Quality of nursing care: instrument development and validation

Qualidade dos cuidados de enfermagem: construção e validação de um instrumento

Calidad de la atención de enfermería: construcción y validación de un instrumento

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ABSTRACT

Objectives: to describe the development and validation process of a scale to measure the nurses' perception of the activities that contribute to nursing care quality. **Method:** methodological study based on a literature review, the opinion of experts and the experience of study investigators. An instrument was designed containing six dimensions and 25 items, applied as a questionnaire to 775 nurses from a hospital in northern Portugal, from May to July 2014. The instrument validation used an exploratory factor analysis and an internal consistency assessment of each factor/dimension. **Results:** the factor analysis indicated the need to adjust the original composition of the scale, which then received one more dimension, totaling seven dimensions and the same 25 items, and presented a high internal consistency (Cronbach's alpha of 0.940). **Conclusion:** the final version of the scale presents adequate psychometric properties, with potential use in future studies.
Descriptors: Nursing; Health Care Quality Assurance; Nursing Services; Nursing Care; Validation Studies.

RESUMO

Objetivos: descrever o processo de construção e validação de uma escala para mensurar a percepção dos enfermeiros acerca das atividades que contribuem para a qualidade dos cuidados de enfermagem. **Método**: estudo de cunho metodológico pautado na revisão da literatura, na opinião de peritos e na experiência dos investigadores. Foi desenvolvido um instrumento contendo seis dimensões e 25 itens, sendo aplicado no formato de questionário a 775 enfermeiros em um hospital do norte de Portugal, no período de maio a julho de 2014. Para a validação empregou-se a análise fatorial exploratória e a avaliação da consistência interna de cada fator/dimensão. **Resultados**: a análise fatorial indicou para ajustes na composição original da escala, que passou a ser constituída por sete dimensões, mantendo-se os 25 itens, apresentando uma elevada consistência interna (alfa de Cronbach de 0,940). **Conclusão**: a versão final da escala apresenta adequadas propriedades psicométricas, revelando potencial para utilização em futuros estudos.
Descritores: Enfermagem; Garantia da Qualidade dos Cuidados de Saúde; Serviços de Enfermagem; Cuidados de Enfermagem; Estudos de Validação.

RESUMEN

Objetivos: describir el proceso de construcción y validación de una escala para medir la percepción de los enfermeros respecto de actividades que contribuyen a la calidad de la atención de enfermería. **Método**: estudio metodológico, basado en revisión de literatura, opiniones de peritos y experiencias de investigadores. Fue desarrollado un instrumento incluyendo 6 dimensiones y 25 ítems, en formato de cuestionario, aplicado a 775 enfermeros de hospital del norte de Portugal, entre mayo y julio de 2014. Para la validación, se utilizó análisis factorial exploratorio y una evaluación de consistencia interna para cada factor/dimensión. **Resultados**: el análisis factorial indicó necesidad de ajustar la composición original de la escala, que pasó a estar constituida por 7 dimensiones,

manteniéndose los 25 ítems, expresando elevada consistencia interna (alfa de Cronbach de 0,940). **Conclusión**: la versión final de la escala demuestra adecuadas propiedades psicométricas, expresando potencial para utilización en futuros estudios.
Descriptores: Enfermería; Garantía de la Calidad de Atención de Salud; Servicios de Enfermería; Atención de Enfermería; Estudios de Validación.

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INTRODUCTION

The concept of quality and the strategies to achieve it have changed over time by gradually incorporating new meanings[1]. "The movement for quality in health services is today a need incorporated into the management of various interrelated areas"[2]. This ensures safe service with excellence. In this perspective ensuring healthcare quality is understood as a multiprofessional task. Indeed, it is widely known that healthcare quality is not achieved through professional nursing practices alone. Moreover, professional nursing practice cannot be underappreciated or made invisible in the efforts to achieve healthcare quality[3].

Healthcare quality has been a concern formally assumed by international institutions, such as the World Health Organization and the International Council of Nurses, and other national organizations[3]. In Portugal, the quality of health services, a concern of the General Health Management[4], was consolidated in the National Health Plan for 2011-2016. It indicates the following determinants for healthcare quality: the adoption of quality standards; the definition and monitoring of indicators; internal and external assessments with subsequent comparisons between service providers.

