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Instrument for assessing the quality of mobile emergency pre-hospital care: content validation*

Instrumento para avaliação da qualidade da assistência pré-hospitalar móvel de urgência: validação de conteúdo

Instrumento para evaluación de la calidad de la asistencia pre hospitalaria móvil de urgencia: validación de contenido

Rodrigo Assis Neves Dantas[1],Gilson de Vasconcelos Torres[2], Marina de Góes Salvetti[3], Daniele Vieira Dantas[4], Ana Elza Oliveira de Mendonça[5]

ABSTRACT

Objectives: To validate an instrument to assess quality of mobile emergency pre-hospital care. **Method:** A methodological study where 20 professionals gave their opinions on the items of the proposed instrument. The analysis was performed using Kappa test (K) and Content Validity Index (CVI), considering K> 0.80 and CVI ≥ 0.80. **Results:** Three items were excluded from the instrument: Professional Compensation; Job Satisfaction and Services Performed. Items that obtained adequate K and CVI indexes and remained in the instrument were: ambulance conservation status; physical structure; comfort in the ambulance; availability of material resources; user/staff safety; continuous learning; safety demonstrated by the team; access; welcoming; humanization; response time; costumer privacy; guidelines on care; relationship between professionals and costumers; opportunity for costumers to make complaints and multiprofessional conjunction/actuation. **Conclusion:** The instrument to assess quality of care has been validated and may contribute to the evaluation of pre-hospital care in mobile emergency services.

DESCRIPTORS

Emergency Nursing; Prehospital Care; Validation Studies.

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[1] Doctorate Professor, Nursing Department, Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil.

[2] Full Professor, Nursing Department, Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil.

[3] Doctorate Professor, Department of Medical-Surgical Nursing, School of Nursing, Universidade de São Paulo, Sao Paulo, SP, Brazil.

[4] Doctorate Professor, Nursing Department, Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil.

[5] Substitute Professor, Nursing Department, Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil.

Corresponding author:
Gilson de Vasconcelos Torres
Campus Universitário, BR 101 – Lagoa Nova
CEP 59078-970 – Natal, RN, Brazil
gilsonvtorres@hotmail.com

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INTRODUCTION

In Brazil the urgency and emergency sectors are identified as incapacitated and problematic areas within the health system, in which the decentralization, regionalization and hierarchy guidelines are insufficiently implemented[1].

In this context, the National Emergency Care Policy and consequently, the Mobile Emergency Care Services, were created in order to manage the health system, from the perspective of Pre-Hospital Care (PHC), organizing the network attention and structuring the national emergency services.

Considering that the Mobile Emergency Care Service is a regulatory complex health system that interferes with the organization of the care network and the structuring of emergency services, it is necessary to evaluate the quality of provision of these services, in order to propose solutions and improve their quality[2].

Evaluating something means to give it value regarding something specific, based on a judgment, through a specific method. On the other hand, the result evaluation intends to analyze the production of services provided, or to evaluate the actions provided to the population[3-4].

Regarding the assessment of health care, many services have been using evaluation methods based on the triad proposed by Donabedian: structure, process and outcome. In this approach, the structure relates to the human resources (staff), hospital buildings, financing, and equipment; the process comprises activities between patients and providers, based on standards; and the result is the final product of the care provided, in order to assess the health status and the satisfaction of standards and expectations[5-6].

In this study, only the evaluation of structure and process indicators were considered, since there are some difficulties in evaluating outcomes in the PHC area, as assessments should be performed by service users. The patient's stay inside the ambulance is short and it varies depending on the route taken to the health unit. Patient needs and maintenance of hemodynamic stability are priority, although patients are often unconscious and without a companion, compromising the collection of outcome data.

In Donabedian's theoretical framework, the opinion of health professionals working in the PHC mobile emergency allows for a systematic structure and process analysis of health care in these services, resulting in the assessment of quality of care from the view of these professionals[5].

