

Pediatric Version of the Nurse Caring Behavior Scale: Cross-Sectional Study in Pediatric Hemato-Oncology Centers

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The nursing concept of caring has been thoroughly studied over the last decades (Finfgeld-Connett, 2008; Watson, 2012; Smith et al., 2013). To date, it is considered an essential nursing value (Duffy, 2018; Turkel et al., 2018; Gierach et al., 2019). Caring is in fact a way through which nurses relate with others, it is a way of being a nurse (Watson, 2009; Fenizia et al., 2019).

Finfgeld-Connett's qualitative caring meta-synthesis study shows that caring as an "interpersonal process" has positive effects on both patients and nurses (2008). These positive effects relate to the patients' increased physical and mental well-being and diminished stress, while nurses enjoy a higher degree of accomplishment as individuals and healthcare professionals. Moreover, in this "interpersonal process" close relationships are marked by feelings of protection and trust concerning also the patients' family and partners (Finfgeld-Connett, 2008).

In this context, the nurse takes care of the patient working in order to harmonize the dimension of being with the dimension of doing (Swanson, 1993; Fenizia et al., 2020): The nurses' behavior shows that they are capable of tailoring their attention to the needs of each patient through respect, support and understanding which also helps preserve their dignity (Watson, 1985, 2012). Such behaviors have been defined as caring behaviors, which, in turn, constitute an observable indicator of the the wider dimension of caring itself. It's therefore clear that caring behaviors constitute healthcare quality indicators (Edvardsson et al., 2017).

"In particular, patient perceptions of nurse caring behaviours have been significantly associated with and account for more than half of the total variance of nursing care quality and are one of the best predictors of overall satisfaction with the care received in hospitals" (Piredda et al., 2017).

Several tools can measure caring in nursing practice both from the patients and the nurses' perspectives, and are used in different clinical and academic contexts. (Sitzman & Watson, 2019; Papastavrou, Efstathiou, & Charalambous, 2011).

In this paper we will verify the reliability of an already validated nursing caring scale for adults in the clinical context of pediatric onco-hematology.

AQ4 **Background and Conceptual Framework**

Caring is a set of activities that include all the interactions devoted to looking after individuals that need care, particularly people that are ill or children. Caring is inclusive; it involves the family and the community (Enzman Hines & Gaughan, 2017; Duffy, 2018; Holopainen et al., 2019). In particular, caring is a set of behaviors that produce an environment characterized by cohesion and coordination among colleagues and attention to the needs of patients (Watson J., 2008). It increases the well-being of both patients and caregivers (Watson, 2009). In this perspective, it appears that caring is all about showing kindness and concern for others.

Nurses in the workplace frequently face many stressful situations, such as when they have to work with children affected by severe diseases, which frequently lead to the nurses experiencing physical exhaustion and burn-out (Busch et al., 2019). Taking this into account, the value of caring is greater in pediatrics and in pediatric hemato-oncology than in other areas of care.

Pediatric hospitalization affects both the child and the family. It can completely upset their daily family and social activities and take a heavy psychological and emotional toll. Age, previous experiences, fear of tests and procedures, and their understanding of the disease can all generate mood disorders in young patients. Hospitals try to minimize these effects by allowing the child to be accompanied during hospitalization and by providing support to the family throughout the process (Maslak et al., 2019; Dionne-Odom et al., 2019; Balliot et al., 2019; Mooney-Doyle & Ulrich, 2020).

One of the main supports available to these families and children is the ability to interact with their paediatric nurses which helps protect their well-being. It is therefore important to know which elements of care can minimize the impact of pediatric cancer and ensure the best care for these children (Jones, 2012; Lövgren et al., 2016; Nadeau et al., 2017; Wilson et al., 2018).

Caring can be measured like other technical skills and types of performance (Sitzman & Watson, 2019; Fenizia et al., 2019). An evaluation of caring plays a significant role in healthcare quality (Piredda et al., 2015; Edvardsson et al., 2017).

Shank et al. (2020) conducted a wide-ranging review that evaluated the measuring tools used in pediatrics. To date however, there is no specific tool that measures caring in pediatrics (Giordano et al., 2014; Calza et al., 2015; Tanco et al., 2017; Shank et al., 2020; Lassandro et al., 2020; Bahrami et al., 2021).

Specific tests, previously developed for adult patients, have never been validated for children. Most of those tests take into account the cultural context of the place where they are implemented (Sitzman & Watson, 2019).

