



Research Article

PSYCHOMETRIC EVALUATION OF GOOD NURSING CARE SCALE IN CORONARY CARE UNIT'S PATIENTS

Fatemeh Bahrami^{1,3}, Shirin Hasanvand^{2,3*}, Fateme Goudarzi^{2,3}, Farzad Ebrahimzadeh⁴, Helena Leino-Kilpi⁵

¹Student Research Committee, Lorestan University of Medical Sciences, Khorramabad, Iran

²Social Determinants of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

³Department of Nursing, School of Nursing & Midwifery, Lorestan University of Medical Sciences, Khorramabad, Iran

⁴Department of Biostatistics and Epidemiology, School of Health and Nutrition, Lorestan University of Medical Sciences, Khorramabad, Iran

⁵Department on Nursing Science, University of Turku, Turku, Finland

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ABSTRACT

This paper describe translate and psychometric evaluation of Persian version of Good Nursing Care Scale (GNCS) for patients (GNCS-P). In this methodological study, scale was translated. Then, face and content validity of the Persian version of GNCS-P were assessed. To assess construct validity, the scale was completed by 200 coronary care unit's patients. Reliability was assessed through test-retest and internal consistency method. Data were analyzed in AMOS-21 and SPSS-21 software programs. Scale-Content Validity Index (S-CVI) was calculated as 0.91. Cronbach's alpha coefficients were determined 0.95 for the scale, and between 0.79 and 0.92 for its dimensions. The results of confirmatory factor analysis confirmed the validity of the scale and its dimensions. Therefore, the Persian version of GNCS-P has favorable validity and reliability, and can be used in assessing the quality of nursing care in the Iranian cardiac patients.

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INTRODUCTION

Cardiovascular diseases are most important factors threatening people's health in most countries and Iran (Bahonar *et al.*, 2010).

In response to this challenge (Duffy, 2008), and defects in providing patient care (Connell, 2008), it is imperative to improve the quality of nursing care (Duffy, 2008). Recent studies have shown that improving the quality of care can be effective in reducing deaths caused by cardiovascular diseases (Connell, 2008).

Patients admitted to the cardiac care units (CCU) are faced with countless problems due to their rapid changes in physical and mental conditions. Particular attention to patient needs and early provision of care are essential to supporting them (Ääri *et al.*, 2008). Given the greater sensitivity to issues relating to intensive care patients, nurses' behavior and their performance in care are among the most important factors affecting patients' health (Suhonen *et al.*, 2012). Despite the evidence indicating a relationship between the quality of nursing care and patient recovery (Duffy, 2008), the quality and even provision of

appropriate care for a large percentage of patients may be compromised for reasons such as lack of systematic nursing care and the effect of local conditions on the quality of care. As a result, investigating this issue will lead to improvement in the quality of care (Siegel *et al.*, 2012).

Based on the reports and studies conducted in Iran, patients consider nursing care provided as unfavorable in the majority of cases (Ahmadi *et al.*, 2011; Dabirian *et al.*, 2008), and healthcare providers in Iran believe patients are not competent to express their satisfaction or dissatisfaction with the care they receive. Yet, no one can judge the care they receive better than the clients (Mahmoodishan *et al.*, 2009).

Because of the dynamics of the concept of quality of nursing care, and the different interpretations of beneficiaries (Lucas-Carrasco *et al.*, 2011), further clarification of this concept requires the perspective of patients and nurses to be considered in the analysis of this concept (Ääri *et al.*, 2008), so that further development of clinical interventions and management of chronic diseases such as cardiovascular diseases can be helped through careful examination of these perspectives (Granger *et al.*, 2006).

Quality assessment for finding the right approach and ensuring improvement in the quality of care is a serious global challenge (Sidani *et al.*, 2004). Thus, evaluating the

*Corresponding author: **Shirin Hasanvand**

Social Determinants of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

effectiveness of care depends on its correct measurement (Gadotti *et al.*, 2006).

Tools for health sciences have witnessed a significant increase in recent decades, and many articles aiming to assess their psychometric properties have been published (Gadotti *et al.*, 2006). Common findings of this group of studies have shown that the tools designed were not accepted by nurses or applicable in many cases, or no agreement was reached on their terms, definitions, or psychometric properties (Mokkink *et al.*, 2012).

