Towards a Uniform Nursing Minimum Data Set in Portugal

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Citation:

Introduction

In the nineties, a pioneer research project in the area of Nursing Information Systems (NIS) was carried out in Portugal by Silva¹. Based on the results of that project, a nursing data model was experimentally integrated into the health information systems of three Portuguese hospitals². After, Sousa et al.³ replicated the project in three health centers in northern Portugal. As a result of these projects and the availability of nursing data stored electronically in information systems in the hospitals, and in the health centers located in Matosinhos’s local health unit, a software module was built to allow for real-time data exchange between the hospital and health centers⁴.

Thus, nurses are using computers with the appropriate software to record nursing data in many Portuguese hospitals and health centers. This software is broadly available throughout the country, because it was developed in partnership with the Ministry of Health and also, because the Portuguese Health System is almost entirely public
and free. The software incorporates the International Classification of Nursing Practice (ICNP©)\(^5\), according to the Health Ministry and to the Portuguese Nurses Association (Ordem dos Enfermeiros) recommendations. In NIS, ICNP© is used as a standardized terminology for composing nursing diagnoses, interventions and outcomes, which are systematically used by nurses to document their practice. This allows us to compare nursing data in different settings, throughout the country.

The software is based on a nursing data model that has some important characteristics: a) it uses the International Classification of Nursing Practice (ICNP©) as a controlled vocabulary for state nursing diagnoses, interventions, and outcomes; b) it promotes the linkage (“data referential integrity”) between nursing diagnoses, interventions, and outcomes; c) it emphasizes the autonomous dimension of nursing care (i.e.: the NIS structure makes it clear that nursing care is a result of nurses own clinical decision rather than those interventions that result from physician prescription). In summary, in the past few years, several hospitals and health centers have collected a large amount of information about nursing care using the same data model. This information represents the nursing care carried out by the Health Centers, guided to the promotion and surveillance of individuals' health and families, and those that take place during the hospital admission episodes.

It is important to formalize knowledge by processes of concept clarification and by empirical approaches that contribute to identifying the relationships between nursing concepts. Thus, nursing classifications are an important contribution to the progress of the nursing profession. Many authors have stated that concepts must be shared in order to evolve from nursing data to nursing information and nursing knowledge\(^6\text{--}\text{9}\). Delaney et al.\(^9\) said that “discipline-specific and interdisciplinary knowledge building and evidence-based best practices depend on data acquisition, storage, retrieval and analysis-extraction tools…” (p. 1537).

**Background**

Argyris & Shön\(^10\) theorized about the change process and particularly about strategies to put theory into practice by increasing professional effectiveness. They assumed that change strategies are better accepted by people when they are: a) based on valid information; b) chosen based on free and informed decisions; and c) based on internal bonding about the decisions taken. In our case, we need valid information about nursing care to: promote reflective practitioners\(^11\); make free and informed decisions about nursing care; and assume ownership for the decisions made by the group about care processes. This is particularly important when we want to discuss how to optimize the information we have in order to produce nursing care of the highest quality possible\(^12\).
Since 2001, the Portuguese Nurses Association assumed the NMDS definition as an essential resource for Nursing Care Quality Improvement Programs in Portugal.

Already in the 1960s, Donabedian\textsuperscript{13} established three types of quality indicators: structure, process, and outcome. Since then, many healthcare quality management systems have been developed; however, the majority of these systems are focused on quality indicators of the structure or on the process. Thus, it is important to define health indicators that have the potential to represent the unique contribution that these three indicators make to people’s health.

Several authors\textsuperscript{6, 14-18} have stated that it is important to define a Nursing Minimum Data Set (NMDS) so as to add nursing data into health databases. The concept of Minimum Data Set crosses the entire health domain\textsuperscript{19}. In 1991, Werley et al.\textsuperscript{6} defined NMDS as “… a minimum set of items of information with uniform definitions and categories concerning the specific dimension of nursing which meets the information needs of multiple data users in the healthcare system” (p.422). As the authors stated in the same paper, in 1983 the Health Information Policy Council (USA) proposed the concept of Uniform Minimum Data Set in order to facilitate the evolution from health data to health information.