Professional organizations operating in the health sector have a critical role in the definition of quality standards for each domain, which characterize the social mandates for each profession. These standards represent the desired global performance for nursing services; they can be tangible or intangible, general or specific, but always related to the targeted result. As essential references for nurses' performance, they provide parameters for service quality assessment. In agreement with some authors, service quality below the standard level is considered contrary to the knowledge developed in nursing care practices and the theoretical framework of nursing[5].

The current healthcare scenario and the economic and cultural conditions have created the ideal opportunity for nurses to reformulate their practice and define a new direction to nursing[6]. According to the OE - *Ordem dos Enfermeiros* (Order of Nurses)[3], of Portugal, defining quality standards for nursing care is a great challenge, not only due to the impact of improvements in nursing care provided to citizens, but also because of the need to rethink the professional practice of nurses. Despite different concepts from other countries, in Portugal, a healthcare quality standard is a statement that sets the base for professional action and is used as an excellence measurement tool[7].

In this context, the OE's Nursing Council, in an attempt to define quality standards for nursing care, presented six categories of descriptive statements: patient satisfaction; health promotion; prevention of complications; well-being and self-care; functional readaptation and nursing care organization. Aiming to explain the nature and the different aspects of social mandates in nursing, the descriptive statements are, for patients, the assurance of quality nursing care, and for nurses they are a common reference and guide for professional practice performed with excellence[3].

Considering this legal reality and the quality standards of nursing care as references of excellence, would not all nurses be expected to act according to these standards? With these quality standards in mind, it is clear that, although nurses recognize that they are able to act autonomously, they have to act in compliance with standards of excellence[7]. Indeed, despite providing a framework for the definition for a new direction and for quality nursing practices, the quality standards also require that nurses acting accordingly.

Considering that quality standards of nursing care have been defined in agreement with the reality and of the context in Portugal, it was decided to develop an instrument that would allow for the understanding of the quality of nursing care provided to patients. In agreement with some authors, it was recognized that it was relevant to use general quality standards, in terms of quality assessment and the process of nursing services. It was also decided to use this quality assessment as a multidimensional variable for these factors: patient satisfaction; health promotion; prevention of complications; well-being and self-care; functional readaptation and nursing care organization[8].

With the development and validation of an instrument to determine the nurses' perception of the activities that contribute to nursing care quality, it was admitted that it is "possible to collect data and transform them into essential information for effective management and make the nursing team aware"[9] of the need to improve the services provided.

When performing the literature review, investigations related to the perception of nursing care quality were found to be limited, which justifies the development of this study [8]. In agreement with some authors, it was believed that it was very important to obtain data related to the perception of nurses involved in the provision of nursing care. Programs and actions to improve quality require changes in services and depend largely on the commitment and dedication of nursing professionals [10]. In the context of this study perception was considered as a "process through which people organize and interpret their own sensory impressions to ensure a meaning to the environment where they are inserted" [10].

The organizers of this study felt that it was necessary to understand how nurses perceive the enforcement of quality

standards. Considering that any method to measure the nurses' perception of the activities that contribute to nursing care quality has not been identified, it was thought that the development of such an instrument was essential.

This study, as part of a broader investigation titled "Contributions of information technology to nursing management", aimed to present the development and validation process of a scale which has supported descriptive studies in countries like East Timor.

OBJECTIVE

The objective of this study was to describe the development and validation process of an instrument to measure the nurses' perception of the activities that contribute to nursing care quality.

METHOD

Ethical aspects

This study was approved by the Ethics Committee (159/2013) of the institution where it was conducted, and the participants were informed of the study objectives and of data confidentiality.

Design, study site and period

Methodological study for the development and validation of an instrument to determine the nurses' perception of the activities that contribute to nursing care quality. Data collection took place in a hospital in northern Portugal, from May to July 2014. The questionnaires were returned within 60 days.

Study population and sample

The study population included all nurses providing hospitalization services at a hospital in northern Portugal, totaling 2,280 nurses. The sample comprised all nurses who were willing to participate in the study. Nurses who had worked at that hospital for less than six months were excluded from the study.

Study protocol

This study was conducted in two stages. In the first stage, a literature review was performed, based on the investigators' experience, allowing for the building of a group of items with impact on nursing care quality. In the literature review, the ideas presented in the quality standards of nursing care proposed by the OE – *Ordem dos Enfermeiros* (Order of Nurses) [3], on which the new instrument was based, were essential.

25 items were described, which were rated according to a Likert scale of 4 answers: never (1); rarely (2); often (3); and always (4). The items were displayed on a board referred to as "scale of perception of nursing activities that contribute to nursing care quality" (EPAECQC).