Based on the existing literature in Iran, only the study by Zeraati and Masoudi Alavi (2014) assessed a tool on the quality of nursing care in the intensive care units. Given the fact that this tool measures only the physical dimension of the care, it does not appear to be an appropriate tool for measuring the quality of nursing care in CCU.

A prerequisite for any research is a valid and reliable tool (Mokkink *et al.*, 2012). Given the significant increase in the number of scientific tools (Gadotti *et al.*, 2006), choosing the right tool for measuring variables has turned into a major challenge for researchers. A tool, especially for subjective variables, requires psychometric assessment. (Mokkink *et al.*, 2012). One of the scales used for measuring the quality of care is Good Nursing Care Scale (GNCS), developed by Leino-Kilpi and Vuorenheimo (1994). Several studies utilized GNCS between 1995 and 2015 in various populations and countries (University of Turku, 2014). In addition to the physical aspects, GNCS considers psychological and environmental aspects and participation of relatives, and it has used to analyse also the factors connected with the quality, like family members' participation (Leino-Kilpi *et al.*, 2016) and knowledge received by patients (Leino-Kilpi *et al.*, 2015).

You maybe can add these references, because they show, hiw the scale has been used for testing the connections between the quality of care and some factors. I add the references in the list, in the case you want to use them.

GNCS has shown high validity and reliability in several studies, too (Donmez and Ozbayır, 2011; Leinonen *et al.*, 2003; Rehnström *et al.*, 2003; Zhao and Akkadechanunt, 2011); however, it does not mean GNCS will show the same psychometric properties in every culture after translation (Nazifi *et al.*, 2014). Given the importance of the quality of nursing care in patients admitted to CCUs in the socio cultural context of Iran, and given lack of a specific valid and reliable scale in this field, the present study was conducted with the aim to translate Good Nursing Care Scale for patients (GNCS-P) and assess its psychometric properties in patients admitted to CCUs.

MATERIALS AND METHODS

The present methodological study was conducted to validate the Persian version of GNCS-P. GNCS-P is one of the most common (Zhao and Akkadechanunt, 2011) and few scales that measure the quality of care from patients' and nurses' perspective. The first version of this tool was developed and psychometrically assessed in 1994 by Leino-Kilpiand and Vuorenheimo (1994) in Finland in two separate forms: GNCS-P (for patients) and GNCS-N (for nurses). The scale has been revised three times so far by the original designer. In the present study, the latest version (2013) and patient version

were used. Several studies conducted in different countries such as Australia, Bangladesh, China, Estonia, Lithuania, Germany, Portugal, Sweden, Turkey, and Thailand have used (University of Turku, 2014) and validated (Donmez and Ozbayır, 2011; Leinonen *et al.*, 2003; Rehnström *et al.*, 2003; Zhao and Akkadechanunt, 2011) this scale between 1995 and 2013. Scoring in this scale is based on a Likert scale from totally agree (4 points) to no comment (0 point). It has two parts: the first part includes demographic details of patients (16 items), and the second contains 40 items in seven dimensions: (nursing staff characteristics (5 items), care-related activities (6 items), preconditions for care (5 items), nursing environment (5 items), course of the nursing process (6 items), patient's coping strategies (7 items), and collaboration with relatives (6 items). Mean score for each dimension ranges 1-4 points, and the mean score of 1-1.5 shows very poor quality of care, 1.6-2 poor quality of care, 2.1-2.5 fairly poor quality, 2.6-3 fairly high quality, 3.1-3.5 high quality, and 3.6-4 very high quality.

In the present study, permission was obtained from the ethics committee of Lorestan University of Medical Sciences (Code: LUMS.REC.1395.122) and the designer of the tool (Leino-Kilpiand and Vuorenheimo, 1994). First, measures were taken to prepare the Persian version of GNCS-P through the 10-step guideline of Wild *et al.* (2005). The scale was translated by two bilingual translators separately, and items of the two translated versions were merged. Next, the scale was backward translated by two independent bilingual translators, and merged. Then, the final version was modified based on the designer's comments. To obtain cognitive debriefing and assess people's ability to understand and interpret them, the scale was given to eight patients in CCU, and attempts were made to ensure that these patients represented the study population in terms of the hospital, age, gender, current living conditions, education, employment, the city, place of residence (urban or rural), language, and satisfaction with monthly income (Low, Medium, High). The "think aloud interview" technique was used, and interviewees were asked to recite each item aloud. After interviewing each patient and receiving their views, necessary corrections were implemented. Then, any grammatical, syntax, or typing errors were corrected and the final version of the scale was prepared. Summary of the ten-step translation of the scale based on Wild *et al.* (2005) guideline shown in Figure 1.

