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# Qualitative validation of a scale for nursing workloads in hospitalization units

Validação qualitativa de uma escala para medir a carga de trabalho de enfermagem em unidades de internação

Validación cualitativa de una escala para medir la carga de trabajo de enfermería en unidades de internación

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## Abstract

**Objective:** To design and validate a scale to measure nursing workloads in Adult Hospitalization Units based on Nursing Interventions (NIC).

**Methods:** Analytical, descriptive, observational, prospective study, using mainly qualitative research methodology, by means of focus groups, committee of experts and individual interviews, to validate a Workload Measurement Scale in Adult Hospitalization Units, from the selected interventions (NIC) on a basis of the inherent characteristics of such units. A random selection was used to determine the participants (nurses and experts) and it is representative of the hospitalization units under study. It was carried out from October 2018 to April 2019.

**Results:** Not only the focus groups but also the individual interviews and the committee of experts conducted agree on the importance of obtaining an instrument to measure workloads validated by the professionals themselves and representative of their work, with standardized language and adapted to actual healthcare. The quantitative analysis conducted by the committee of experts shows a highest relevance (91,67%) in the items: "Prevention" and "Health education", as well as consistency with the construct and appropriate wording in 99% of the items selected. Evaluators maintained the action on all items with a 75% to 100% acceptance rate.

**Conclusion:** The qualitative study carried out provides the necessary data for the design and validation of a scale to measure nursing workloads, identified from the nursing interventions (NIC), as indicators of human resources management.

## Resumo

**Objetivo:** Projetar e validar uma escala para medir a carga de trabalho de enfermagem em Unidades de Internação de Adultos com base na Classificação de Intervenções de Enfermagem (NIC).

**Métodos:** Estudo analítico, descritivo, observacional, prospectivo, utilizando principalmente metodologia de pesquisa qualitativa, por meio de grupos focais, comitê de especialistas e entrevistas individuais, para validar uma Escala de Medição da Carga de Trabalho em Unidades de Internação de Adultos, a partir das intervenções selecionadas (NIC), com base nas características inerentes a tais unidades. Foi utilizada seleção aleatória para determinar os participantes (enfermeiros e especialistas) e é representativa das unidades de hospitalização em estudo. O estudo foi realizado de outubro de 2018 a abril de 2019.

**Resultados:** Não apenas os grupos focais, mas também as entrevistas individuais e o comitê de especialistas demonstraram concordância sobre a importância de se obter um instrumento para medir a carga de trabalho validado pelos próprios profissionais e representativo de seu trabalho, com linguagem padronizada e adaptada

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à saúde real. A análise quantitativa conduzida pelo comitê de especialistas mostra uma maior relevância (91,67%) nos itens: “Prevenção” e “Educação para a saúde”, bem como a consistência com a construto e a redação apropriada em 99% dos itens selecionados. Os avaliadores mantiveram a ação em todos os itens com uma taxa de aceitação de 75% a 100%.

**Conclusão:** O estudo qualitativo realizado fornece os dados necessários para a concepção e validação de uma escala para medir as cargas de trabalho de enfermagem, identificadas a partir das intervenções de enfermagem (NIC), como indicadores da gestão de recursos humanos.

## Resumen

**Objetivo:** Proyectar y validar una escala para medir la carga de trabajo de enfermería en unidades de internación de adultos con base en la Clasificación de Intervenciones de Enfermería (NIC).

**Métodos:** Estudio analítico, descriptivo, observacional, prospectivo, que utilizó principalmente metodología de investigación cualitativa, por medio de grupos focales, comité de especialistas y entrevistas individuales, para validar una Escala de Medición de Carga de Trabajo en Unidades de Internación de Adultos, a partir de las intervenciones seleccionadas (NIC), con base en las características inherentes a tales unidades. Se utilizó selección aleatoria para definir los participantes (enfermeros y especialistas), que es representativa de las unidades de hospitalización en estudio. El estudio fue realizado de octubre de 2018 a abril de 2019.

