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Nursing care based on risk assessment and classification: agreement between nurses and the institutional protocol

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Objective: to verify the degree of agreement between the levels of priority given by baccalaureate nurses in care based on risk assessment and classification and the institutional protocol, and also among peers. Method: descriptive study, using a questionnaire with thirty fictitious clinical cases based on the institutional protocol, which is considered the gold standard, answered by twenty baccalaureate nurses. Results: the agreement analysis through the Kappa Coefficient concluded that the agreement between baccalaureate nurses and the institutional protocol in relation to prioritizing the levels of severity was moderate. When the agreement among peers was evaluated, it was low, as represented by the colorimetric density in shades of light gray. Conclusion: in Brazil, some institutions have developed their own protocol, which makes it necessary to develop tools in order to evaluate the accuracy of professionals in relation to the protocols, highlighting the need for capable people to perform this activity, thus contributing to patient safety.

Descriptors: Triage; Emergency Medical Services; Emergency Nursing.

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Introduction

The current situation of emergency services is a concern for the healthcare community and society. The demand for these services has been increasing in the last years due to the increasing number of accidents and urban violence⁽¹⁻²⁾. In addition to this demand, a large part of the care provided in these units results from low complexity diseases, which are referred to these services due to insufficient structure in primary healthcare services, which could be resolved in primary or specialized healthcare, or in emergency services for less complex cases⁽³⁾. As a consequence of this demand profile, the Emergency service is one of the main ports of entry to the healthcare system⁽³⁾.

The Brazilian healthcare system is composed of public and private service networks which, despite being distinct, are also related⁽⁴⁾. The public network is particularly composed of primary healthcare units (95%) and emergency services (65%), and the private network is composed of specialized healthcare services (74%) and hospital care (79%)⁽⁵⁾. The demand for low-complexity and emergency services by the lower income population suggests there is less access to appropriate care. This lack of access to specialized healthcare services and hospital care affects emergency care, which becomes the main form of access to specialized and technological medicine⁽³⁾. The lack of technology and diagnosis causes dissatisfaction with primary healthcare in the population, which seeks emergency services to receive medical consultations, exams and have access to the results on the same day⁽⁶⁾.

In Brazil, the Unified Health System (SUS) is composed of three care levels. The Primary Healthcare Units and the Family Healthcare Units are responsible for primary care, that is, health promotion and protection. The general hospitals and specialized clinics are aimed at providing early treatment and minimize health problems, and are classified as secondary care. In the scope of tertiary care, there are more complex and rehabilitation actions that are provided by specialized hospitals⁽⁴⁾.

The problem-solving ability of the care depends on the integration among the three care levels and, when this does not occur, there is an overload of the healthcare network, negatively affecting patient care⁽⁵⁾.

In this context, in 2004, the QualiSUS program was created, which established a set of measures aimed at providing greater comfort to patients, with care provided according to the degree of risk, more effective care delivery by the healthcare professionals

and shorter hospital stay. One of the foundations of the program is the humanization of the relationship among professionals, healthcare system and patients. In this context, another measure created by SUS was the development of the National Humanization Policy (PNH), also known as HumanizaSUS, which uses tools and devices that can effectively strengthen the guarantees of comprehensive, problem-solving and humanized care; within these, the guideline care based on risk assessment and classification (AACR) can be highlighted as one potentially decisive interventions in reorganizing and promoting health in the network⁽⁷⁻⁸⁾.

The implementation of AACR for care delivery by level of severity instead of order of arrival at the Emergency Services was the strategy used to achieve the principle of the PNH and it was implemented under a pre-established protocol, providing care focused on the level of complexity⁽⁸⁻⁹⁾.

The AACR is a dynamic identification process of patients who need immediate treatment, based on the risk potential, health injury or degree of pain. This practice is seen as an ethical and professional position for care delivery by level of complexity⁽⁸⁻⁹⁾.

Historically, in the United States of America, the term triage was initially used by the military to classify soldiers who were wounded in battle in order to establish treatment priorities⁽¹⁰⁾. Physicians and nurses who had experience with effective triage processes in the battlefield introduced this technology to civil emergencies with great success. However, the term risk classification is different from the term triage, which involves the patient selection technique⁽⁸⁻⁹⁾.