The achievement of high quality work in the emergency area is dependent on interdisciplinary action, protocol adoption, specific knowledge, technical skill, coordination between different levels of the Unified Brazilian Health System and implementation of an internal quality policy[7-8].

Despite advances in emergency care in Brazil, services in this area, and particularly those of a public nature, remain burdened in precarious situations with human resources facing many obstacles in their work process. Studies on the pre-hospital quality care are scarce in Brazil, and there is no valid instruments for such evaluations[9].

The instrument of Quality Assessment on Pre-hospital Care (QA-PHC) was developed based on previous integrative review which sought to identify quality of care indicators in pre-hospital mobile emergency services. The integrative review study that formed the basis for the construction of the QA-PHC instrument is under consideration for publication in a scientific journal.

The objective of this study was to validate an instrument to evaluate the quality of mobile emergency pre-hospital care.

METHOD

This is a methodological study for content validation, carried out between the months of July and August 2012. Validation studies are performed to verify the quality of instruments, being the fundamental aspect for the legitimacy and credibility of search results. Content validation is the methodology that encompasses two distinct phases; the conceptual analysis that is based on the literature and the evaluation by experts or judges. This methodological approach indicates that the instrument actually reflects the purpose for which it is being used[10].

Content validity is accomplished by analyzing the items that compose the instrument. It is the determination of representativeness and extent to which each item of the measure proves the phenomenon of interest and the dimension of each item in what it proposes to investigate, performed by expert judges in the subject being investigated. This method assesses the extent to which the selected items measure a theoretical construct representing well all the important facets of the concept to be measured[10].

The study population was comprised of professionals working in PHC of Rio Grande do Norte, counted as 11 nurses and 24 doctors.

To calculate the sample and considering a sampling error of 10%, the following formula was used[11]:

$$n_0 = \frac{1}{E_0^2} \qquad n = \frac{N \cdot n_0}{N + n_0}$$

Where:
N = population size = 35
E_o = tolerable sampling error = (10% or 0.1)
n_o = first approximation of the sample size = 100
n = Sampling size = 25.9 or 26 subjects

Thus, the study sample should include 26 professionals in PHC of Rio Grande do Norte, hereinafter referred to as judges. The criteria for inclusion were: graduation in nursing or medicine, practice experience in PHC of at least one year, having published a study or a have a title (specialization, masters or doctorate) related to mobile emergency pre-hospital care services.

The selection of study participants was performed by accessibility, at the headquarters of the Mobile Emergency Care of Rio Grande do Norte. Among the 35 professionals of that service, only 20 met the inclusion criteria. They were then informed about the objectives of the study and invited to participate. All potential participants in the study

agreed to participate and signed duplicates of the Informed Consent and answered the questionnaires in a quiet and private place.

The study sample consisted of 20 professionals from the PHC mobile emergency care area in Rio Grande do Norte, who acted as judges, counting 10 nurses and 10 doctors. An instrument with two parts (personal and professional characteristics) was used for data collection; and another with the 20 proposed items to assess the quality of care in the pre-hospital mobile emergency service, called the instrument of Quality Assessment on Pre-hospital Care (QA-PHC).

The QA-PHC instrument was developed based on emergency pre-hospital care quality indicators identified by studies in the area[9,12-15]. The identification of quality indicators was carried out through an integrative literature review, guided by the following question: *What are the quality healthcare indicators used in studies analyzing mobile emergency pre-hospital services?*

The search of the studies took place through the following databases: LILACS (Index of Scientific And Technical Literature Of Latin America And The Caribbean) and MEDLINE (*Medical Literature Analysis and Retrieval System Online*), through the Virtual Health Library (VHL); *Web of Science* (*Thomson Scientific/ISI Web Services*); CINAHL (*Cumulative Index to Nursing and Allied Health*); PubMed; COCHRANE LIBRARY and EMBASE. Searches were also carried out in the Electronic Library SciELO (*Scientific Electronic Library Online*) and in the Digital Library of Theses and Dissertations, Universidade de São Paulo (USP).