**Resultados:** No solo los grupos focales, como también las entrevistas individuales y el comité de especialistas demostraron concordancia sobre la importancia de obtener un instrumento para medir la carga de trabajo, validado por los propios profesionales y representativo de su trabajo, con un lenguaje estandarizado y adaptado a la salud real. El análisis cuantitativo conducido por el comité de especialistas muestra una mayor relevancia (91,67 %) en los ítems: “Prevención” y “Educação para la salud”, así como una consistencia respecto a la elaboración y redacción apropiada en el 99 % de los ítems seleccionados. Los evaluadores mantuvieron la acción en todos los ítems con un índice de aceptación de 75 % a 100 %.

**Conclusión:** El estudio cualitativo realizado proporciona los datos necesarios para la elaboración y validación de una escala para medir la carga de trabajo en enfermería, identificada a partir de las intervenciones de enfermería (NIC), como indicadores de la gestión de recursos humanos.

## Introduction

Human resources in nursing must be managed according to a needs plan, in the aim of planning taking into account the existing economic and material resources, and always bearing in mind healthcare criteria that will be essential to determine it, as can be seen currently in the situation of pandemic by COVID-19 that we live.<sup>(1)</sup>

The analysis of these criteria and their interpretation cause the variations that we can see in our health map when relating the different needs of human resources, what Domínguez Alcón said in 1984 about management, strategies and provision of health care professionals is still very relevant today.<sup>(2)</sup>

Determining the appropriate number of nursing staff according to the patients needs, and the consequent workloads these needs generate, is essential to provide quality care, patient safety and a balance in the economic cost-benefit management in any health system.<sup>(3)</sup>

In Spain, NEMS and NAS scales are the most commonly used instruments to measure workloads, in Intensive Care and Critical Care Resuscitation Units, and the Nursing Interventions are not properly included in these scales. This would allow an adequate assessment

of workloads and time invested in such interventions, which would make easier to determine the need for human resources.<sup>(4,5)</sup>

In reference to the adequate use of these nursing resources, we deal with two fundamental aspects, the qualification of the professional practioners and their correct quantification.<sup>(5)</sup> “Qualification”, referring to the professional competencies that allow, the application of health care based on a methodology and taxonomies with their own knowledge framework, and “Quantification”, with respect to the permanent discussion on the demand for professionals and cost containment policies, it results that the formulas used are based more on quantitative than qualitative factors.<sup>(6,7)</sup>

Instruments are therefore required to measure and quantify workloads and adapted to the real needs and demands of patient care and in turn, expressed in a standardized terminology similar to the one provided by nursing interventions, so that the language used would be internationally recognized and commonly applied by all healthcare professionals.<sup>(8,9)</sup>

The measurement of workloads is a useful tool to know the tasks of “caring”, and the time required for each one. Studies carried out on this subject state that workloads include the identification, list of activities and measurement of time

spent<sup>(9)</sup> highlighting the numerous negative consequences when there is an imbalance between workload and the amount of human resources to assume it (health care errors, psychosomatic disorders and low quality of life of the professional nurse, increased morbidity and mortality in the client-patient...)<sup>(4,7-14)</sup>

In Nursing, patient safety is associated with the incorporation of individualized care plans for each patient, according to the NANDA (North American Nursing Diagnosis Association) nursing nomenclature and taxonomy,<sup>(15)</sup> which is internationally accepted. Therefore, it is becoming indispensable for nursing work to be defined by means of NIC (Nursing Interventions Classification),<sup>(16)</sup> as recommended in our country by the Ministry of Health.<sup>(17)</sup>

The nursing workload assessment scales provide the patient classification according to their care needs, fostering quality control and comparison between units with similar characteristics, as well as objectifying the workload and the specific staffing needs required by the unit or service. This optimizes nursing human resources and the management of health expenditure, as numerous studies show, mostly focused on special units in the hospital environment.<sup>(18-20)</sup>

Our research is focused on the need for a tool that measures workloads according to the interventions carried out by nurses in hospitalisation units, with a standardised language adapted to actual health care. The aim of this research is to design and validate a scale to measure nursing workloads in Adult Hospitalisation Units, based on NIC interventions.

This study corresponds to the first phase of a research project financially supported by The Institute of Health Carlos III, in relation to the Spanish National Plan for Scientific and Technical Research and Innovation 2017/2020, aimed at projects and initiatives in health services research, as a research priority in the challenge “Health, demographic change and well-being”, and within the “Spanish Multiregional ERDF Operational Programme (POPE) 2014-2020” (PI18/00950).