In Italy there are the following caring measuring tools: The Italian Caring Behaviors Inventory (CBIIta) (Tomietto et al., 2014; Fenizia et al. 2019), the Nursing Students' Perception of Instructor Caring (NSPIC) (Arrigoni et al., 2017), the CARE-Italy (Ambrosi et al., 2018), and the Italian Language Nurse Caring Behaviors Scale (NCBS) (Piredda et al., 2017).

The NCBS was selected for the present study because it is unidimensional and short, hence more suitable in a clinical setting than CBIta, NSPIC and CARE-Italy which, being multidimensional, are more suitable in the educational field (Wolf et al., 2017; Fenizia et al., 2020). Despite its brevity, the 14 items of the NCBS describe nurse caring behaviors and have a clear correspondence with the caring characteristics as in Finfgeld-Connett's (2008). It has demonstrated excellent psychometric characteristics within a large sample of adult patients (Piredda et al., 2017).

The objective of this study is to test the psychometric reliability of the adapted NCBS both for caregivers (cgNCBS) and nurses (pNCBS) in pediatric hemato-oncology units.

Methods

Study Design. This cross-sectional validation study tested the psychometrics of two novel versions of the NCBS in the pediatric hematology and oncology setting.

Participants. Nurses and caregivers from 25 centers of the Italian Association of Pediatric Hematology and Oncology were enrolled from June to December 2018. The Caregivers' inclusion criteria were: 1) having attended the child's visits during the data collection; 2) being a parent, a grandparent or a legal guardian. There was no exclusion criteria.

Ethics. The nurses and caregivers' participation was voluntary. The informed consent was implicit when the participants filled out the demographic questionnaire and the scale. Data protection was guaranteed. This study was approved by the Institutional Review Board (number 33/2018/PO), and the authorization to modify and use the scale was obtained.

Scale. The NCBS is a unidimensional tool, which includes 14 items and a 4-point Likert scale (Piredda et al., 2017). These items are observable variables related to the variable under investigation, namely, caring. A non-observable variable was defined as a "latent variable," a "dimension," or a "factor" (Barbaranelli & Ingoglia, 2013). The 14 NCBS items describe the nurses' attitude, the nurses' approach to the patient, and the nurses' respect for various possible needs as follows:

1. The nurses were polite, kind, and patient with me
2. When starting their shift, the nurses came to see me
3. The nurses came to see me, even when I did not call them
4. The nurses supported me during bad times
5. The nurses showed constant attention to my health status
6. Before doing anything to me, the nurses gave me the correct information, which was explained easily and clearly
7. The nurses performed care activities carefully
8. The nurses guaranteed my privacy during care procedures
9. The nurses supported me during times of doubt, fear, and uncertainty
10. The nurses made me feel free to call them at any time
11. The nurses treated me as a person and never as a number or a pathology
12. Even in the most busy and hard times, the nurses made time for me
13. The nurses constantly checked that I did not need anything
14. The nurses established good relationships with my family

Procedure

Context Adaptation Process. A panel of experts, made up of seven nurses and two pediatricians, adapted the sentences of the 14-item adult original NCBS to conform to the pediatric hemato-oncology setting. We established that the 14 statements should be preceded by the phrases “Do you think that...;” “with regard to yourself, can you say that...;” for the nurses’ pNCBS version (Appendix 1); and “Toward my son/daughter and myself, the nurses...;” for the caregivers’ cgNCBS version (Appendix 2).

We also changed the Likert Scale by adding one point to the pre-existing four points in order to give respondents an option to be neutral (point 3) and avoid distortions due to forcing choices of answers towards the extremes. In the modified versions, nurses and caregivers were asked to indicate how often each caring behavior was performed on a 5-point Likert scale, from 1 = never, 2 = rarely, 3 = sometimes, 4 = often, to 5 = always (range 14–70). For these questions, nurses measured their own caring behaviors (self-reported caring levels), and caregivers measured the nurses’ caring behaviors.

The nurse version was also available to be completed on-line. Both versions were preceded by a socio-demographic questionnaire.

Statistical Analysis. We performed descriptive analyses and psychometric tests. In particular, we performed preliminary factorability tests, namely Bartlett’s test of sphericity and the Kaiser–Meyer–Olkin (KMO) index of sampling adequacy. The exploratory factor analysis (EFA) was carried out with the maximum likelihood method and the GEOMIN oblique rotation (Muthén & Muthén, 2012). Statistical analyses were performed with SPSS 22.0 (IBM Corp. Armonk, NY, USA) and Mplus 6.12 (Muthén & Muthén, Los Angeles, CA, USA). We calculated the comparative fit index (CFI; values > 0.90 denoted a good fit), the root mean square error of approximation (RMSEA; values < 0.06 denoted a good fit), and the standardized root mean square residual (SRMR; values ≤ 0.08 denoted a good fit) (Muthén & Muthén, 2012).