The recommendations for the use of the AACR protocol are done through scales and protocols, which divide the risk into five levels that present higher trustworthiness, validity and reliability levels in the assessment of patients' current conditions. The most used scales or protocols recognized worldwide are: *Emergency Severity Index (ESI)*, *Australian Triage Scale (ATS)*, *Canadian Triage Acuity Scale (CTAS®)* and *Manchester Triage System (MTS)*⁽¹¹⁻¹²⁾.

Decree 2048/2002, which regulates Urgency and Emergency services in Brazil, suggests the implementation of care and "risk classification triage" at emergency care units. This process should be performed by a senior healthcare professional who has received specific training, using pre-established protocols to evaluate the degree of urgency in relation to patients' complaints and prioritize for care delivery⁽²⁾. According to the PNH booklet, the AACR should be performed by

baccalaureate nurses who need to be trained to perform this task⁽⁸⁾. The professional practice law also endorses them to perform this task, since nursing consultation and prescription are activities that are specific to nurses, and risk classification is part of the nursing consultation. In 2009, the Sao Paulo Regional Nursing Council clarified that the AACR process is an activity that is consistent with the duties of a nurse, since it is considered a working strategy that involves changes which will meet the needs of the assisted population, the professionals and the institutions committed to human health⁽¹³⁾.

In Brazil, some hospitals were the first to implement the AACR protocols based on international protocols. The first to make use of these protocols was the Paulinia Local Hospital in 1993, which adapted the Canadian protocol to the local situation⁽¹¹⁾. Another national service that used the Canadian protocol was the Mario Gatti Hospital in Campinas⁽¹⁰⁾.

The Odilon Behrens Hospital (HOB), located in Belo Horizonte, was used as a model for other hospitals, as it implemented the AACR through its own protocol, based on the Manchester Triage System⁽¹⁴⁾.

The AACR implementation in Brazilian hospitals is similar to the initiatives seen in other countries; however, some peculiarities are noted in this process, depending on the reality of these institutions⁽¹¹⁾.

Therefore, in the face of the growing demand for emergency services, after the AACR implementation as an SUS policy and taking into consideration that the severity assessment guidelines for patients' conditions are defined in protocols, the agreement between the professional's assessment and the institutional protocol is essential to ensure the safety of the assisted population. In this context, the objective of this study was to verify the degree of agreement between the levels of priority given by the baccalaureate nurses in care delivery based on risk assessment and classification and the institutional protocol, and also among peers.

Methods

This is a descriptive study, which was carried out in the period from August to September 2011, in the Emergency Department of Sao Paulo Hospital, a public entity affiliated with a university and a highly complex institution located in the South of Sao Paulo city, providing care to 700 patients a day. The population assisted at the service is mainly composed of adult patients who use the SUS.

In this unit, the AACR was implemented in 2009 with a protocol developed by physicians and nurses working at the Emergency Services and based on the HumanizaSUS project of the Ministry of Health.

The development of the institutional protocol was based on the main complaint, and had the signs and symptoms as guides to conduct the case, since they suggest the level of care priority to the healthcare professionals. The division of the risk into five distinct levels was done in colors for the sake of easy visualization: red, orange, yellow, green and blue; each color represents a level of severity and a maximum waiting period for patients to be assisted by a physician. The red color indicates an emergency and medical care should be provided immediately; orange color is very urgent and it is recommended that patients wait for 10 minutes at most; yellow means urgent and the recommended waiting period is sixty minutes; green is considered a little urgent and blue not urgent, with waiting periods of two and four hours, respectively.

Two years after the implementation of the AACR, there was a need to evaluate the quality of nursing care, due to these professionals' turnover history in the department and the lack of formal training. As a consequence, an instrument was developed which aimed to verify the agreement between the levels of priority given by the baccalaureate nurses and the institutional protocol, as well as the uniformity of the classification among these professionals.