## Methods

The aforementioned project is designed to guarantee the transfer of concepts between the different professional functions of nurses, such as management, teaching, research and patient care, in which we can include the NIC interventions. These reflect the nursing workload carried out in hospitalisation units according to patients’ demands in real situations.

This first phase of the research, with the design and validation of a scale to measure nursing workloads for adult hospitalisation units. The items are defined using nursing terminology by means of NIC interventions,<sup>(13)</sup> and a first validation was carried out by means of qualitative methodology which consists of: focus groups, individual interviews and a committee of experts, until obtaining the scale that would go on to the next phase of quantitative pilot validation and multi-centre study, to be carried out subsequently.

Study design: Analytical-descriptive, observational and prospective study, using qualitative and quantitative descriptive research methodology.

A descriptive documentary review was conducted, it consisted of a literature search on the main instruments to measure nursing workloads, based on nursing interventions in the hospital field, as an indicator of human resource needs, published in Spanish and English in the last 10 years.

The search was performed on scientific databases and digital repositories and accredited websites using boolean operators and using keywords from health sciences descriptors, to create search strings.

After a literature review, an analysis of such literature is performed. On this basis, a draft scale to measure nursing workloads is elaborated by the research team, with the collaboration of a psychometrician, a measurement scales expert. This scale includes the four functions of the nursing profession: patient care, teaching, management and research, and whose items are based on a selection of the most appropriate NICs for each nursing function according to the activities and tasks to be performed in the different Hospitalization Units.

This scale was subjected to a qualitative validation, which consists of focus groups, individual interviews, and a committee of nationally and internationally recognized experts in this field. A quantitative descriptive analysis was also carried out to complement the qualitative one. The psychometric analysis focused on guaranteeing the reproducibility and validity of the Scale, describing the test-retest and inter-observer reliability, the internal consistency and discriminate power, with respect to reproducibility, as well as the validity of criteria, appearance and content.

### Detailed description of the following stages and the methodological procedures and analyses carried out, sample and scope of study:

- Focus Group: Qualitative technique, aimed at collecting the opinions, contributions and proposals of the professionals about the scale to be validated. Two focal groups were constituted. A first group with 8 professional nurses from hospitalization units, and a second focus group with 8 professional nurses who not only carry their health care duties in these units in a tertiary level hospital, but are also references of quality.

A structured and open group interview to the two representative groups of the professional nurses was conducted, providing their professional and personal experiences and knowledge on the research topic to improve the initial design of the scale created by the research team. Each interview lasted approximately 2 hours and was audio and video recorded. The data were analysed using a specific software for qualitative methodology, Atlas.ti8.

- Individual interviews: 10 semi-structured individual interviews to nursing care professionals and supervisors in hospitalization units. These were audio recorded for further analysis using the program Atlas.ti8.

The participants in each part of this validation went through a random selection. The principle of saturation was applied, when determining the number of interviews and number of focus groups needed in such a way that the sample

was representative of most types of hospitalization units (in terms of patients and medical specialty).

- Committee of Experts. A double analysis of the contributions from nationally and internationally recognised experts on each item of the scale was carried out:

- The quantitative analysis focused on assessing the content validity of each item, and the whole scale through these 12 experts' advices. Each expert evaluated individually each item of the scale, applying several types of evaluation. The first two are related to the construct, one corresponds to the relevance they give to the item to explore it, using a Likert scale that goes from 1 to 4 being: 1=not relevant, 2=slightly relevant; 3=very relevant and 4=high relevance, and the other its consistency, valuing it as "consistent" or "not consistent".

Also, they expressed their view on the wording and understanding of the item, evaluating it as: "poor," "acceptable" or "good", and what would be their action to follow with each one according to the previous evaluations: "maintain", "change", or "remove". This analysis was carried out using the SPSS program.