The psychometric analysis of the instrument used the content validity, construct validity and internal consistency of factors/dimensions, measured by Cronbach's alpha coefficient.

The selection and inclusion of items for the scale were based on theory alone[11], through a bibliographic analysis. The content validity was based on the judgment of experts in the area. This type of validation would determine whether the instrument content effectively explored the requirements for the measurement of the investigated phenomenon[12].

In agreement with the reference, the list of items were analyzed by a group of experts who evaluated the clarity, understanding, and the relevance of the statements. The group of experts consisted of seven investigators from the Nursing School of Porto. All experts consulted returned the instrument and suggested small semantic adjustments in the statements, but no other major change. Given the simplicity and clarity of the instrument, it was not necessary to make other changes.

In the second stage, based on the results obtained, a questionnaire was developed, which had two parts. The first part showed the dimensions and their respective proposals: patient satisfaction (3 items); health promotion (3 items); prevention of complications (7 items); well-being and self-care (6 items); functional readaptation (4 items) and nursing care organization (2 items). The names of the dimensions were consistent with the quality standards of nursing care published in 2000 by the OE. The second part of the instrument presented the sociodemographic and professional data of respondents.

After observing the recommendations found in the literature, and aiming to assess the understanding and clarity of the items, a pre-test of the questionnaire was conducted, and then it was distributed to the subjects of the study.

Analysis of results and statistics

Data processing was conducted with software Statistical Package for the Social Sciences (SPSS), version 22.0. An exploratory factor analysis (EFA) was used to select the items for the final version of the scale of perception of nursing activities that contribute to nursing care quality, and Cronbach's alpha coefficient was used in the analysis of internal consistency for each dimension of the scale. The characterization of participants was through descriptive statistics.

RESULTS

This study included the participation of 775 nurses (34%) out of a total population of 2,280 professionals with a nursing license. Most of them were female, n = 661 (83.5%), aged between 24 and 61 years, mean age of 38.5 years (SD = 9.1). The time of professional practice ranged from 1 to 49 years (M = 17.3; SD = 10.6) and the time of professional practice in the current institution ranged from 1 to 38 years (M = 6.3; SD = 6.2). Regarding complementary training, 16.8% (n = 131) had a postgraduate diploma and 21% (n = 163) had a Master's degree. Most of them (62%) did not have any nursing specialized training. Of 294 nurses (38%) with specialized trainings, 30% had medical-surgical nursing specialization, 26.2% had rehabilitation specialization training, 16% had child health specialization, 11.4% had community nursing specialization, 9.3% had mother health specialization, and 6.8% had mental health specialization.

Regarding the scale items, besides the descriptive analysis, a construct validity analysis was performed through EFA, and an internal consistency analysis was performed using Cronbach's alpha coefficient calculation. A maximum error probability of 5% was considered.

The principal component analysis was used in the EFA, with orthogonal rotation according to Varimax and Kaiser normalization, eigenvalue > 1 criterion, which produced a 6-factor structure, similar to the original scale. Then, a factor structure comprised of six dimensions was obtained. The calculated sample adequacy index of Kaiser-Meyer-Olkin (KMO) was 0.936, leading to the conclusion that the factor analysis was very good =(13), with proper data matrix to perform it. Bartlett's test (p < 0.001) was considered significant.

When conducting the analysis of the first factor, two items with simultaneous saturation in two factors was observed (with minimum difference). Once these items were eliminated, a new factor analysis was conducted. The dimension "prevention of complication" appeared split and the dimension "health promotion" was lost, so, a new analysis was performed, assuming the items of "prevention of complication" were indeed saturating in different dimensions, forcing a 7-factor solution. The factor solution obtained with the items allocated to seven dimensions is illustrated in Table 1.

In this last factor solution, except for the "prevention of complications" that remained split in two dimensions, all other dimensions were benefitted by this factor solution. The KMO value was very good (0.942) and Bartlett's test was significant.

Internal consistency values for the dimensions obtained were calculated, with all dimensions presenting reasonable or good values, except for the dimension "nursing care organization".

After the analysis of results, it was found that some of them did not match the dimensions from the original version of the scale. Considering the inherent theoretical reference to each item, the factor analysis and the internal consistency analysis of each factor/dimension, some changes were made in the scale composition, adding one more dimension to total seven factors, rather than the original six dimensions.

With this scale reformulation to seven dimensions, Cronbach's alpha values contributed to the internal consistency of each factor/dimension.