The instrument was based on signs and symptoms related to the main complaint, as described in the institutional protocol, which was considered the gold standard. The questionnaire was composed of 30 cases, which addressed the most frequent medical conditions: diabetic imbalance, chest pain, hypertensive crisis, hemorrhage, among others, as below:

Institutional protocol - orange classification: diabetes complications, capillary glucose <10 mg/dl and >600 mg/dl, sweating, no alteration in psychological state, blurred vision, fever, vomiting, tachypnea and tachycardia.

Corresponding case - Woman, 45 years old, diabetic using insulin, reports intense sweating for 6 hours. Denies blurred vision or vomiting. PA: 100/60 mmHg, FC: 86 bpm, FR:21 ipm, capillary glucose: >600mg/dl

After reading the case, nurses would have to assign a priority level according to the institutional protocol.

Twenty-seven baccalaureate nurses are responsible for putting the AACR in practice and, from these, all professionals who were working at the time of data

collection were included in the study sample, totaling 20 professionals. Nurses who were on vacation, strike, medical or parental leave were excluded from the study. The study received approval from the Research Ethics Committee at the Federal University of Sao Paulo under number 0445/11 and the participants were included after signing the Informed Consent Form.

The data were stored in Windows Excel, and STATA® software version 11 was used for processing and statistical analysis.

The demographic characteristics were analyzed descriptively. Risk rating is an ordinal categorical variable. Therefore, the Kappa Coefficient was calculated to analyze the agreement among evaluators and between each evaluator and the institutional protocol, with a 95% confidence interval (CI).

The Kappa Coefficient evaluates the degree of agreement beyond what would be expected solely by chance. This measure of agreement uses a scale in which 1 means total agreement and values close to or below 0 indicate no agreement. A possible Kappa value below 0, that is, negative, suggests that the agreement

was lower than what would be expected by chance. It therefore suggests disagreement, without the possibility to interpret its intensity⁽¹⁵⁾.

In this study, Kappa values below zero indicated no agreement, between 0 and 0.20 poor agreement, between 0.21 and 0.40 low agreement, between 0.41 and 0.60 moderate agreement, between 0.61 and 0.80 substantial agreement and between 0.81 and 1.00 almost perfect agreement⁽¹⁵⁾.

Results

Twenty baccalaureate nurses participated in this study, 90% of whom were female with an average age of 27.3. The average graduation time was 34 months and 50% completed a post-graduate degree in urgency and emergency area. The average length of experience in risk classification was 22.6 months.

Figure 1 shows the degree of agreement between the nurses and the institutional protocol concerning the levels of priority, showing that most professionals presented moderate agreement.

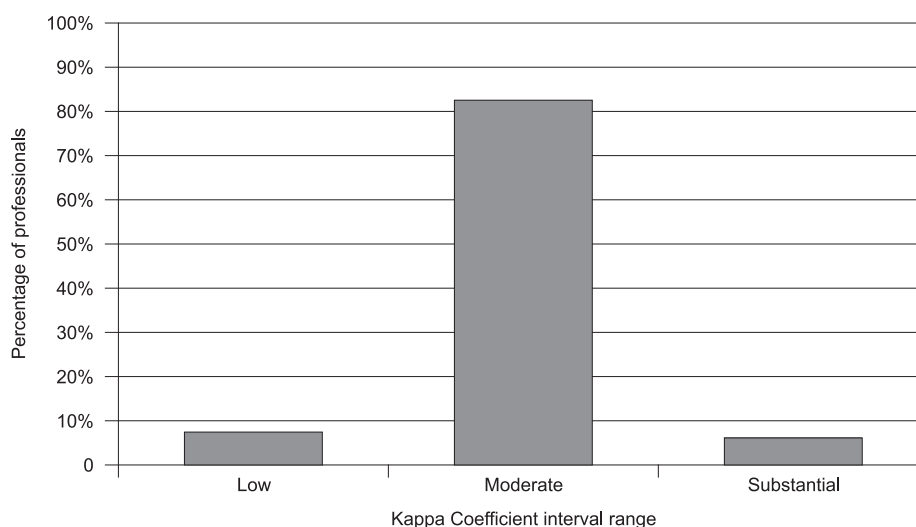


Figure 1 – Degree of agreement between the nurses and the institutional protocol concerning the levels of priority. São Paulo, Brazil, 2012

Figure 2 shows the percentage of agreement among the nurses concerning the resolution of cases. The agreement between peers can be better visualized through colorimetric density, in which low agreement

among professionals can be noted, as shown by the various tones of light gray. The darker gray tones show greater agreement among professionals.