In this study, nursing data has the potential to produce valid information to be used by nurses in order to improve nursing care quality in the following manner: a) information about nursing care that is structured by the same data model; b) software that is used incorporates ICNP© as a controlled vocabulary with uniform definitions and categories concerning the specific dimension of nursing; and c) data in electronic format from hospitals and health centers. However, since the initial project in 1995, software companies have developed different solutions that they have been implemented in some hospitals and health centers. Thus, the question arises: which health indicators need to be produced, on a regular basis, in order to have useful information for the different partners in the health domain? In the particular case of nursing, the question is: which nursing indicators do we want to produce on a regular basis in order to have useful information about nursing care that would be useful at the different decision-making levels?

Therefore, it was decided to first identify the nursing indicators that we want to produce on a regular basis to define the minimum set of items of information with uniform definitions and categories that would allow these indicators to be produced.

This study was supported by a Northern Portuguese Department of the Ministry of Health project, which intends to normalize and to control a data set for health indicators production, independently of the solutions that software companies can develop for different health services. The results of this study may contribute to the definition of that data set, which the Ministry of Health and the Portuguese Nurses
Association recognize as essential in all Nursing Information Systems in Portugal.

**Purpose**

The study reported here represents the first of two phase’s strategy to develop a NMDS in Portugal, using an exploratory, descriptive design incorporating a Focus group approach and the Delphi survey technique.

In this phase, the initial research question was: which nursing indicators, in the nurses' opinion, must be produced on a regular basis in order to have useful information about nursing care at the different decision-making levels? It was assumed that there is a difference in the information that nurses need at different decision-making levels, but that, despite these differences, the definition of the indicators must be made in a bottom-up manner. This means that the information required by those at higher decision-making levels is an aggregation of the data that is required at lower levels\(^{16}\). It was thus assumed that by defining the nursing indicators needed at the point-of-care (to be used mainly in quality improvement), the data required to generate the indicators required for higher level decision-makers would be produced through the use of different data aggregation strategies, for instance: considering the total number of Pressure Ulcers prevented in a hospital or in a group of hospitals; or the frequency of Dependency in Self Care in a district. Thus, the research question was: which nursing indicators are perceived by point-of-care nurses as useful cornerstones of quality management? In fact, this work deals with nursing care quality, only in nurses’ point of view.

In synthesis, the aims of the study were: 1 –; To identify which nursing indicators are perceived by point-of-care nurses as useful cornerstones of quality management; 2 - To identify the minimum set of information items with uniform definitions and categories that would allow the production of the previously defined indicators.

**Methods**

An exploratory, descriptive design incorporating the Focus group approach and the Delphi technique was used. From January 2003 to October 2004, the Focus group held a session each month. As a complement to the Focus group, two rounds of questionnaires were used in the Delphi survey. The questionnaires was constructed by the principal research, based in aspects emerged in Focus group. These questionnaires were administered by the research team. The first round took place in July 2003 and the second round occurred in March 2004. The results of the two questionnaires were integrated in the Focus group work; in order to expand the reach and the quality of its discussions.
Setting

Seven public hospitals and ten public health centers located in different districts of northern Portugal expressed their interest to participate in the project. The study was limited to this context, since its main supporter was the Northern Department of the Ministry of Health.

Samples

The Focus group consisted of 24 experienced nurses, working in the mentioned settings. Participants were intentionally selected according to their involvement in previous programs related to nursing information systems or continuous quality improvement projects. The same participants were used for all 22 sessions. Participants represented the hospitals and health centers involved in this phase of the study. Eleven participants came from health centers and thirteen from hospitals. This group included general, specialist and head nurses, representing the main nursing specialties recognized by the Portuguese Nurses Association. Nearly all participants were femals, with a mean age of 38 years and with a mean of 14 years of professional experience.

For the Delphi survey, all nurses who work in the hospital wards and health centers involved in this stage received the first round questionnaire (approximately 1000 nurses); 531 valid questionnaires were returned in the first round and 301 in the second, yielding a convenience sample. Participants had a mean age of 34 years (range of 21-65 years) and a mean of 11 years of nursing experience (range of 1-41 years); 83% were general nurses, 13% were specialist nurses, and 4% head nurses. Participants who worked in hospitals came from medical wards (34%), pediatric wards (20%), emergency-rooms (13%), surgical wards (9%), obstetrics (9%), operating-theaters (7%), intensive care units (5%), and others (3%).

Data collection

Focus Group represents the main methodological resource of this study phase. The average duration of Focus group sessions was three hours. The sessions were recorded on audiotape and then transcribed for content analysis. All sessions occurred in a room located at the North Department of the Ministry of Health, with excellent environment conditions. The participants’ attendance to each one of the Focus group sessions range from 70 – 90 %.