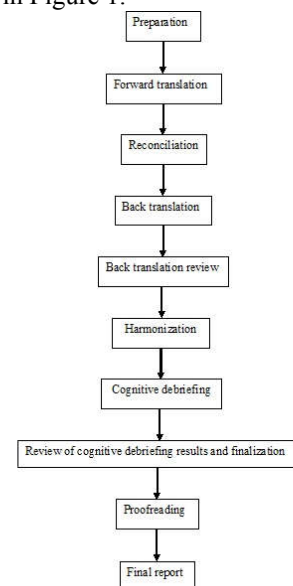


Figure 1 Summary of the ten-step translation of the scale based on Wild et al. (2005) guideline.

In the second stage, psychometric properties of the Persian version of GNCS-P were assessed.

The study setting and participants

The study population comprised 200 patients admitted to CCUs of ten public hospitals in the province of Lorestan (in Iran) by non-probability method from March 2016 to May 2017. Inclusion criteria were willingness to participate, minimum 18 years of age, minimum 72-hour stay in CCU, orientation to person, time and place, no medical history of Alzheimer's, hearing ability, and minimum reading and writing literacy. Patients unwilling to cooperate and those with acute diseases were excluded. Initially the researcher introduced herself to participants, gave necessary explanations, assured them of confidentiality of data, and obtained their informed consents, and then gave the questionnaire to participants for completion.

Face and content validity

CVI was calculated through an expert panel of 15 people (five faculty members, two nursing officers, two training supervisors, two clinical supervisors, one quality improvement expert, one clinical accreditation and governance expert, and two CCU head nurses) in terms of "relevance" of the construct. The scale content validity index (S-CVI) was found by the average method. Content validity ratio (CVR) was assessed according to a 3-point Likert scale from "necessary = 3 points", "useful but unnecessary = 2 points" and "unnecessary = 1 point". Based on Lawshe Table, and the number of experts, the minimum numerical value of CVR was considered 0.62. To assess face validity, the scale was made available to eight cardiac patients in the CCU. In addition, a panel of experts concurrently assessed face validity of the scale based on item difficulty, relevance, and ambiguity.

Construct validity

Construct validity was assessed by confirmatory factor analysis, and fit indices. In the present study, to assess model fitness, values of Chi-square, relative Chi, GFI, NFI, CFI, AGFI, RFI, TLI, PCFI, PNFI, and RMSEA were used.

For construct validity, a cut-off point of 0.3 was considered for standardized regression weight. In other words, items with regression weightless than 0.3 were eliminated (Tinsley and Brown, 2000).

Assessment of reliability

Reliability of the scale was assessed through test-retest and internal consistency with Cronbach's alpha coefficient. Polit and Beck consider Cronbach's alpha of 0.7 as adequate, and greater than 0.8 as highly consistent (Polit and Beck, 2008). For test-retest, 25 cardiac patients (from three hospitals) were selected by convenience sampling. The scale was completed twice with 72-hour interval, and Intra-Class Correlation (ICC) was calculated. As recommended by Shrout and Fleiss (1979), ICC < 0.3 was considered unworthy of reporting and items scoring below this limit were excluded.

RESULTS

A total of 200 cardiac patients from ten hospitals in the province of Lorestan in Iran were enrolled, of whom 52.3% were men. Participants' mean and standard deviation of age

was 52.7 ± 15 years, 51.8% had primary school education, 34.2% were employed, 16.1% unemployed, and 37.2% housewives. The majority of patients lived in the city with their spouse or relatives (87.9%), and 59.8% of patients were moderately satisfied with their monthly income. Table 1 presents participants' demographic details.

Table 1 Demographic characteristics of participants.