The search resulted in the identification of 16 studies that met the following inclusion criteria: articles that used indicators of care evaluation in pre-hospital emergency services and articles related to the evaluation of healthcare assistance, available in Portuguese, English and/or Spanish in free full-versions published between January 2007 and June 2012 in the databases above; publications with only abstract available or those published in two or more databases were excluded.

Based on the literature search described above, it was possible to build the proposed items for the quality evaluation instrument of PHC emergency mobile services, which was then submitted to judges (Chart 1). Scale items were constructed to be answered in the form of the Likert scale, ranging from 1 to 5. The initial instructions informed the respondent that they must evaluate aspects of the structure and process of Mobile Emergency Care of Rio Grande do Norte, according to the qualification of the service, as to the following parameters: 1 = terrible, 2 = poor, 3 = regular, 4 = good, and 5 = excellent.

However, in this step of content validation the judges who participated in the study also assessed the items of the proposed instrument on relevance/permanence of each item through the following options: *Agree* (A) or *Disagree* (D), and if they agreed, they had to characterize it as an indicator of Structure (S) or Process (P).

Chart 1 – Initial composition of Quality Assessment on Pre-hospital Care (QA-PHC) instrument evaluated by specialists - Natal, RN, Brazil, 2012.

ITEMS	EVALUATION
Ambulance conservation status	Agree (A) or Disagree (D) If agreed: Structure (S) or Process (P)
Overall physical structure of service	
Comfort in the ambulance	
Availability of material resources	
Safety for ambulance users	
Safety for the professionals	
Continuous learning	
Response time	
Professional compensation	
Satisfaction of professionals and costumers receiving the service	
Access to service	
Welcoming	
Humanization	
Service provided	
Safety demonstrated by professional staff	
User privacy	
Guidelines on care	
Relationship between professionals and costumers	
Costumer opportunity to make complaints	
Multiprofessional articulation	

The evaluation of the instrument items occurred from the agreement or disagreement of the judges about the permanency/importance of the items. In addition, judges could propose suggestions to the items. Kappa index (K) was used to check the level of agreement and consistency (reliability) of judges' opinions; Content Validity Index (CVI) was used to assess agreement of the judges as to the representativeness of the measure in relation to the analyzed content.

Kappa index measures the proportion of agreement and varies from "minus 1" to "plus 1," with the closer to 1 being the better the level of agreement between observers. As acceptance criteria, a match > 0.80 was established which is considered as excellent/perfect between the judges, and with a 95% confidence interval. It is noteworthy that the classification of the Kappa index ranges as follows: 0.00 - poor; 0.00 to 0.20 – weak/slight; 0.21 to 0.40 - fair; 0.41 to 0.60 - moderate; 0.61 to 0.80 - substantial; 0.81 to 0.99 - excellent; and 1.00 - perfect[16-18].

CVI evaluates the analysis of the judges as to the representativeness of the instrument in relation to the analyzed content, and it is calculated by dividing the number of judges who agreed with the item by the total number of judges (CVI for each item). CVI ≥ 0.80 was considered consensus for a valid indicator item to be kept in the instrument[10].

The study followed the ethical principles contained in Resolution No. 466/12, and it was approved by the Research Ethics Committee of the Hospital Universitário Onofre Lopes, Universidade Federal do Rio Grande do Norte (HUOL/UFRN), under protocol N. 437/2010 and CAAE: 0025.0.294.051-10.

The collected data was organized in an electronic data sheet and then exported to statistical software. After coding and tabulation, data were analyzed using reflective reading

and using descriptive statistics with absolute and relative frequencies, and application of the Kappa test via the Online Kappa Calculator and CVI[19].

RESULTS

The presentation of results is organized as follows: personal and professional characteristics of judges in the study; followed by the levels of agreement, consistency and content validation of the proposed instrument according to the judges' opinions (Chart 2), and finally, the categorization of the instrument's items as structure or process according to the judges' evaluation (Charts 3 and 4).