Table 2 shows the final scale and the internal consistency of the instrument and dimensions. The internal consistency of total scale is excellent, Cronbach's alpha of 0.940.

The dimensions "well-being and self-care", "functional readaptation" and "responsibility and rigor" presented very good Cronbach's alpha values; the dimensions "patient satisfaction", "health promotion" and "prevention of complications" presented acceptable Cronbach's alpha values. The dimension "nursing care organization" presented an insufficient Cronbach's alpha value. The internal consistency of all factors combined, that is, from the total scale, was considered excellent, once Cronbach's alpha value corresponded to 0.940.

After the application of this scale based on the quality standards proposed by the OE (3), these qualities were observed in nurses who participated in this investigation. A constant search for professional excellence and the desire to achieve the highest levels of patient satisfaction, respect for the individual abilities, beliefs, values and desires of every patient (M = 3.53; SD = 0.542); showing empathy in interactions with patients (M = 3.53; DP = 0.535); and involving significant cohabitants of the patient in the nursing care process (M = 3.29; DP = 0.636).

Table 1 – Distribution of Varimax rotation matrix of the scale items, Portugal, 2015

Items	Factors						
	1	2	3	4	5	6	7
13	0.754						
19	0.690						
10	0.660						
17	0.565	0.480					
12	0.535						
11	0.471						
15		0.697					
18		0.688					
16		0.671					
14		0.664					
21			0.809				
22			0.701				
23			0.671				
20			0.622				
8				0.754			
7				0.717			
9				0.635			
2					0.770		
1					0.737		
3					0.677		
5						0.761	
6						0.737	
4						0.477	
24							0.821
25							0.808

Note: Orthogonal rotation through Varimax method, with Kaiser normalization; items with load factor > 0.3; forced to 7 factors.

In the dimension "health promotion", nurses helped patients achieve their full health potential in these ways. They identified health situations of the population and the resources of the patient/family and community (M = 3.15; SD = 0.630); used the hospitalization time to promote healthy lifestyles (M = 3.26; SD = 0.685); and provided information that generates cognitive learning and new abilities of the patient (M = 3.30; SD = 0.611).

In the dimension "prevention of complications", the nurses, in their constant search of professional excellence, act towards prevention of complications for the patient. They identify potential problems of the patient as soon as possible (M = 3.44; SD = 0.546); prescribe and implement nursing interventions towards prevention of complications (M = 3.44; SD = 0.589); and evaluate whether these interventions have helped prevent problems or minimize undesirable effects (M = 3.40; SD = 0.637).

Table 2 – Dimensions and internal consistency for the scale of perception of nursing activities that contribute to nursing care quality. Portugal, 2015

Dimensions	Items	Cronbach's alpha
Patient satisfaction	1. Nurses show respect for the abilities, beliefs, values and desires of individual patient while providing nursing care. 2. Nurses are constantly seeking to show empathy in interactions with the patient (patient's family). 3. Nurses involve significant cohabitants of individual patient in the nursing care process.	0.744
Health promotion	4. Nurses identify the health situation of the population and the resources of patient/family and community. 5. Nurses use the hospitalization time to promote healthy lifestyles. 6. Nurses provide information that generates cognitive learning and new abilities in the patient.	0.740
Prevention of complications	7. Nurses identify potential problems of the patient. 8. Nurses prescribe and perform interventions to prevent complications. 9. Nurses evaluate the interventions that help prevent problems or minimize undesirable effects.	0.779
Well-being and self-care	14. Nurses identify patient's problems that will help improve the patient's well-being and daily activities. 15. Nurses prescribe and perform interventions that will help improve the patient's well-being and daily activities. 16. Nurses evaluate the interventions that help improve the patient's well-being and daily activities. 18. Nurses address problematic situations identified that will help improve the patient's well-being and daily activities.	0.862
Functional readaptation	20. Nurses ensure continuity of nursing service provision. 21. Nurses plan discharge of hospitalized patients in health institutions, according to each patient's needs and community resources. 22. Nurses optimize the abilities of the patient and his/her significant cohabitants to manage the prescribed therapy. 23. Nurses teach, instruct and train patients for their individual adaptation and teach, instruct and train patients on what is required for their functional readaptation.	0.830
Nursing care organization	24. Nurses know how to handle the nursing record system. 25. Nurses know the hospital's policies.	0.684
Responsibility and rigor	13. Nurses show responsibility for the decisions they make and for the acts they perform and delegate, aiming to prevent complications. 19. Nurses show responsibility for the decisions they make and for the acts they perform and delegate, aiming to ensure well-being and self-care of patients. 10. Nurses show technical/scientific rigor in the implementation of nursing interventions aiming to prevent complications 17. Nurses show technical/scientific rigor in the implementation of nursing interventions that help improve the patient's well-being and daily activities. 11. Nurses refer problematic situations to other professionals, according to the social mandates. 12. Nurses supervise the activities that support nursing interventions and the activities they delegate.	0.855
Cronbach's alpha – Total scale		0.940

