently, the prevailing working conditions (presence of other colleagues, patient calls) may have affected the objectivity of the responses.

## 6. CONCLUSION

The Greek version of the FNCB Scale is a valid, easy, and reliable tool for assessing Greek nurses' caring behaviors as it is characterized by excellent psychometric properties. The findings of this study enable future research to focus on the study of nurses' caring behaviors in conjunction with the factors that may influence.

- **Patient Consent Form:** All participants were informed about subject of the study.
- **Author's Contribution:** V.A. and S.Z gave substantial contributions to the conception and design of the work, in acquisition, analysis, and interpretation of data for the work. E.F gave substantial contributions to data analysis. F.E., G.G. M.L. and N.G. gave substantial contributions to data acquisition. V.A. had a major part in article preparing. V.A. and S.Z. drafted the article and revised it critically for important intellectual content. All authors gave the final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to accuracy or integrity of any part of the work are appropriately investigated and resolved.
- **Conflicts of interest:** There are no conflicts of interest.
- **Financial support and sponsorship:** None.

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