ORIGINAL ARTICLE

Pediatric Patient Classification System: construction and validation of care categories*

SISTEMA DE CLASSIFICAÇÃO DE PACIENTES PEDIÁTRICOS: CONSTRUÇÃO E VALIDAÇÃO DE CATEGORIAS DE CUIDADOS

SISTEMA DE CLASIFICACIÓN DE PACIENTES PEDIÁTRICOS: CONSTRUCCIÓN Y VALIDACIÓN DE CATEGORÍAS DE ATENCIÓN

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ABSTRACT

Patient classification is essential for managing a hospital unit. Literature, however, does not present conceptualizations of pediatric patient categories. The objectives of this study were to define and validate pediatric patient care categories, according to the level of dependency of the nursing team. The care categories were defined based on a literature review, and the content of the proposed categories was validated by a group of judges involved in managing and providing care in a pediatric unit, and by judges involved in pediatric education and research as well as in the construction of patient instruments. Five care categories were established and validated: Minimal, Intermediate, High dependency, Semi-intensive and Intensive. The validation of the care categories were the basis for constructing a system for the classification of pediatric patients, that may contribute with the decision making process of nurses working in management and health care.

DESCRIPTORS

Pediatrics nursing
Workload
Nursing assessment
Classification
Validation studies

RESUMO

A classificação de pacientes é essencial para o gerenciamento de uma unidade. Entretanto, a literatura não dispõe de conceituações de categorias de pacientes pediátricos. Os objetivos deste estudo foram definir e validar categorias de cuidado de pacientes pediátricos, de acordo com o grau de dependência da equipe de enfermagem. Utilizou-se revisão bibliográfica para definição das categorias de cuidado e a validação de conteúdo das categorias propostas foi realizada por um grupo de juízes envolvidos em assistência e gerência de unidades pediátricas e por juízes envolvidos em ensino e pesquisa de pediatria e construção de instrumentos de classificação de pacientes. Foram estabelecidas e validadas cinco categorias de cuidados: Mínimos, Intermediários, Alta dependência, Semi-intensivo e Intensivo. A validação das categorias de cuidado subsidiou a construção de um sistema de classificação de pacientes pediátricos que poderá contribuir para o processo de tomada de decisão do enfermeiro na prática gerencial e assistencial.

DESCRITORES

Enfermagem pediátrica
Carga de trabalho
Avaliação em enfermagem
Classificação
Estudos de validação

RESUMEN

La clasificación de pacientes es esencial para el gerenciamiento de una unidad. Sin embargo, la literatura no dispone de conceptualizaciones de categorías de pacientes pediátricos. Este estudio objetivó definir y validar categorías de atención de pacientes pediátricos, de acuerdo con grado de dependencia del equipo de enfermería. Se utilizó revisión bibliográfica para definición de categorías de atención y la validación de las categorías propuestas fue efectuada por un grupo de jueces involucrados en atención y gerenciamiento de unidades pediátricas, y por jueces identificados con enseñanza e investigación en pediatría y construcción de instrumentos de clasificación de pacientes. Se establecieron y validaron cinco categorías de atención: Mínimos, Intermedios, Alta Dependencia, Semi-intensivo e Intensivo. La validación de categorías de atención ayudó a construir un sistema de clasificación de pacientes pediátricos que podrá contribuir al proceso de toma de decisiones del enfermero en la práctica gerencial y asistencial.

DESCRIPTORES

Enfermería pediátrica
Carga de trabajo
Evaluación en enfermería
Clasificación
Estudios de validación

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INTRODUCTION

The main objective of health services is to produce a positive impact on the health condition of the population. Analysis is required for issues such as demand, supply and quality of services to organize these services to that end[1]. The quality of health services is determined by a set of characteristics concerning the structure, work process, and results of actions implemented to improve the health of patients[2]. Health services with appropriate structures such as physical area, human resources and appropriate material, provide favorable conditions for the delivery of quality care. Nursing services play an essential role in the care process and managing human resources should receive special attention in the analysis of health services supply in order to balance issues such as cost, efficiency and quality of care[3].

The quantitative and qualitative aspects of human resources in nursing are directly linked to the quality of care offered to patients. Hence, these require special attention from managers since inappropriate proportions of such resources negatively reflects on care delivery[4]. Personnel assignment is a systematic process that grounds the planning and evaluation of the quantitative and qualitative aspects of the nursing staff, required to provide care and ensure its previously established quality, to a set of patients according to the philosophy, uniqueness and structure of each service[5]. One is required to make a diagnosis of the situation of each unit or service in order to apportion the nursing staff. This diagnosis involves the characterization of clientele, the philosophy, objectives and care proposal of each facility[5-8].