- For the qualitative analysis, a section was included at the end of each block. This is a space, to be individually completed, for "comments" on the scale in general and on each item, and they are also requested to clarify their decision in case of a negative evaluation in any of the aspects under evaluation. There was also a section for "suggestions", in which they could expose their proposals in terms of overall assessment of the scale and individual assessment of each item, expressing whether they thought it was appropriate to incorporate new items, or nursing functions that were yet to be explored or incomplete.

For the committee of experts, a template of the initial scale was elaborated, incorporating the modifications proposed by the

focal groups and individual interviews and including Liker scales with codified scoring explained above. These were sent by e-mail, along with a letter of invitation thanking their participation in the committee. They were registered at the Intellectual Property Office.

- **Timeline:** This phase of the project was carried out the last 3 months of 2018, for the initial design and focus groups, and during the first 4 months of 2019 for the individual interviews and the committee of experts.
- **Ethical aspects:** The corresponding permissions were requested from the Ethics Committee, maintaining confidentiality, as established in Law 15/1999, of 13 December, on the Protection of Personal Data (PDGP, Spanish acronyms), and the General Data Protection Regulation (GDPR), 2016/679, of 27 April.

## Results

After conducting the focus groups and individual interviews, we were able to see that participants' statements, opinions and suggestions coincided. After being analysed with the Atlas.ti8, these were schematised by means of a network of codes assigned to each common topic discussed in the different methodologies, and to which we associated a textual quotation proposed by the participants, representative of that code, and which identifies the common opinion, after observing saturation in the results.

Their interrelationship can be observed, what can show how the participants have valued the scale, its items, the professional functions involved, their vision of the profession, human resource management and the importance of measuring workloads to improve the quality of care provided by nurses to their patients (Figure 1).

On the basis of the scale to measure workloads, some important issues for nursing such as management are related, highlighting the importance to be a nursing competence, where the measurement of workloads plays an crucial role,

as well as its relationship with the possible repercussions it could have in patients and professionals (Figure 1).

Also, the relationship of the scale under study with the importance of the participation of healthcare professionals both in its design and in its validation, in order to facilitate and improve its future applicability and so that it may be globally representative of all the work carried out by nurses in adult hospitalization units, considering the aspects of the design of the scale such as the choice of the most appropriate items on a basis of NIC interventions, and the time assigned to carry them out, as well as the different nursing functions it includes (Figure 1).

These assessments are all related to how important this study is for healthcare professionals to be innovative and for the scale proposed by the research group, since no studies or research have been found that show scales to measure workloads, associated with NIC interventions, for hospitalization units, as it was explained in the introduction.

With regard to the results to the committee of experts, in the quantitative-descriptive analysis, we can see that the best-valued items in terms of relevance, referred as "high relevance" (91.67%) were: Prevention and Health Education and Specimen Collection and Handling with a lower relevance (Figure 2).

The items obtained a 100% consistency rate with the construct: Help for self-care, Prevention, Medication, Health education, Nutrition management, Care of devices, Change of position, Environmental management: comfort, Emotional support and active listening, Encouraging family involvement, End of life care, and Teaching during work shift, all items were assessed at least with a 83.33% consistency rate (Figure 3).

With regard to wording, the most valued items were: Health education with a 83.33% assessment rate as acceptable, followed by Change of position with 75%.

The evaluator decided to maintain the item proposed at a 100% rate was: Support for self-care, Prevention, Monitoring, Change of position, and End-of-life care.