	Nurse A	Nurse B	Nurse C	Nurse D	Nurse E	Nurse F	Nurse G	Nurse H	Nurse I	Nurse J	Nurse K	Nurse L	Nurse M	Nurse N	Nurse O	Nurse P	Nurse Q	Nurse R	Nurse S	Nurse T
Nurse A		37.5	56.3	65.6	56.3	65.6	50.0	59.4	75.0	59.4	59.4	65.6	40.6	53.1	53.1	56.3	59.4	56.3	50.0	68.8
Nurse B	37.5		56.3	53.1	62.5	53.1	50.0	59.4	37.5	53.1	53.1	40.6	53.1	46.9	46.9	43.8	53.1	50.0	56.3	56.3
Nurse C	56.3	56.3		59.4	68.8	53.1	62.5	71.9	50.0	71.9	53.1	46.9	59.4	59.4	53.1	75.0	59.4	68.8	50.0	62.5
Nurse D	65.6	53.1	59.4		71.9	68.8	53.1	68.8	71.9	75.0	62.5	75.0	62.5	50.0	62.5	59.4	75.0	71.9	71.9	59.4
Nurse E	56.3	62.5	68.8	71.9		53.1	62.5	78.1	56.3	65.6	65.6	53.1	53.1	59.4	71.9	62.5	59.4	56.3	62.5	56.3
Nurse F	65.6	53.1	53.1	68.8	53.1		65.6	68.8	65.6	56.3	56.3	62.5	62.5	62.5	50.0	65.6	75.0	59.4	59.4	59.4
Nurse G	50.0	50.0	62.5	53.1	62.5	65.6		71.9	62.5	65.6	59.4	59.4	65.6	65.6	59.4	62.5	65.6	68.8	68.8	56.3
Nurse H	59.4	59.4	71.9	68.8	78.1	68.8	71.9		59.4	68.8	75.0	50.0	62.5	62.5	56.3	65.6	62.5	71.9	65.6	59.4
Nurse I	75.0	37.5	50.0	71.9	56.3	65.6	62.5	59.4		65.6	53.1	71.9	59.4	65.6	59.4	56.3	65.6	62.5	75.0	62.5
Nurse J	59.4	53.1	71.9	75.0	65.6	56.3	65.6	68.8	65.6		62.5	68.8	68.8	68.8	56.3	65.6	81.3	65.6	71.9	65.6
Nurse K	59.4	53.1	53.1	62.5	65.6	56.3	59.4	75.0	53.1	62.5		50.0	56.3	62.5	68.8	46.9	56.3	59.4	59.4	65.6
Nurse L	65.6	40.6	46.9	75.0	53.1	62.5	59.4	50.0	71.9	68.8	50.0		62.5	56.3	62.5	59.4	68.8	65.6	71.9	65.6
Nurse M	40.6	53.1	59.4	62.5	53.1	62.5	65.6	62.5	59.4	68.8	56.3	62.5		50.0	62.5	59.4	75.0	65.6	65.6	46.9
Nurse N	53.1	46.9	59.4	50.0	59.4	62.5	65.6	62.5	65.6	68.8	62.5	56.3	50.0		62.5	65.6	68.8	53.1	59.4	59.4
Nurse O	53.1	46.9	53.1	62.5	71.9	50.0	59.4	56.3	59.4	56.3	68.8	62.5	62.5	62.5		53.1	62.5	59.4	59.4	53.1
Nurse P	56.3	43.8	75.0	59.4	62.5	65.6	62.5	65.6	56.3	65.6	46.9	59.4	59.4	65.6	53.1		71.9	62.5	50.0	62.5
Nurse Q	59.4	53.1	59.4	75.0	59.4	75.0	65.6	62.5	65.6	81.3	56.3	68.8	75.0	68.8	62.5	71.9		59.4	65.6	59.4
Nurse R	56.3	50.0	68.8	71.9	56.3	59.4	68.8	71.9	62.5	65.6	59.4	65.6	65.6	53.1	59.4	62.5	59.4		68.8	56.3
Nurse S	50.0	56.3	50.0	71.9	62.5	59.4	68.8	65.6	75.0	71.9	59.4	71.9	65.6	59.4	59.4	50.0	65.6	68.8		56.3
Nurse T	68.8	56.3	62.5	59.4	56.3	59.4	56.3	59.4	62.5	65.6	65.6	65.6	46.9	59.4	53.1	62.5	59.4	56.3	56.3	