	Variables	Frequency/ Mean ± SD
Hospital	Shahid Madani Khorram Abad	12.6%
	Shahid Rahimi Khorram Abad	9%
	Shohada Aashayer Khorram Abad	9.5%
	Hafte Tir Doroud	12.6%
	Imam Khomeini Boroujerd	10.1%
	Imam Khomeini Pole-Dokhtar	5.5%
	Imam Khomeini Koohdasht	12.6%
	Ebne-Sina Nourabad	9%
	Imam Jafar Sadegh Aligoudarz	14.1%
	Shahid Valian Aligoudarz	5%
	Khorramabad	23.1%
	Koohdasht	14.6%
	Alashtar	4%
City	Doroud	11.1%
	Aligoudarz	18.1%
	Azna	1.5%
	Nourabad	8.5%
	Pole-Dokhtar	5%
	Boroujerd	11.1%
	Cities outside of Lorestan province	3%
Place of residence	Urban	62.8%
	Rural	36.7%
Language	Persian (official language of Iran)	16.1%
	Non-Persian (unofficial language of Iran)	83.9%
Age	---	52.7 ± 15.0*
Gender	Female	47.7%
	Male	52.3%
Current living conditions	Living alone	12.1%
	Living with spouse or relatives	87.9%
Education	Elementary	51.8%
	Diploma	33.7%
	Associate	13.6%
	Bachelor	0.5%
	Master's degree and higher	0.5%
Employment	Employed	34.2%
	Unemployed	16.1%
	Retired	10.6%
	Housewife	37.2%
Satisfaction with monthly income	student	2%
	Low	36.2%
	Medium	59.8%
	High	4%

*Mean ± S.D

Face and content validity

After changing certain items for qualitative assessment of content validity, I-CVIs obtained quantitatively were greater than 0.78. S-CVIs were also found based on the criteria of relevance = 0.91. Based on Lawshe Table and the number of experts, minimum numerical value of CVR was considered 0.62, and thus none of the items was excluded. In assessing face validity, useful comments made by experts and participants were implemented in the questionnaire.

Construct validity

Some references have cited Chi-square ≤ 2 (Lamoureux et al., 2007), and it was found 1111.442 in the present study, which was significant. Generally, relative Chi-square between 1 and 2 is considered a good fit index (Hair et al., 2006), which was found 1.661 in the present study. Sharma believes that values higher than 0.9 in other fit indices as excellent fit, between 0.8

and 0.9 as good fit, and between 0.7 and 0.79 as acceptable fit and for RMSEA, values less than 0.1 as good to excellent fit, and between 0.11 and 0.2 as acceptable fit (Sharma, 1996). Assessing fit indices showed that these indices were within good to acceptable range. These indices are shown in Table 2.

Table 2 Fit indices of confirmatory factor analysis of the complete Persian version of GNCS-P.

Factor	Value
X ²	1111.442
Df	669
P-value for X ²	0.001
X ² /df	1.661
GFI	0.78
AGFI	0.73
NFI	0.81
CFI	0.91
RFI	0.77
TLI	0.89
PCFI	0.78
PNFI	0.70
RMSEA	0.059
CI 90% for RMSEA	0.053 - 0.065
P-value for RMSEA	0.008

Note: X² = Chi-square goodness of fit statistic; df = Degree of freedom; X²/df = Relative chi-square; GFI = Goodness of fit index; AGFI = Adjusted goodness of fit index; NFI = Normal fit index; CFI = Comparative fit index; RFI = Relative fit index; TLI = Tucker-Lewis index; PCFI = Parsimony comparative fit index; PNFI = Parsimony normal fit index; RMSEA = Root-mean-square error of approximation.

Factor analysis assessed correlation coefficient between sub categories, and the lowest correlation coefficient (0.39) was found between nursing environment and collaboration with relatives, and the highest (0.85) between care-related activities and preconditions for care. Table 3 presents correlation coefficients between sub categories of GNCS-P.

Table 3 Correlation coefficients between sub categories of GNCS-P.

Sub categories	Nursing staff characteristics	Care activities	Prerequisites of care	Nursing setting	The process of nursing	Patient's coping strategies
Care activities	0.723*	-	-	-	-	-
Prerequisites of care	0.696*	0.852*	-	-	-	-
Nursing setting	0.623*	0.791*	0.849*	-	-	-
The process of nursing	0.578*	0.768*	0.754*	0.780*	-	-
Patient's coping strategies	0.644*	0.688*	0.706*	0.582*	0.783*	-
The participation of relatives	0.512*	0.542*	0.495*	0.394*	0.575*	0.537*

*Significant at level P < 0.001

The standardized regression weight of items varied from 0.41 (item 44) to 0.90 (Item 54) and was within the acceptable range (P ≤ 0.001).