The study judges were compose of 10 nurses (50.0%) and 10 physicians (50%). Most participants were 31-40 years old (60%), female (60%), with expertise in emergency care (80%), and 15% had master's degrees. As for the time of experience in pre-hospital emergency mobile services, 70% had between 5 and 9 years of experience.

Kappa and CVI values obtained for the items of the instrument for the quality of care in mobile emergency PHC are shown in Chart 2.

Chart 2 – Kappa indexes and CVI for the items of the Quality Assessment on Pre-Hospital Care (QA-PHC) instrument - Natal, RN, Brazil, 2012.

INDICATORS	KAPPA	CVI
Ambulance conservation status	1.00	1.00
Overall physical structure of service	1.00	1.00
Comfort in the ambulance	1.00	1.00
Availability of material resources	1.00	1.00
Safety for ambulance users	1.00	1.00
Safety for the professionals	1.00	1.00
Continuous learning	1.00	1.00
Response time	1.00	1.00
Professional compensation	**0.62**	0.90
Satisfaction of professionals and costumers receiving the service	**0.62**	0.90
Access to service	1.00	1.00
Welcoming	1.00	1.00
Humanization	1.00	1.00
Service provided	**0.80**	0.95
Safety demonstrated by professional staff	1.00	1.00
User privacy	1.00	1.00
Guidelines on care	1.00	1.00
Relationship between professionals and costumers	1.00	1.00
Costumer opportunity to make complaints	1.00	1.00
Multiprofessional articulation	1.00	1.00

According to Chart 2, most of the Kappa values and/or CVI obtained were greater than the established cut-off points, except for Professional compensation (K = 0.62), Job satisfaction (K = 0.62) and Service provided (K = 0.80), which had considerably substantial Kappa index but were below the limit (> 0.80) and therefore removed.

Kappa values obtained in the other items of the instrument indicate excellent agreement, consistency and validity of items. Analysis of CVI values obtained showed that all values were greater than 0.80, indicating excellent agreement among the judges as to the instrument items.

Charts 3 and 4 show the items that reached Kappa values and CVI above the regulatory limit and remained in the instrument, categorized by the judges as either related to structure or process.

As to the items of the instrument rated by judges as Process, involving the process of care in emergency between professionals and costumers, perfect indexes were obtained in the judges' evaluation through Kappa and CVI values obtained (Chart 4). Only the item Services provided (K = 0.80) was removed, so that nine items remained in the process category, as shown on Chart 4.

Chart 3 – Kappa indexes and CVI for items related to structure - Natal, RN, Brazil, 2012.

ITEMS RELATED TO STRUCTURE	KAPPA	CVI
Ambulance conservation status	1.00	1.00
Overall physical structure of service	1.00	1.00
Comfort in the ambulance	1.00	1.00
Availability of material resources	1.00	1.00
Safety for ambulance costumers	1.00	1.00
Safety for the professionals	1.00	1.00
Continuous learning	1.00	1.00
Safety demonstrated by professional staff	1.00	1.00

Chart 4 - Kappa indexes and CVI for items related to process - Natal, RN, Brazil, 2012.

ITEMS RELATED TO PROCESS	KAPPA	CVI
Access to service	1.00	1.00
Welcoming	1.00	1.00
Humanization	1.00	1.00
Response time	1.00	1.00
Costumers privacy	1.00	1.00
Guidelines on care	1.00	1.00
Relationship between professionals and costumers	1.00	1.00
Costumer opportunity to make complaints	1.00	1.00
Multiprofessional articulation	1.00	1.00

DISCUSSION

A study[20] conducted with 103 mobile emergency PHC services in the Netherlands showed that among physical characteristics, mechanical maintenance of the ambulance and availability of material resources, as well as safe accommodation of these items in the internal space provide greater safety to the service process, confirming the importance of some items proposed in the instrument.