Figure 2 – Percentage of agreement among nurses concerning the evaluation of priority levels. São Paulo, Brazil, 2012

Discussion

Despite the existence of AACR implementation protocols, there are only a few studies related to the topic, especially within the national context. The AACR in Brazilian hospitals is similar to projects implemented in other countries, but with some peculiarities according to the reality of institutions, and the verification of agreement between the nurses' evaluation and the protocols is essential with a view to patient safety⁽¹¹⁾.

It was noted in this study that the agreement between the nurses and the institutional protocol concerning the levels of priority was moderate (Kappa=0.41-0.60).

In a study carried out in Australia in 2009, aimed at verifying the agreement between the levels of severity given and the Manchester protocol by way of a case study, the Kappa values found varied between 0.40 and 0.80, with an average of 0.63, showing substantial agreement⁽¹⁶⁾.

A Brazilian study carried out in 2008 to investigate nurses' accuracy in risk assessment and classification established in the institutional protocol of a local hospital in Belo Horizonte, in the state of Minas Gerais, through the verification of records on the admission form, showed poor to reasonable agreement between the levels of classification (Kappa=0.36). The results also pointed towards a trend, among nurses, to classify

patients with lower risk degrees than those established by the institutional protocol. In contrast, a trend to overestimate risk is noted in some cases, which can determine an overload of emergency services caused by an increasing demand for care⁽¹⁷⁾.

In this study, the agreement concerning the levels of priority among the nurses was moderate to substantial. An international study published in 2005 identified moderate to good agreement among the nurses who undertook the triage according to the local protocol. This study arouses reflections about patient safety related to this care, since risk classification is a daily duty of the nurses working in urgency and emergency units⁽¹⁸⁾.

Some authors consider that the act of classifying patients requires a set of conditions and actions that support the evaluation of their complexity degree⁽¹⁹⁻²⁰⁾. Evaluation and classification with care prioritization depend on proficiencies like the ability to assess the conditions based on the patients' main complaint⁽²⁰⁾.

The national studies about risk classification still do not present an extensive approach of the agreement among nurses, and the majority of them provide an analysis of the profile of the care population and their complaints⁽²¹⁻²²⁾. It is believed that nurses are capable of providing care with risk assessment and classification; however, they need to be trained in this activity, since this is not part of their formal qualification.

Study limitations include its development at only one unit, the reduced number of nurses and the use of a protocol developed within the institution, which makes any comparison with other studies difficult.

Some studies have sought to evaluate the agreement among professionals who perform risk classification; however, there are difficulties to develop research in real-world scenarios. Therefore, an alternative was to create scenarios that were similar to institutional realities.

Conclusion

Classification is a complex activity that depends on the skills and abilities of nurses, besides external factors like the workplace environment.

In this study, the agreement concerning the degree of prioritization of the levels of severity between the nurses and the institutional protocol was mostly moderate.

The agreement among peers was low when visualized in the colorimetric density, and this can be noted through the various tones of light gray.

In Brazil, some institutions developed their own protocols, which makes it essential to develop tools to evaluate the professionals' accuracy in relation to the protocols, highlighting the need for training for this activity, thus contributing to patient safety.

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