We stress that knowledge of the number of beds or the percentage of occupied beds are not the only safe indicators to quantify the care demands of a hospitalization unit[9-11] but also that the characterization of the clientele is not reduced to an isolated analysis of epidemiological data such as age, gender, and medical diagnosis. Care demand comprehends the evaluation of duration of care, the patient's degree of dependence when performing activities of daily living, and the disease's complexity and severity[6].

In this context, the use of a Patient Classification System (PCS) permits estimating, quantifying, and evaluating the demand for nursing care by groups of patients, categorizing them according to care needs in a specific period of time[9-11]. The use of PCS enables one to base the apportioning and distribution of personnel, as well supports the planning and forecasting of costs, taking into account the achievement of quality care standards[11], because it allows the characterization of the clientele, discriminating the different categories of care actions according to the patients' degree of dependence on the nursing team.

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Based on a national study[7], the Brazilian Nursing Council[8] established official parameters to apportion nursing resources according to the distribution of categories of care actions to indicate the minimum number of nursing professionals required as well as the percentage of distribution by profession[8]. However, the conceptualizations established for the categories of care actions in the mentioned study[7] are not appropriate for the context of pediatrics because these do not take into account the need of pediatric patients. Hence, due to this gap of specific conceptualizations in the literature, the pediatric field faces difficulties grounding its scaling of personnel.

Given this context, studies conceptualizing the categories of care actions in pediatrics are needed.

OBJECTIVES

To construct and validate the conceptualization of care categories for Pediatric Nursing clientele that discriminate different groups of patients in relation to their needs of nursing care.

METHOD

This methodological study aimed to transform intangible constructs, such as phenomena related to interest in nursing research and practice, into tangible constructs. The procedures for this type of study depend on the use of the construct, though a literature review and evaluation of validity are indispensable[12].

The first phase of the study included the design of categories of care actions based on a bibliographic study of childhood development and existing conceptualizations for adult patients. The second phase involved the evaluation of content validity of the conceptualizations of care actions, which consists of verifying the degree of correlation between a given concept and its future measure[12]. In this study, it consisted of verifying whether the care categories discriminate groups of patients with common characteristics in relation to their needs in regard to nursing care.

The Delphi technique was used to evaluate content validity. This technique consists of the judgment of a panel of experts in the field through questionnaires. After all the judges provide their answers, grouping and detailed analysis of opinions to refine the initial idea is performed, and then a new phase of questioning is carried out with the same judges. Various phases of questioning may be accomplished, followed by changes in the construct in order to improve it until consensus is reached among the judges. This technique is characterized by its flexibility, where the researcher responsible for the study establishes the rules regarding the number of phases, number of experts and level of consensus required to consider the construct valid[12-14].

The conceptualization of care categories was submitted to a panel of judges composed of nurses who teach, research, and manage or provide direct care to pediatric patients, or have knowledge in the field of patient classification. Thus, the analysis of the dependence of children was possible from different perspectives and participants contributed from both academic and professional practice in the direct care of patients. The following inclusion criteria were used: nurse experts in pediatrics or with a minimum experience of five years in the field and professors from the pediatrics field or with studies focused on the classification of patients.

After consenting to be in the study, the judges received specifically written instructions concerning the study's objectives and how to evaluate the constructs through an instrument developed for the analysis of the proposed conceptualizations. Each of the definitions of the care categories is analyzed concerning its clarity and agreement. The judges were also asked to provide suggestions to improve the conceptualizations. Agreement greater than two thirds of the panel of judges would be representative to consider the conceptualizations valid. Therefore, a level of agreement of 70% was adopted both in relation to the care categories' definition and clarity of writing.

The project was submitted to and approved by the Research Ethics Committee of the Federal University of Campinas, Faculty of Medical Sciences (nº 533/2005).

RESULTS

The first version of the conceptualization of care categories for pediatric patients composed of five categories was based on concepts available in the literature on patients classification systems[6-12] and child development[15-17]. Each category was described according to the different age ranges and are presented as follows:

• Minimum Care**:**

Infant or toddler, stable from a clinical and nursing point of view, accompanied full time by the mother or legal guardian, who performs feeding and hygiene activities and provides comfort to the child regardless of nursing service.

Preschooler or school age child, stable from a clinical and nursing point of view, accompanied full time by a trusted person, who participates in the child's self-care actions, regardless of the nursing team.