Reliability

Assessing the consistency lead to the elimination of items 19, 40, and 43 for having ICC < 0.3. These items assessed "Nurses answering to all patient questions", "Allow the patient to stay in the hospital until recovery" and "Knowing the allowed work at home, given the recent surgery, treatment and care". Following the elimination of these items, significant stability was observed between the scores from the first and the second tests, which confirms repeatability of subscales and the entire scale, and high stability in the Persian version of GNCS-P. Cronbach's alpha was within the acceptable range for subscales and the entire scale, and thus no item was eliminated. The results of reliability, and standardized regression weight for each item of GNCS-P are shown in Table 4.

DISCUSSION

The present article is the first report on psychometric testing of the Persian version of GNCS-P. According to the results, the Persian version of this scale has good validity and reliability. A review of literature showed no standard tool for determining the quality of nursing care in Iran.

GNCS-P is a reliable tool, and showed good psychometric properties in different populations of children, adults and older adults, and in various wards including general, psychiatry, gynecology, dentistry, and radiography, and in many countries such as Australia, Bangladesh, China, Estonia, Lithuania, Germany, Portugal, Sweden, Turkey, and Thailand (University of Turku, 2014). Some of the strengths of the present study include translation of the scale using guidelines, assessment of face, content and construct validities, and reliability of the Persian version of GNCS-P at 2013, using stability and internal consistency methods in patients admitted to CCUs. Meanwhile, it was used on a population of cardiac patients only in Finland in 2006 as a Ph.D. thesis, which also investigated internal medicine patients (Ruotsalainen, 2006).

In the present study, content validity ratio for all items was greater than 0.62, I-CVIs was higher than 0.78 and S-CVI was 0.91 that indicating a good content validity for the Persian version of nursing care scale.

Cronbach's alpha coefficient was 0.95 that indicating high internal consistency of items and high reliability of the entire scale. Zhao and Akkadechanut (2011) reported Cronbach's alpha coefficient of 0.81 and content validity of 0.91 after adjusting the old version of this scale and modifying it into five dimensions. Leinonen *et al.* (2003) in Finland adjusted GNCS in 1994 for comparing perspectives of patients and nurses in surgery wards. Cronbach's alpha coefficient varied from 0.5 to 0.84 in GNCS-N, and from 0.14 to 0.86 in GNCS-P. Furthermore, consistency between subscales ranged from 0.27 to 0.71 in GNCS-P and from 0.1 to 0.62 in GNCS-N (Leinonen *et al.*, 2003).

In Turkey, Donmez and Ozbayir (2010) assessed psychometric properties of adjusted Leinonen scale (2003), and reported Cronbach's alpha of 0.94 for GNCS-N and 0.93 for GNCS-P. In Sweden, Rehnstrom *et al.* (2003) investigated cultural adaptability and validation of GNCS-P in 1994. Item-item consistency coefficient ranged from 0.15 to 0.91, and item-scale consistency coefficient was ≥ 0.3 where two items had been eliminated for scoring less than this value. Cronbach's alpha was 0.8, and Test-retest correlation coefficient for the entire scale was reported 0.75 (Rehnström *et al.*, 2003). Another form of examining reliability is test-retest, which refers to measurement consistency. In the present study, three items had ICC < 0.3, and were eliminated from the scale.

According to the confirmatory factor analysis results, the present study scale showed suitable fit for the Iranian society, and factor loading of all items was found 0.3 and higher, which was acceptable. In can be seen that Chi-square is significant in the present study that this is due to the large sample size (Sharma, 1996). Relative Chi-square was 1.66 and other fit indices also had good or acceptable values, indicating good model fit. Finally, RMSEA was found 0.059, which is considered favorable.

Table 4 Results of reliability, standardized regression weight, and r^2 for each item of GNCS-P.