The Delphi survey constituted a methodological complement; allowing the knowledge of the opinion from a large sample of nurses, regarding some specific aspects that emerged from Focus group work. The purpose of the first questionnaire was to obtain nurses’ opinions about the focus of attention that would be more sensitive to nursing care in each setting.
We used 128 ICNP© Focus (selected by the nurses focus group, according to its frequency in nursing documentation) and a 7-point Likert scale (range: “very sensitive to nursing care” to “not sensitive to nursing care”) to develop this first instrument (figure 1).

Figure 1 – Examples of items in ICNP© Focus sensitivity to nursing care questionnaire

<table>
<thead>
<tr>
<th>Convulsion</th>
<th>Very sensitive</th>
<th>Not sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Applicable: ___</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self Care: Transferring</th>
<th>Very sensitive</th>
<th>Not sensitive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Applicable: ___</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The second questionnaire gathered the nurses’ opinions about the utility (range: “very useful” to “useless”) of each one of nursing indicators drafted, in the meantime, in focus group (Figure 2 on next page).

Data analysis

The material which emerged from Focus group sessions, through an inductive process of content analysis based in constant comparison and establishment of relationships, according to Strauss & Corbin recommendations, was organized in themes, categories and subcategories. A three member panel of researchers familiar with inductive analysis reviewed the data and findings emerged from Focus group work to evaluate its credibility and integrity.
The material that resulted from questionnaires was submitted to descriptive statistical analysis procedures and then, to determine the agreement in the answers, the following criteria were used:

a) 75% of the answers had a score of 6 or 7;

b) Median score > 5;

c) Mode score > 5.

**Ethical considerations**

The study was approved by the Northern Department of the Ministry of Health and by the hospitals and health centers involved. Anonymity was guaranteed to the participants in the focus group and in the Delphi survey. Codification was used for identificational purposes during the content analysis process.
Findings

To organize the findings, data was grouped into three different areas according to the major themes and categories that emerged from content analysis of the focus group material. First, based on the concept of sensitivity to nursing care the ICNP© Focus for the domains of practice that emerged from the first questionnaire will be discussed. After this, the different types of nursing indicators that the focus group decided to produce will be presented. Finally, the set of information items for the NMDS will be presented for each group of elements.

The sensitivity to nursing care

During the first stage, the focus group work was concerned with the questions about the sensitivity to nursing care. Questions about this theme led to discussions about the health domains highly dependent on nursing care and the contribution of nursing interventions to the outcomes.

“*We (nurses) must be centered in aspects that depend of our singular and particular work.*

*There are health domains that depend of our interventions to achieve success. We need data about that... to quality improvement in our wards. I’m not only talking about, pressure ulcers, but also about, for instance, preparing a family caregiver to take care of someone dependent, at home. This is a very important area; we do so much for these cases. The quality of nursing care plays a relevant role here*” (Focus group session)

The focus group decided to include nursing interventions, only resulting from nurses’ clinical decision, within the model that sustains the idea of outcomes sensitive to nursing care. In this group, interventions resulting from physician prescription were omitted (i.e. medication or other medical orders).

A set of nursing interventions was selected and linked to a specific nursing diagnosis. For instance, the nursing intervention *Instructing family caregiver to feed the patient using a gastrointestinal tube* was linked to the nursing diagnosis *Family Caregiver's skill learning to feed the patient*; or *Teach the patient about self-care: transferring strategies* was associated to the nursing diagnosis *Dependency in Self Transferring.* This
work, done by the focus group, was based on analyses of the NIS in use in each setting where linkages between nursing diagnoses and interventions are defined. At the end of this stage, we determined that 67% of all nursing interventions defined belonged to Informing – (Telling somebody about something) ICNP© type of action; 19% to Attending – (Being concerned about, waiting on, or looking after somebody or something); 7% to Performing – (Doing a technical task); and 7% to Managing (Being in charge of and bringing order to somebody or something). This data shows the key contribution that the interaction (nurse / client) has in nursing sensitive outcomes production.

According to “The Nursing Role Effectiveness Model”²¹, the idea of “sensitivity to nursing care”, emerged in focus group, is based in nursing independent role that concerns functions and activities initiated by nurses in response to the clients problems.

ICNP© Focus by practice domains

In the discussions concerning the concept of sensitivity to nursing care, the focus group included the first questionnaire results. Here, we only present the similarities and the differences between the Health Center and the Hospital. Table 1 lists the ICNP© Focus for which consensus was achieved by the health center nurses.