In the dimension "well-being and self-care", the nurses identify the patient's problems that help improve the patient's well-being and daily activities (M = 3.44; SD = 0.571); prescribe and implement interventions (M = 3.39; SD = 0.620); and evaluate if such interventions help increase patient's well-being and daily activities (M = 3.32; SD = 0.633). Besides, the nurses address problematic situations to increase patient's well-being and daily activities (M = 3.37; SD = 0.605).

Regarding the dimension "functional readaptation", the nurses, along with the patients, are expected to develop effective processes of adaptation to health problems. To support that, the nurses promote continuity of nursing service provision (M = 3.45; SD = 0.614); plan the discharge of hospitalized patients according to their needs and community resources (M = 3.27; SD = 0.671); optimize the patient's abilities and significant cohabitants to manage the prescribed therapy (M = 3.31;

SD = 0.653); and teach, instruct and train patients on what is required for their functional readaptation (M = 3.38; SD = 0.638).

In the dimension "nursing care organization", the nurses know how to handle the nursing record system (M = 3.10; SD = 0.665) and are familiar with the hospital's policies (M = 2.99; SD = 0.666). Lastly, regarding the dimension "responsibility and rigor", the nurses show responsibility for the decisions they make and acts they perform and delegate responsibilities aiming to prevent complications (M = 3.62; SD = 0.532) and increase well-being and self-care (M = 3.62; SD = 0.548); they show technical/scientific rigor in the implementation of nursing interventions aiming to prevent complications (M = 3.41; SD = 0.593) and improve the patient's well-being and daily activities.(M = 3.41; SD = 0.588). They refer problematic situations to other professionals, according to the social mandates (M = 3.33; SD = 0.631); and supervise the activities that support nursing interventions and the activities they delegate (M = 3.31; SD = 0.615).

DISCUSSION

The scale originally applied presented 25 items, grouped in six dimensions. Later, considering the inherent theoretical reference to each dimension, the factor analysis and the internal consistency analysis of each factor/dimension, some changes were made in the scale composition, adding one more dimension to total seven factors, rather than the original six dimensions.

In this context, the structure of the final version for the scale of the perception of nursing activities that contribute to nursing care quality has seven dimensions: patient satisfaction (3 items), health promotion (3 items), prevention of complications (3 items), well-being and self-care (4 items), functional readaptation (4 items), nursing care organization (2 items) and responsibility and rigor (6 items).

The instrument presents an internal consistency evaluated through Cronbach's alpha coefficient of 0.94 for overall scale. It should be noted that Cronbach's alpha values above 0.70 are recommended to ensure internal consistency of a measurement [14], and only the dimension "nursing care organization" did not achieve this value, which can be justified by the reduced number of proposals that led to this result.

The results show that most nurses perform their activities in compliance with the quality standards, then compliant nursing practices are expected. However, it should be noted that, after the application of the scale, the activities from dimensions "health promotion" and "nursing care organization" were perceived by the nurses as activities with lower impact on improving care quality. Strategies of intervention and implementation should be developed to promote more attention to these dimensions, favoring a sustained adoption of them.

Regarding the demographic characteristics of nurses who participated in the study, consistent with the reality of nursing in Portugal, a significant predominance of female nurses (83.5%), mean age of 38.5 years, was observed.

Despite the methodological rigor used during the instrument development and validation, this study had a limitation, which is the fact that the scale was applied to only one hospital. This fact indicates that new empirical studies should be conducted, particularly in different contexts of clinical practice and using other types of analysis, such as the confirmatory factor analysis.

CONCLUSION

The scale of perception of nursing activities that contribute to nursing care quality (EPAECQC) was validated after its application to nurses from a hospital located in northern Portugal.

The findings of this study indicate the scale fulfills criteria of psychometric validity with high internal consistency. It is a promising instrument to measure the perception of nursing activities that contribute to nursing care quality, and can be used in other contexts of nursing practice.

In addition, this instrument can encourage nursing professions to adopt practices in compliance with the quality standards for nursing care.

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