The sample size of choice was 1:10 as it is the minimum established in order to achieve statistical significance (Kline, 2015). Hence, being ours both 14-items scales, the minimum numbers of participants were 140 nurses and 140 caregivers.

Results

Sample. A total of 381 participants were included: 193 nurses (mean age: 41 years ± 10.4, range: 22–64) and 188 caregivers (mean age: 41 years ± 8.9, range: 18–76). The majority of the participants were women (87.6 % nurses; 79.8% caregivers). The nurses work experience in PHO setting was over two years (82.9% of the sample); the period of children treatment was similar but the majority of them was in therapy for more than two years (37.8% of the patients). The nurses’ education data show that 20.2% of them held a clinical or management master (Table 1).

The geographical locations of the Pediatric Hemato-Oncology centers of the nurses and caregivers (*) who participated in this study were the following: Bologna*, Bolzano, Brescia, Cagliari, Catania*, Catanzaro*, Firenze, Genova, San Giovanni Rotondo (FG)*, Lecce, Milano, Modena, Monza, Napoli, Padova, Palermo*, Parma, Pavia, Pisa, Roma, Siena, Torino, Trieste*, Udine, Verona.

Descriptive Analysis. The descriptive analyses of the participants’ answers showed that the caring scores were high in both populations. As this is an unidimensional scale we have one value per sample. The mean score values, which show comparable results, were as follows: 4.5 (*SD* 0.6) and 4.4 (*SD* 0.8) for nurses and caregivers respectively (Table 2).

TABLE 1. Sociodemographic Characteristics of Nurses (N = 193) and Caregivers (N = 188) that Care for Pediatric Patients with Hemato-Oncologic Disorders

Characteristic	Nurses		Caregivers	
	N	%	N	%
Gender				
Male	24	12.4	38	20.2
Female	169	87.6	150	79.8
Nurse work in PHO/	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Caregiver duration of treatment				
0–6 months	10	5.2	58	30.9
7 months-2 years	23	11.9	57	30.3
More than 2 years	160	82.9	71	37.8
Missing	0	0	2	1.1
Maximum level of nursing education	<i>N</i>	<i>%</i>		
Bachelor's degree in nursing	87	45.1		
Bachelor's degree in pediatric nursing	31	16.1		
Master's degree	11	5.7		
Master's (clinical or management)	39	20.2		
Missing	25	12.9		

PHO = Pediatric hemato-oncology.

Data Factorability Evaluation. The data set was considered suitable for factor analysis because the Kaiser–Meyer–Olkin (KMO) index was 0.872 for nurses and 0.937 for caregivers. In both cases Bartlett's test of sphericity resulted significant ($p < .001$) with and degree of freedom 91 and 105 respectively.

Psychometric Properties. The Exploratory Factor Analysis presented acceptable fit indices of the solution with one-factor model in both samples (Table 3).

Nurses: $\chi^2 = 769.36$ [$n = 193$], $P = .0001$; RMSEA = 0.082, 90% CI: [0.066; 0.098], $P = .001$; CFI = 0.853; TLI = 0.826; and SRMR = 0.065.

Caregivers: $\chi^2 = 1,406.69$ [$n = 188$], $P < .0001$; RMSEA = 0.089, 90% CI: [0.073; 0.104], $P = .001$; CFI = 0.914; TLI = 0.898; and SRMR = 0.053.

Reliability. The internal consistency of the scales results was demonstrated by using the factor determinacy values: 0.940 for the nurses' data set and 0.975 for the caregivers' one. Moreover all 14 items had correlations above 0.40, the factor loading values were in fact >0.40 for nurses and >0.60 for caregivers (Table 4).

Discussion

We tested the reliability of the two adapted versions of the adult Italian language Nurse Caring Behavior Scale (NCBS); The pNCBS and cgNCBS are the first instruments to have been specifically adapted for measuring caring in the pediatric setting. Hence our results are not comparable with the ones obtained by other pediatric caring scales.

In both our scales the single factor model yielded a satisfying fit with the nurses and caregivers' data-set and showed internal consistency to when assessing pediatric nurses' caring behaviors. The pNCBS and cgNCBS total score ranges from 14 to 70. We remem-

TABLE 2. NCBS Score Means

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Mean	SD
Nurses	4.8	4.6	4.0	4.5	4.7	4.7	4.8	4.7	4.5	4.7	4.9	4.1	4.2	4.5	4.5	0.6
Caregivers	4.5	4.2	4.0	4.4	4.6	4.4	4.4	4.4	4.5	4.4	4.5	4.3	4.3	4.5	4.4	0.8

Note. *SD* = standard deviation.