<table>
<thead>
<tr>
<th>ICNP© Focus</th>
<th>Concordance (%)</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
<td>80.10</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Caregiver Role</td>
<td>80.00</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Management of Therapeutic Regime</td>
<td>79.80</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pressure Ulcer</td>
<td>78.40</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Standing</td>
<td>78.10</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pregnancy adaptation</td>
<td>77.30</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Self Care: Hygiene</td>
<td>75.50</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Turning of own body</td>
<td>75.50</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pregnancy Prevention</td>
<td>75.50</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>
Health center nurses were particularly concerned about aspects that are associated with the maternal / infant-child domain, particularly Parental Role, Maternal Role, Breastfeeding, and Bonding, as well as with questions regarding Management and Adherence to Therapeutic Regime. Self Care: Hygiene, Pressure Ulcer and Family Caregiver Role, ICNP© Focus with consensus in health center, are also relevant in the hospital.

Table 2 lists the ICNP© Focus for which consensus was achieved by the hospital nurses.

Table 2 – Consensus ICNP© Focus – hospital nurses

<table>
<thead>
<tr>
<th>ICNP© Focus</th>
<th>Concordance (%)</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway Clearance</td>
<td>88.43</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pressure Ulcer</td>
<td>86.07</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Macerabon</td>
<td>80.65</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Self Care: Hygiene</td>
<td>78.47</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Turning of own body</td>
<td>78.14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Ulcer</td>
<td>77.68</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Caregiver Role</td>
<td>76.44</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pain</td>
<td>75.90</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

Of note, the analysis of the data from the first questionnaire showed that hospital nurses were especially concerned about certain ICNP© Focus that are associated with complications prevention and control, as Pressure Ulcers or Pain, strongly related with diseases that determine hospital admissions.

Types of nursing indicators

Three major types of nursing indicators were identified and drafted by focus group participants as important indicators of quality nursing practice: Nursing diagnoses frequencies; Health gains sensitive to nursing care, and Risk prevention indicators.

The first type of nursing indicator that was seen as being very important was Nursing diagnoses frequencies. In hospitals, they represent the relative
frequency over a period of time of episodes of particular conditions represented by specific nursing diagnoses developed by patients. For instance: Pressure ulcer frequency; Falling frequency; Frequency of Family Caregiver’s skill learning to feed the patient, not demonstrated; Frequency of Dependency in Self Transferring, etc. It is important to note that, in the actual NIS in use in these hospitals and health centers, the nursing diagnoses are pre-determined combinations of ICNP© terms. Thus, each nursing diagnosis documented in the patients’ record has the same identification code, even if some free text or other ICNP© terms are added to the original sentence. In the health centers, Nursing diagnosis frequencies represent the relative frequency over a period of time of patients with particular conditions represented by specific nursing diagnoses.

Health gains sensitive to nursing care represent the positive evolution or resolution of a previous negative condition as reflected by a particular nursing diagnosis in the health record. For example, when the nursing diagnosis Dependency in Self Transferring, to a very high degree was documented, and then subsequently Dependency in Self Transferring, to a lesser degree was documented, the last statement documented during the period of time or during the same episode dealing with the same Focus (Self-Care: transferring) represents a positive evolution; when the last statement documents that the problem has ended, this represents resolution. The focus group frequently emphasized that these types of health gains would represent many positive evolutions in the knowledge and abilities of patients, family caregivers or parents. It is also important to emphasize that the focus group assumed that positive evolutions in knowledge and abilities were considered to be health gains.

Since clinical situations that represent undesirable nursing phenomenon estimated to occur with a certain probability, that is, making a risk diagnosis, are very important, the focus group decided to define two sub-categories of nursing indicators within this type: Effectiveness of diagnosing risk and Effectiveness of risk prevention.

Effectiveness of diagnosing risk represents the accuracy with which nurses identify patients who are at risk of experiencing a negative impact on their health status; it represents the percentage of patients identified as being at risk of the total number of patients who subsequently experienced the negative impact. In hospital settings the indicator refers to episodes, and in health centers, it refers to patients. Effectiveness of diagnosing risk is a process indicator intimately related with Effectiveness of risk prevention - outcome indicator -, because it is not reasonable to effectively prevent something that one has not previously diagnosed. Make a clinical judgment about a potential (Risk) nursing diagnosis adequately is a nursing process element that strongly influences patients’ outcomes and nursing care quality.
Effectiveness of risk prevention represents the accuracy of nurses preventing the development of a negative impact that was previously identified by a risk nursing diagnosis; it represents the percentage of patients that experienced the event of the total number of patients who were previously identified as having the risk nursing diagnosis.