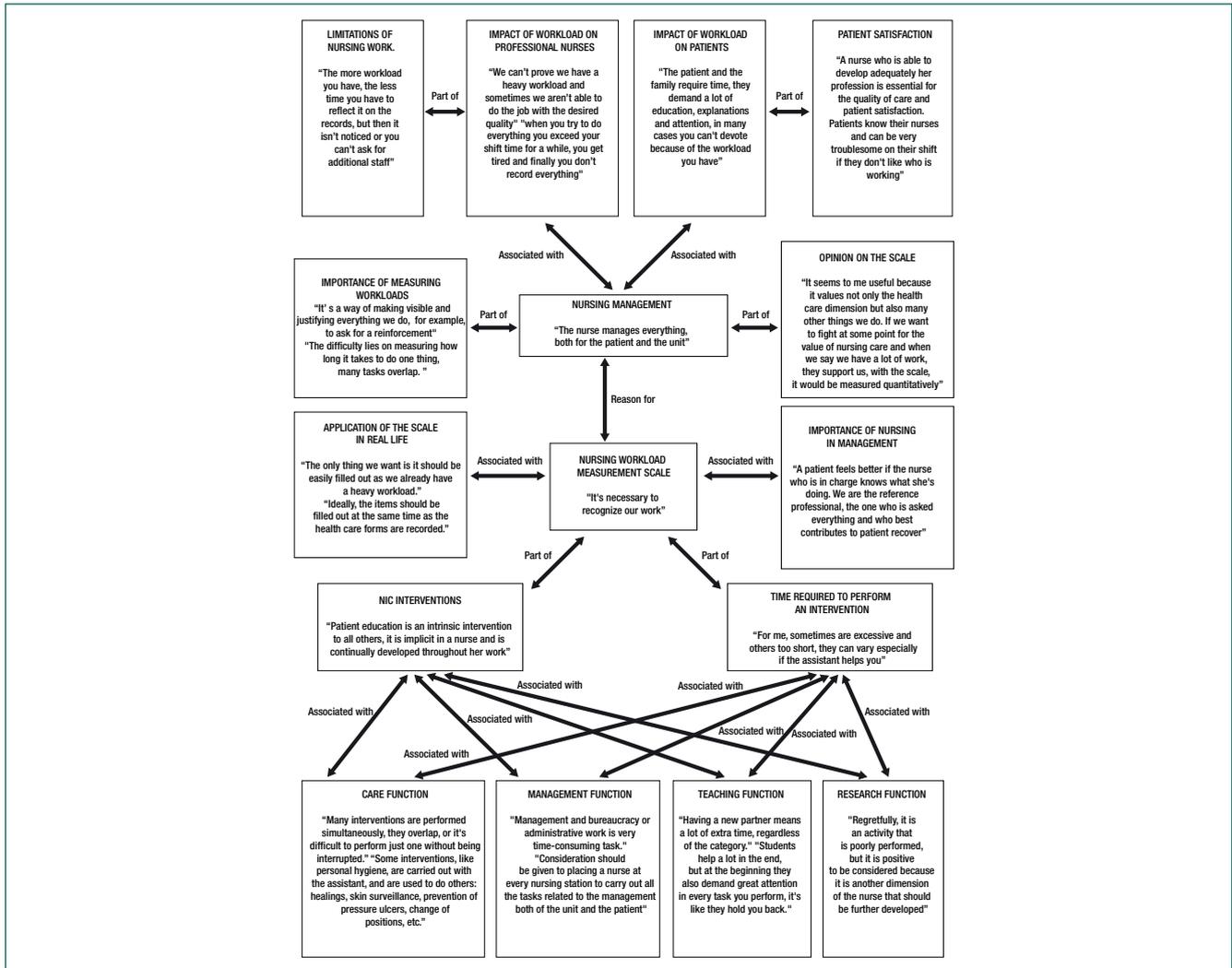


Figure 1. Analysis of focus groups and individual interviews with nurses

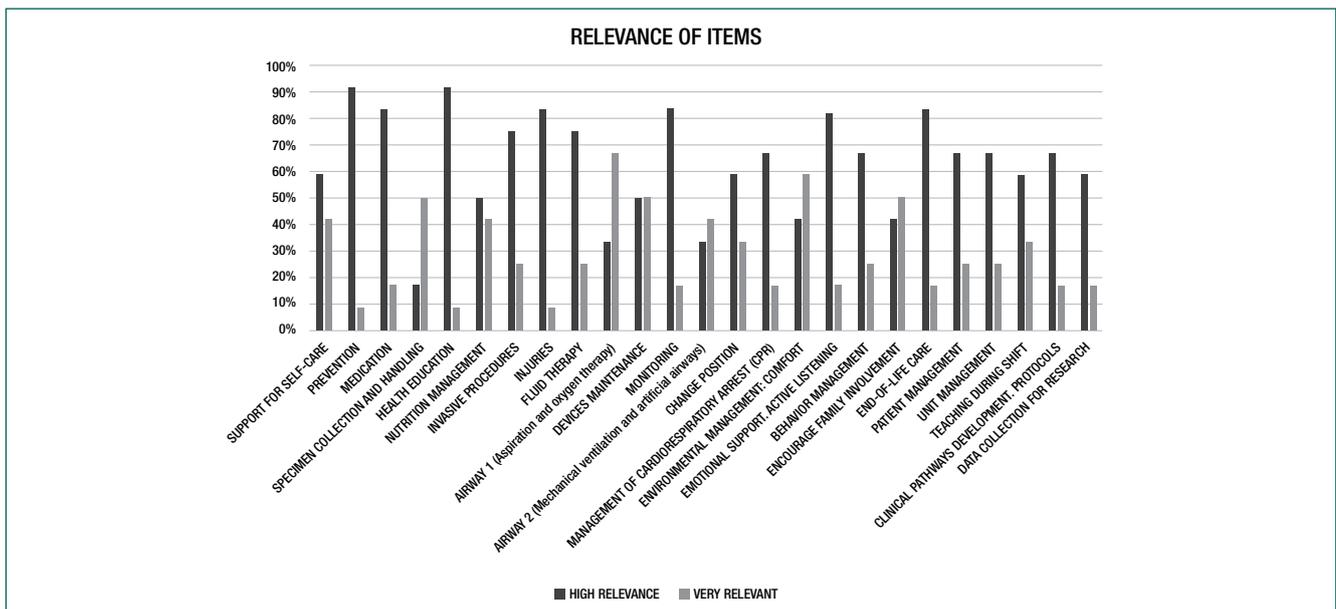
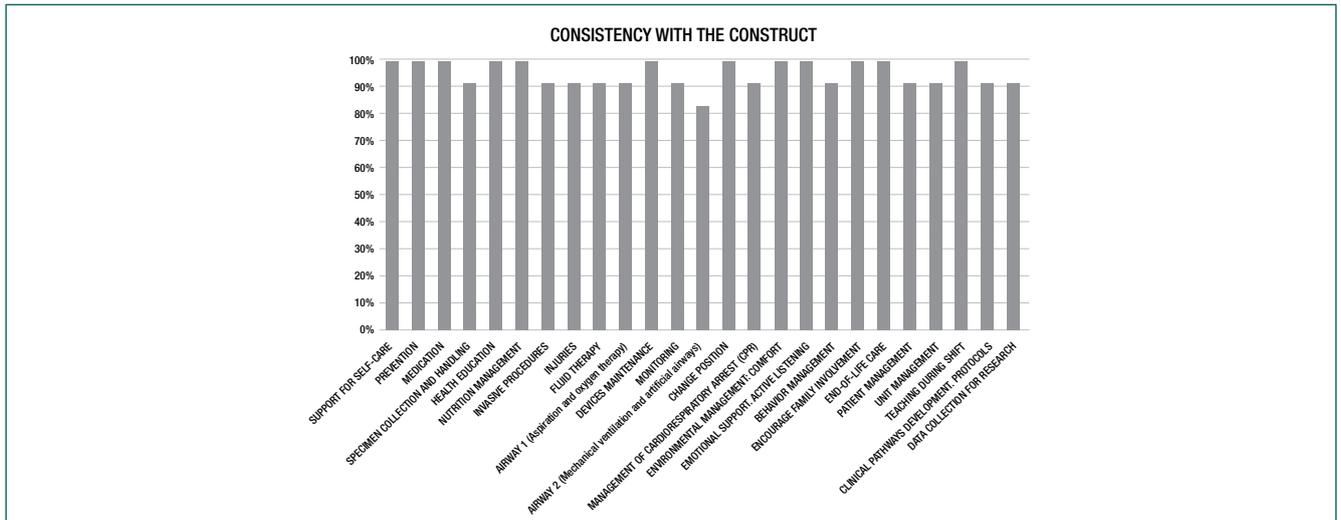


Figure 2. Relevance of items referred by experts as “high relevance” and “very relevant”



**Figure 3.** Consistency of items according to the committee of experts

Regarding the qualitative analysis obtained from the contributions and comments from the experts consulted, these coincide with the statements issued both in the focus groups and in the in-depth interviews, highlighting the coincidences in the following topics:

- The difficulty in understanding some items due to the lack of familiarity with NIC terminology.
- The controversy about times assigned to each of the items to be performed, (times standardized by NANDA), which are mostly not in line with actual patient care, either in excess or by default
- The importance of obtaining a workload measurement tool for hospitalisation units that eases to manage nursing human resources according to the real demands of patient care.
- The success of having a measurement tool that includes all the interventions carried out by nurses from the health care to the management function, including teaching that is carried out continuously with patients and colleagues, as well as research.