Adolescent, stable from a clinical and nursing point of view, having or not having a companion full time, collaborates in treatment and performs self-care actions under the supervision of a nurse.

• Intermediate care:

Infant or toddler, stable from a clinical and nursing point of view, accompanied full time by a mother or legal guardian, who performs feeding and hygiene activities and provides comfort to the child, but requires guidance from nurses to perform such activities.

Preschooler or school age child, stable from a clinical and nursing point of view, accompanied full time by a trusted person, who performs self-care actions jointly with the child, but requires guidance from nurses to perform such activities.

Adolescent, stable from a clinical and nursing point of view, having or not having a companion full time, collaborates in treatment and performs self-care actions, but requires guidance from nurses to perform such activities.

• High Dependence Care:

Infant, toddler, preschooler, or school aged child, stable from a clinical and nursing point of view, may or may not have a chronic pathology, who even with a companion full time requires help eating, accomplishing hygiene and comfort activities and/or other specific nursing care.

Adolescent, stable from a clinical and nursing point of view, may or may not have a chronic pathology, who regardless of a companion, is not able to collaborate with treatment and/or requires help eating, performing hygiene and comfort activities or other specific nursing care.

• Semi-Intensive Care:

Pediatric patient (newborn, infant, preschooler, school age child or adolescent) subject to unstable vital signs or glycemic levels, without imminent risk of death, who regardless of a companion, requires continuing and specialized nursing and medical care.

• Intensive Care:

Pediatric patient (newborn, infant, preschooler, school age child or adolescent) in a severe condition, subject to unstable vital signs, with imminent risk of death and requires continuing and specialized nursing and medical care.

To validate the content of care categories, the conceptualizations proposed were assessed by ten judges, all nurses, aged between 26 and 48 years of age with five to 23 years experience after graduation. In relation to the fields of professional practice, one of them works in direct care, four in the management of pediatric care units, two teach courses in pediatrics, two teach and research in the field of pediatrics, and one teaches in the field of nursing administration with research focused on patient classification systems and nursing management. Three are specialists, four have master's degrees and three have doctorate degrees. Seven judges performed the first evaluation and results are presented in Table 1.

Table 1 - Evaluation of conceptualizations of care categories in pediatrics in relation to agreement and clarity, first stage - Campinas, SP, Brazil - 2006

Categories of care	Agreement		Clarity	
	N	%	N	%
Minimum care				
Newborn, infant	2	29	4	57
Preschooler/school age child	3	43	4	57
Adolescent	5	71	5	71
Intermediate				
Infant/ Toddler	4	57	3	43
Preschooler/ school age child	4	57	3	43
Adolescent	5	71	4	57
High Dependence				
Infant/Toddler/ Preschooler/school age child	5	71	4	57
Adolescent	5	71	4	57
Semi intensive	5	71	5	71
Intensive	5	71	5	71

Score: (N= 7)

The evaluation of the first stage of the Delphi technique resulted in a level of agreement below 70% in the categories *Minimum and Intermediate Care for*: newborns, infants, preschoolers, school age children. Results in relation to clarity were likewise for all the categories except *Semi-intensive and Intensive Care*, whose level (71%) of agreement and clarity was close to the level established for this study.

Asserting the need for many reformulations in the conceptualization and given the importance of the theme, three judges opted for not answering the instrument completely and made themselves available to meet with one of the researchers to more deeply discuss the taxonomy of the complexity of care delivered to pediatric patients.

Given the results obtained in the first stage of the Delphi technique, the researchers adopted all the suggestions of the judges. Between the first and the second stages, two meetings were held: the first with the first judge and the second with the other two judges in the format of a workshop in which the concepts were re-elaborated and which are presented as follows:

• *Minimum Care:* Pediatric patient older than 12 years old, development appropriate to age, stable from a clinical point of view, who performs all self-care actions under the supervision of the nursing staff.

• *Intermediate Care:* Pediatric patient older than seven years of age, development appropriate to age, stable from a clinical and nursing point of view, who requires help from the nursing staff to perform self-care and/or support to cope with the disease and hospitalization.

• *High Dependence Care:* Pediatric patient (any age), stable from a clinical point of view, who depends on the nursing staff to meet his/her organic/physical, emotional and social needs.

• *Semi-Intensive Care:* Pediatric patient (any age), stable from a clinical point of view, without imminent risk of death, who requires continuing and specialized nursing and medical care.

• *Intensive Care:* Pediatric patient (any age), stable from a clinical point of view, with imminent risk of death, who requires continuing and specialized nursing and medical care.