TABLE 3. EFA Model Fit Information

Description	Nurses (<i>N</i> = 193)	Caregiver (<i>N</i> = 188)
	values	values
RMSEA	0.082	0.089
90% CI	[0.066; 0.098]	[0.073; 0.104]
Probability RMSEA < .05	0.001	0.001
CFI	0.853	0.914
TLI	0.826	0.898
SRMR	0.065	0.053
Chi-square	769.365	1406.692
Degrees of freedom	91	91
<i>P</i>	.0001	<.0001

Note. Chi-Square refers to test of model fit for the baseline model.

TABLE 4. Item Factor Loadings

Item	Nurses (<i>N</i> = 193)	Caregiver <i>N</i> = 188
1	0.484	0.680
2	0.413	0.656
3	0.537	0.619
4	0.667	0.761
5	0.518	0.831
6	0.609	0.711
7	0.529	0.801
8	0.568	0.718
9	0.727	0.756
10	0.439	0.733
11	0.530	0.855
12	0.622	0.748
13	0.705	0.742
14	0.648	0.824
Factor score determinacy coefficients	0.940	0.975

ber that the items describe nursing performance that has been clearly defined based on the measurement of caring (Sitzman & Watson, 2019). The high caring scores found in both samples indicate that the nursing performance was satisfactory. However, it must be taken into account that participation in the study was on a voluntary basis. This could constitute a bias as it is possible that only the most sensitive participants to this issue filled out the scale, leading to a possible overestimation. Another limitation is that caregiver data were collected only from six PHO Italian centers, therefore not representing the reality of the PHOs in this country (Italy).

The use of the same tool for both caregivers and nurses allowed us to compare two points of view; we found a slight discrepancy between the nurses and the caregivers' scores. This gap could be caused by both the nurses' self-overestimation and excessive expectations on the part of the caregivers. However, it suggests that there may be room for improvement and research.

We showed that NCBS is an easy-to-use self-evaluation tool that can help in terms of self-training, since negative feedback from caregivers can prompt nurses to improve their caring skills, a most welcome accomplishment particularly in PHO, where patients are twice as fragile due to their age and the nature of their health problems.

In conclusion, this tool is applicable also in the PHO setting, it offers a convenient instrument both for the everyday measurement of the level of caring and for the implementation of further research findings.

Relevance to Nursing Practice, Education or Research

In nursing practice the scale's concreteness and brevity favors its use. Nurses can self-assess and improve their ability to meet the patients' needs, preventing stress and burn-out. Also, the use of the tool can improve family compliance and periodic self-assessments by the staff and feedback from caregivers can raise awareness and promote attention to the quality of caring.

In the area of nursing education, the NCBS has the potential to further develop novel educational courses for nurse staffs.

With regard to nursing research, the tool can be used to obtain new data through the periodic monitoring of healthcare quality in pediatrics and through the validation of the NCBS for other health-care workers such as physicians and paramedics and to investigate levels of caring using larger and more diversified samples as well.

Furthermore the tool can be used to explore the hypothesis of the correlation between caring behaviors and other variables such as professional satisfaction, quality of professional performance, self-efficacy, stress levels, self-reflection and the relationship between nurses, patients and their families.

Finally, it can also be used to develop mixed methods research in the field of pediatrics drawing on narrative medicine or other qualitative research on caring.

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APPENDIX 1
APPENDIX 1A. Nurse Caring Behavior Scale per l'infermiere che lavora in pediatria—pNCBS—Italian

VALUTAZIONE DELL'ASSISTENZA INFERMIERISTICA—VERSIONE INFERMIERI

Ritiene di poter dire di sé stesso/a:	Mai	Raramente	A volte	Spesso	Sempre
Si mostra cortese, gentile e paziente nei confronti dei pazienti e dei caregivers					
All'inizio del proprio turno di lavoro, saluta i pazienti ed i relativi familiari					
Le capita di andare a trovare un paziente anche se nessuno lo ha chiamato					
Dà conforto ai pazienti nei momenti difficili					
Mostra costante attenzione per lo stato di salute dei pazienti					
Prima di svolgere un'attività assistenziale, fornisce la giusta informazione con un linguaggio semplice e comprensibile					
Svolge le attività assistenziali con particolare attenzione					
Tutela la privacy dei pazienti durante le attività assistenziali					
Supporta i pazienti nei momenti di dubbi, paure e incertezze					
Fa sentire liberi i pazienti di chiamarla in ogni momento					
Tratta tutti i pazienti come "persone" e non come "patologie"					
Anche nei momenti più faticosi, "trova tempo" per ogni paziente					
Si accerta costantemente che i pazienti non abbiano bisogno di nulla					
Instaura buoni rapporti con i familiari dei pazienti					

Note 1. Nurse Caring Behavior Scale (Piredda et al., 2017) adattato con il permesso dell'autore, 2021.