The need to evaluate structural aspects in a pre-hospital service is also reinforced by studies that claim that comfort inside the ambulances and overall physical structure are important features that should be constantly evaluated,

since they influence the health stabilization dynamics of the patient who is in the ambulance[21].

The arrangement of spaces in an ambulance has a direct impact on the quality of care and patient safety. In addition, the safe storage of supplies and internal equipment affect the efficiency and the safety of providing primary care, as they may fall on the professionals, generating possible work injuries[22].

In the United Kingdom, research funded by the National Patient Safety Agency and Ambulance Service Association indicated that comfort/space/layout, and patient and professional safety are some indicators that should be part of an evaluation of satisfaction research, in order to raise levels of patient safety and the quality of care provided by ambulance services that treat patients with emergency needs, thereby confirming the importance of the structural items of the proposed instrument[22].

Keeping the item *Safety for the professional* in the instrument is related to urban violence rates in some cities. In this context, a study conducted in Brazil describes the insecurity of decentralized bases where ambulances are often found at several strategic points. Research has shown that one of the most stressful aspects of the service is patient care outside of a health facility, since working on public roads may implies risks[23].

There are reports that in the UK, 2-3% of incidents with PHC professionals were associated with violence and aggression, so teams should be prepared to contain violent patients and for the risk of armed robbery[22].

The item *Continuous education* is reinforced by an American study that recommends the development of a safety culture prepared for emergencies, confirming the need of planning specific internal education centers for continuing education of professionals working in emergency services[24].

These education centers should be responsible for the dissemination of information and updates in the emergency area, since the protocols are dynamic and are constantly reviewed, constructed and validated[24-26].

The item of *Safety demonstrated by professional staff* in providing care for the victim was also considered important by a Dutch study that indicated that safety of staff is directly related to the use of emergency care protocols[20].

The evaluation items of structure for Job satisfaction and Professional compensation did not obtain acceptable Kappa indexes and were removed from the instrument. Although these issues are relevant, not all judges considered these items essential to assess the Mobile Emergency Care Service structure.

It is the right of every citizen to receive quality public healthcare service. To ensure this right of access, and in order to spread a new culture of humane care, the Ministry of Health launched the National Humanization of Hospital Care Program in 2000. This program proposes a set of integrated actions aimed at changing the user to the standard of care in public health services in Brazil, improving the quality and effectiveness of care provided by these institutions[27].

The same authors emphasize that in 2004, the National Humanization of Hospital Care Program was replaced by a policy that runs through different actions and management levels of the Unified Brazilian Health System, constituting a public policy of assistance and not a specific program; the National Policy of Humanization. In this perspective, the process of humanizing refers to providing access, to receiving the patients with a risk rating in emergency situations (triage), privacy and guidelines on assistance and the state of costumer health, thereby confirming the importance of several proposed items of process in the instrument[27].

The importance of evaluating the *Response time* is confirmed by a study conducted in France by medical emergency pre-hospital service, which reported that one way to assess the effectiveness of these services is to count response time taken for the arrival of an ambulance to the place of occurrence after a call. This measure is an important performance indicator, since this can be directly related to patient survival[28].

The item of *Multiprofessional articulation* in an emergency mobile pre-hospital service is of paramount importance for synchronized execution of work process as a team. This indicator is recognized as a prerequisite for the quality of care[25,29].

The *Service provided* item obtained Kappa index of 0.80, considered substantial or good, but was removed from the instrument as it did not reach the established minimum ratio (0.81) to be considered acceptable. The fact that the *Service provided* item had Kappa index below the cut-off point can be related to the generic way of describing it. It is possible that a more specific description of the item could get a satisfactory Kappa index, which should be tested in future studies. However, studies that include the *Service provided* as a quality indicator were not found, which confirms the fragility of this item.

The *Relationship between professionals and costumers* item, and *Costumer opportunity to make complaints* were not found in studies that discuss the quality of pre-hospital services. However, these items were kept since Kappa and CVI had acceptable rates. Using the QA-PHC tool in the evaluation of mobile urgency and emergency services will allow for future adjustments and confirmation of the proposed structure. From the standpoint of content, its structure was confirmed.