The reformulated conceptualizations were submitted to the remaining eight judges who did not participate in the second meeting, who were asked to evaluate once again the conceptualization and clarity through a new questionnaire.

Eight questionnaires were sent, from which seven (87.5%) returned. All the care categories obtained excellent agreement (from 85 to 100%), both in terms of conceptualization and clarity, ensuring their content validity. Additionally, we consider 100% of agreement to have been obtained from the two judges who participated in the workshop of conceptualizations (Table 2).

Table 2 - Evaluation of conceptualizations of care categories in pediatrics in relation to agreement and clarity, second stage - Campinas, SP, Brazil - 2006.

Care categories	Agreement		Clarity	
	N	%	N	%
Minimum	6	86	6	86
Intermediate	6	86	6	86
High dependence	6	86	6	86
Semi-intensive	7	100	7	100
Intensive	7	100	7	100

Score: (N= 7)

DISCUSSION

Only the description of the properties of instruments of patients' classifications and their applicability are found in the international literature[6,9-11]; there are no explicit concepts of care categories. The concepts found in the Brazilian literature concerning care categories for adult patients are not appropriate for pediatric patients. They do not consider care required by pediatric patients in different age ranges, which are determinants in relation to the degree of complexity or severity of the disease for which pediatric patients are hospitalized[7].

The judges agreed with the care categories proposed, which are similar to those used to classify adults[7]. However, the judges disagreed in relation to the conceptualization according to age range for each care category because these categories are not appropriate for pediatric patients since they did not consider specific characteristics of child development and care required in each age range.

In the first stage of the evaluation, the judges stressed that the assumption that the patient's companion would be responsible for providing care for the hospitalized pa-

tient was unacceptable, as was including infants, preschoolers, and school age children in the category *Minimum Care*.

The opinion of the panel of judges is consonant with the literature concerning the delivery of care by family caregivers. The patients' family members can perform many care actions as long as they are willing to and feel capable to do it. Care actions, however, are the full responsibility of nurses during the period of hospitalization.

The decision to conceptualize the category *High Dependency* was considered a wise decision because this category is closely linked to the characteristics inherent to pediatric patients, who regardless of the severity and complexity of the disease for which they are hospitalized, still depend on adults to perform daily living activities and also require continuous supervision to ensure their safety[17].

The Delphi technique was chosen to evaluate the care categories because of its flexibility, which permits performing as many stages as necessary until the expected level of agreement is reached. The advantage of this technique is in reaching a significant number of respondents from different professional practices, such as direct care, management, teaching and research, even if these are located in distant places, in order to make the assessment as broad as possible[13-14].

However, the incorporation of changes suggested from a distance is not an easy task, which can generate the need to return the model several times to the judges until a high level of agreement is achieved. Hence, when a low level of agreement and clarity was achieved for the care categories after the first phase of the Delphi technique, we verified that, given the importance of the subject, not being able to personally meet the judges would impede the achievement of a consensus and conceptualizing the categories of pediatric care.

Having the opportunity to meet the two judges personally was a favorable factor. The direct debate among people with different backgrounds and professional experiences enabled the development of a proposal that was well accepted by the judges who evaluated the categories from a distance. Given this experience, we suggest teamwork as a methodological strategy to design the model to be analyzed, before applying the Delphi technique.

The validity of the conceptualizations was ensured after two meetings were held between the researcher and each judge, so that after the reformulation, an excellent level of agreement was obtained from the panel regarding the new conceptualizations (between 85% and 100%).

The design of the five categories of care in pediatrics enables the performance of new studies to estimate the time spent by the nursing team meeting the needs of pediatric patients, supporting the decision-making process concerning an appropriate apportioning of personnel both in quantitative and qualitative terms.

CONCLUSION

This study enabled a proposal to characterize pediatric patients in a relatively easy way and therefore has the potential to be used to ground the division of personnel in pediatric nursing. Five categories of care actions in pediatrics were conceptualized and validated: *Minimum Care, Intermediate Care, High Dependence Care, Semi-intensive Care* and *Intensive Care.*

We stress that the content validation process through the Delphi technique and also the meetings held with the judges involved in teaching, research, direct care and management of pediatric units, with different competencies to evaluate patient classifications in pediatrics, supported essential changes in the definition of the proposed care categories, considering the care delivery and administrative contexts of the pediatric hospitalization units.

The classification of patients in care categories supports the assignment of nursing personnel in the pediatric nursing field; however, identifying the average hours spent providing nursing care in each category of care actions in pediatrics is needed.

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