Note 2. La scala era in italiano al momento della compilazione.

APPENDIX 1B. Nurse Caring Behavior Scale for pediatric nurses—pNCBS—English

EVALUATION OF THE NURSES' CARE—NURSES' VERSION

<i>Do you think you can say that</i>	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>	<i>Always</i>
<i>You were polite, kind and patient toward the patients and their caregivers</i>					
<i>At the beginning of your shift, you greeted the patients and their relations</i>					
<i>You checked on the patients even when they didn't call you</i>					
<i>You comforted the patients when they were experiencing distress</i>					
<i>You paid constant attention to the patients' health conditions</i>					
<i>Prior to starting your nursing work, you gave patients the necessary information using a clear and simple language</i>					
<i>You carried out your nursing tasks with great attention</i>					
<i>You preserved the privacy of all the patients during your nursing tasks</i>					
<i>You supported the patients when they had doubts, fears or experienced feelings of uncertainty</i>					
<i>You made patients feel they could call you any time</i>					
<i>You treated every patient as a "person" not as a "pathology"</i>					
<i>Even during the most stressful moments, you managed to find time for every patient</i>					
<i>You made sure that patients were taken care of all the time</i>					
<i>You established a good relationship with the patients' relations</i>					

Note 1. Nurse Caring Behavior Scale (Piredda et al., 2017) adapted with permission of the author, 2021.

Note 2. The instrument was in Italian when completed.

APPENDIX 2

APPENDIX 2A. Nurse Caring Behavior Scale per il genitore (caregiver)—cgNCBS—Italian

VALUTAZIONE DELL'ASSISTENZA INFERMIERISTICA—VERSIONE GENITORE (CAREGIVER)

Ritiene di poter dire degli infermieri che:	Mai	Raramente	A volte	Spesso	Sempre
Si mostrano cortesi, gentili e pazienti					
All'inizio del proprio turno di lavoro, vengono a salutarci					
Vengono a trovarci anche se non chiamati					
Ci incoraggiano nei momenti difficili					
Mostrano attenzione per lo stato di salute del bambino					
Prima di svolgere un'attività assistenziale, forniscono la giusta informazione con un linguaggio semplice e comprensibile					
Svolgono le attività assistenziali con particolare attenzione					
Tutelano la nostra privacy durante le attività assistenziali					
Ci supportano nei momenti di dubbi, paure e incertezze					
Ci fanno sentire liberi di chiamarli in ogni momento					
Ci trattano come "persone" e non come numero o come "patologia"					
Anche nei momenti più faticosi, "trovano tempo" per noi					
Si accertano che non abbiamo bisogno di nulla					
Instaurano con noi un buon rapporto					

Note 1. Nurse Caring Behavior Scale (Piredda et al., 2017) adattato con il permesso dell'autore, 2021.

Note 2. La scala era in italiano al momento della compilazione.

APPENDIX 2B. Nurse Caring Behavior Scale for pediatric caregivers—English

EVALUATION OF THE NURSES’ CARE—CAREGIVERS’ VERSION

	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>	<i>Always</i>
<i>I think that the nurses:</i>					
<i>were polite, kind and patient</i>					
<i>at the beginning of their shifts they greeted us</i>					
<i>came to see us even if we hadn't called them</i>					
<i>encouraged us during particularly distressful moments</i>					
<i>paid attention to our child's health conditions</i>					
<i>prior to carrying out their nursing work, they gave us the right information using a simple and clear language</i>					
<i>carried out their nursing tasks with great attention</i>					
<i>preserved our privacy during their nursing activities</i>					
<i>supported us when we had doubts, fears or experienced feelings of uncertainty</i>					
<i>made us feel we could call them any moment</i>					
<i>treated us as "persons" not as mere numbers or pathologies</i>					
<i>even during the most stressful moments, they managed to find time for every patient</i>					
<i>made sure we were alright all the time</i>					
<i>established a good relationship with us</i>					

Note 1. Nurse Caring Behavior Scale (Piredda et al., 2017) adapted with permission of the author, 2021.

Note 2. The instrument was in Italian when completed.

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