This study has some limitations that should be mentioned: the QA-PHC instrument was initially developed for health professionals, with the goal of providing clear parameters to evaluate the quality of mobile emergency pre-hospital services. The QA-PHC has not been tested for use between costumers of pre-hospital care service, but this aspect can be explored in future studies. The QA-PHC only includes the categories of structure and process, proposed in the study[3], but the results of the evaluation is a very important step in assessing the quality and should be developed through new research.

Another limitation was the sample size, which did not reach the size recommended by the sample size calculation of 26 subjects. However, it is noteworthy that only 20 professionals of the study population met the inclusion criteria for the study, which perhaps could have been overcome with the addition of professionals from other pre-hospital care services, other states or the municipality. This limitation must be overcome in future studies.

CONCLUSION

It was possible to validate the instrument for assessing the quality of mobile emergency pre-hospital care (QA-PHC) by evaluating the structure and process of these services. Judges' contributions have improved/optimized the instrument. Kappa index and CVI of the items remaining in the instrument were considered excellent and the content has been validated with 17 items. Note that the content validation is an initial step in the validation process, which must be confirmed and improved in future studies with different populations and with costumers of the service.

The QA-PHC instrument can contribute to the evaluation of emergency mobile pre-hospital care services, by indicating weaknesses and allowing rearrangement of structure and process in order to improve the quality of care provided to the population.

RESUMO

Objetivos: Validar um instrumento de avaliação da qualidade da assistência pré-hospitalar móvel de urgência. **Método:** Estudo metodológico, com 20 profissionais que opinaram sobre os itens do instrumento proposto. A análise foi realizada por meio do teste Kappa (K) e Índice de Validade do Conteúdo (IVC), considerando K > 0,80 e IVC ≥ 0,80. **Resultados:** Três itens foram excluídos do instrumento: remuneração, satisfação profissional e atendimento realizado. Os itens que obtiveram índices K e IVC ótimos e permaneceram no instrumento foram: estado de conservação das ambulâncias; estrutura física; conforto da ambulância; recursos materiais; segurança do usuário/profissional; educação permanente; segurança demonstrada pela equipe; acesso; acolhimento; humanização; tempo resposta; privacidade ao usuário; orientações sobre o atendimento; relacionamento entre o profissional e usuário; oportunidade do usuário realizar reclamações e articulação multiprofissional. **Conclusão:** O instrumento de avaliação da qualidade da assistência foi validado e poderá contribuir para a avaliação de serviços pré-hospitalares móveis de urgência.

DESCRITORES

Enfermagem em Emergência; Assistência Pré-Hospitalar; Estudos de Validação.

RESUMEN

Objetivos: Validar un instrumento de evaluación de la calidad de la asistencia pre hospitalaria móvil de urgencia. El análisis fue llevado a cabo por medio de la prueba Kappa (K) e Índice de Validez de Contenido (IVC), considerando K > 0,80 e IVC ≥ 0,80. **Resultados:** Tres puntos fueron excluidos del instrumento: remuneración, satisfacción profesional y atención realizada. Los puntos que obtuvieron índices K e IVC óptimos y permanecieron en el instrumento fueron: estado de conservación de las ambulancias; estructura física; confort de la ambulancia; recursos materiales; seguridad del usuario/profesional; educación permanente; seguridad demostrada por el equipo; acceso; acogida; humanización; tiempo respuesta; privacidad al usuario; orientaciones acerca de la atención; relación entre el profesional y el usuario; oportunidad del usuario de hacer quejas y articulación multiprofesional. **Conclusión:** El instrumento de evaluación de la calidad de la asistencia fue validado y podrá contribuir con la evaluación de los servicios pre hospitalarios móviles de urgencia.

DESCRIPTORES

Enfermería de Urgencia; Atención Prehospitalaria; Estudios de Validación.

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