Sub scale	Item	Standardized regression weight	P-value	r^2	ICC	Cronbach's alpha
Nursing staff characteristics	17- They were friendly with me	0.625	< 0.001	39%	0.52	0.87
	18- They performed treatment and care accurately	0.662		43.8%	0.76	
	19- They were able to answer all my questions	0.768		59%	0.10	
	20- They were service-oriented	0.858		73.6%	0.78	
	21- They were honest with me	0.764		58.4%	0.69	
	22- I received enough information about care and treatment	0.618		38.2%	0.73	
	23- All my care procedures were performed professionally	0.717		51.4%	0.97	
Care activities	24- I have been advised to observe my disease symptoms and feelings and report them to nurses	0.689	< 0.001	47.5%	0.48	0.88
	25- Nurses listened to me when I talked about my concerns	0.726		52.7%	0.43	
	26- Nurses always obliged me understand whatever I wanted to know	0.859		73.7%	0.79	
	27- During my care and treatment, they encouraged me, and emotionally supported me	0.823		67.7%	0.93	
	28- The nurses' knowledge and skills were up-to-date	0.565		31.9%	0.95	
Prerequisites of care	29- The nurses used research results in caring for me	0.828	< 0.001	68.5%	0.88	0.79
	30- The hospital/ward had enough resources and facilities for my care	0.581		33.7%	0.67	
	31- My interest was a priority	0.525		27.6%	0.48	
	32- They had good professional experience, which helped them in their jobs	0.483		23.3%	0.66	
	33- In this hospital/ward I felt safe in every way	0.657		43.1%	0.73	
	34- My integrity in patients' room was preserved	0.644		41.5%	0.65	
	35- The necessary precautions were taken to prevent the spread of infections	0.713		50.8%	0.58	
Nursing setting	36- Nurses performed my medical procedures properly	0.871	< 0.001	75.9%	0.36	0.85
	37- Nurses identified and confirmed my identity, and then performed my care procedures	0.680		46.2%	0.92	
	38- I was sufficiently quickly admitted for treatment this time	0.659		28.2%	0.52	
	39- Different centers (like, health centers, private surgeries, hospitals) had adequate collaboration for my care	0.662		44.8%	0.70	
	40- I was allowed to stay in hospital until my recovery	0.537		25.7%	0.20	
The process of nursing	41- I was notified early about my discharge, so preparations could be made at home	0.507	< 0.001	28.9%	0.77	0.79
	42- I am familiar with signs of possible complications, and I know what to do at home and whom to contact	0.670		43.8%	0.61	
	43- Given the surgery, treatment and care I had, I know what tasks I am allowed to do at home	0.531		43.4%	0.29	
	44- Through my previous hospital experience	0.410		16.8%	0.75	
	45- By making sure that I have adequate knowledge about my care, its methods, and different treatment options	0.580		33.6%	0.74	
	46- By opportunity to act independently	0.646		41.7%	0.78	
	47- By taking my views into account	0.649		42.1%	0.74	
Patient's coping strategies	48- Through open and confidential relationship with my nurses and doctors during my hospitalization	0.712	< 0.001	50.6%	0.56	0.84
	49- By becoming aware of economic benefits and costs	0.480		23.1%	0.33	
	50- Through providing the opportunity to ask about my disease and medical treatment, if necessary	0.734		53.8%	0.46	
	51- My relatives received adequate information about my care and treatment	0.880		62.5%	0.96	
	52- My relatives and I were sufficiently involved in planning my care and treatment	0.873		42.5%	0.97	
The participation of relatives	53- My relatives and I were adequately involved in assessment of my care and treatment	0.907	< 0.001	41.3%	0.89	0.92
	54- My relatives were heard when they wanted to talk about me and the problems related to my treatment and care	0.642		82.3%	0.86	
	55- In the course of my treatment and care, my relatives received encouragement and mental support	0.652		76.2%	0.81	
	56- Nurses spent sufficient time with my relative	0.791		77.4%	0.89	
Total						0.95

The final version of the questionnaire, after eliminating items 19, 40, and 43, contained seven dimensions: nursing staff characteristics (4 items), care-related activities (6 items), preconditions for care (5 items), and nursing environment (5 items), and course of the nursing process (4 items), and patient's coping strategies (7 items), and collaboration with relatives (6 items). According to the present study results, the Persian version of GNCS-P with 37 items showed high face, content and construct validities and high internal consistency.

With such features as easy scoring, appropriate reliability and validity, applicability in different situations, and widespread use, this questionnaire is suitable for use not only in CCUs, but also in other wards and in para-clinical department for assessing the quality of health care services. This scale can be also a useful tool for measuring and evaluating planning, actions and interventions in the context of quality of nursing care.

Limitations

The present study limitations included tiredness of most patients in CCUs given their old age and the atmosphere of these wards, low level of literacy in most participants, personal and cultural differences in different cities of Lorestan Province, expression of feelings and emotions while responding to the questionnaire, and closing of one of the hospitals during sampling.

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