## Discussion

The measurement of nursing workloads requires tools adapted to the characteristics of the units to be measured. For this reason, if we have to measure the nursing workload in hospitalization units,

we cannot use other existing tools created for other types of units, such as those used for Intensive Care,<sup>(4,10,18)</sup> but rather they must be instruments adapted to the own nursing activity carried out in hospitalization, including all the functions of the nursing profession.

This reflection also appears in other studies,<sup>(21)</sup> in which the potential of workload measurement tools to help decisions making related to nursing staff is highlighted, but a more holistic approach is required to consider additional factors to ensure that solid planning models are developed.

In this process of adaptation, it is essential to use the standardised nursing language proposed by NANDA,<sup>(15)</sup> and within this system, its NIC interventions,<sup>(16)</sup> as a model for the development of measures for nursing workloads.<sup>(22)</sup>

As it appears in other publications consulted,<sup>(9)</sup> use of NIC interventions<sup>(16)</sup> have also been adopted as a reference to measure workloads in nursing teams,<sup>(9,13,22-24)</sup> but they have not been developed in a global way that is valid for any adult hospitalization unit, but rather they focus on specific units classified by medical specialties.<sup>(21,23,24)</sup>

We have also found recent studies that used qualitative methodologies to validate tools in a similar way to the study we present, pointing out that they provide a critical analysis to improve the tool initially proposed.<sup>(9,23)</sup> However, they focus on some specific medical specialties that

define a type of patient with a particular profile who requires very specific care, such as oncology units<sup>(9,23)</sup> or mental health units<sup>(21)</sup> instead of creating an instrument that can be used in any adult hospitalization unit. An instrument that takes into account all the nursing functions, not only the patient care, even though this one is the most commonly associated with the nursing profession, but also the management function, such as teaching and research, more and more present in the profession.

In our study, as well as in others consulted<sup>(9,22,23,25)</sup> the importance of balancing knowledge of NIC interventions<sup>(16)</sup> and the practical care experience of the units we wish to assess is clear. That is why in our study we decided to give voice to the professionals, using different methodologies, to see their agreement in a qualitative way, to enrich the instrument that results from this validation, to reflect the actual health care of this type of unit, and consequently facilitating its applicability and assimilation by professionals who highly demand it, according to their own opinions found in other publications,<sup>(20)</sup> to improve human resource management and to improve the quality of care they provide to their patients.

## Conclusion

Conducting this study, as the first phase of a project, including qualitative methodology, constitutes the essential beginning to be able to design and validate a scale to measure workloads for nurses who work in hospitalization units. The use of a validated scale (global objective of the project) to measure workloads in hospitalization units, associated with NIC Interventions, a scale designed and validated from the opinions, experiences and contributions of the professionals, by means of the instruments of qualitative methodology used, objective of this study, makes evident an adaptation to the real situation in which it will be used, since the professionals themselves redesign and validate the scale that they could use. This study confirms the existing need among healthcare professionals

to measure and quantify the workload they support associated with the actual nursing interventions carried out in all hospitalization units. These interventions are always the most reliable indicator to determine the amount of necessary nursing personnel and considering the proposed scale as a relevant management tool when associating the nursing human resources with the demands and real needs of patients care, to improve the quality of care, the safety of the patient while it improves the professional nurse activity. Let us not forget that the novelty and importance of this research lies in the fact that it is carried out in hospitalisation units, services that, despite using nursing terminology, do not apply workload measurement tools associated with the actual nursing interventions that occur in those services, since they have traditionally been more developed in intensive care units.

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## Collaborations

Hellín Gil MF, Seva Llor AM, Roldán Valcárcel MD, Maciá Soler ML, Mikla M and López Montesinos MJ contributed to the project design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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