The second questionnaire answers’ analysis shows that the different nursing indicators useful in the hospital and health centers are consistent with the consensus obtained at Delphi survey first round. In the hospital, nursing indicators associated with complications prevention and Self-care promotion are more useful. In health centers indicators linked with knowledge and abilities acquisition regarding Management and Adherence to Therapeutic Regime, Parental role and Family Caregiving are relevant.

These nursing indicators can be classified as “Client-focused”, because they explain health and dependency status; clients (patients, family caregiver and parents) knowledge and abilities acquisition, as abilities to perform self-care; but also complications prevention and symptoms control.

**Items of information for the NMDS**

After defining the different types of nursing indicators that were needed, the focus group started working on the specific information need for those indicators production. The items of nursing clinical data – nursing diagnoses, interventions and outcomes - included in NMDS are guided to 214 nursing indicators, which were defined using 35 ICNP© Focus:

- **Functions**: Expectoration, Aspiration, Dehydration, Pressure Ulcer, Joint Contracture, Foot drop, Pain, and Constipation;
- **Reasons for action**: Knowledge, Skill Learning, Caregiver Stress, Acceptance of Health Status, Self Control: Infection, Self Control: Urinary Incontinence, Self Control: Bowel Continence, and Self Control: Pain;
- **Self-Reliant Actions**: Self Care: Hygiene, Self Care: Putting on Clothes, Self Care: Feeding, Self Care: Toileting, Self Transferring, Self Turning, Walking, Falling, Contraceptive Use, Compliance - Therapeutic Regime, Management of Therapeutic Regime, Immunization Behavior, Self Screening, and Health Seeking Behavior;
- **Interactions and Family Processes**: Parental Role, Caregiver Role, Breastfeeding, Family Planning, and Pregnancy – Adaptation.

The table below lists the items of nursing clinical information that were
needed, for instance, to the production of indicators related with Independence gains in Self Transferring.

Table 3 – Items of clinical information associated with the indicator -
“Gains in Independency in Self Transferring”

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency in Self Transferring, to a lesser degree</td>
<td>Teach the patient about self-care: transferring strategies</td>
</tr>
<tr>
<td>Dependency in Self Transferring, to a moderate degree</td>
<td>Advocate the use of adaptation equipment for self transferring</td>
</tr>
<tr>
<td>Dependency in Self Transferring, to a high degree</td>
<td>Inform the patient about adaptation equipment for self transferring</td>
</tr>
<tr>
<td>Dependency in Self Transferring, to a very high degree</td>
<td>Instruct the patient about adaptation strategies for self transferring</td>
</tr>
<tr>
<td></td>
<td>Guide the patient in the use of adaptation equipment for self transferring</td>
</tr>
<tr>
<td></td>
<td>Provide adaptation equipment for self transferring</td>
</tr>
</tbody>
</table>

In this moment, all hospitals wards and health centers that use the nursing indicator - “Gains in Independence in Self Transferring” – incorporate in their NIS the clinical data that are presented in table 3.

Finally, the focus group defined other elements beyond the nursing diagnoses, outcomes, and interventions that should be part of the NMDS (Table 4 on next page).
The elements incorporated in NMDS content, beyond nursing clinical data, include patients’ socio-demographic characteristics, care setting elements and time elements (e.g., care episode start and stop dates), according with iNMDS recommendations.9

**Discussion**

Within this stage of the larger research task, a "set of items of information with uniform definitions and categories concerning the specific dimension of nursing which meets the information needs"6 of nurses at the point-of-care was identified. By identifying the substantive structure of the NMDS proposed, the set of information items selected has the potential to produce the different types of nursing indicators that were defined. It is clear that, with the same NMDS, many different queries can be made using the data, and, by doing so, nursing indicators other than those defined could be extracted.

The focus group defined three types of indicators. Nursing diagnoses frequencies are a relevant type of indicator, as they express the health needs of a population in terms of nursing care. After being calculated at the level of the hospital ward or health center, nursing diagnoses frequencies can be aggregated at the institutional, regional, national, or even international level.16 In each hospital ward or health center, after determining the most frequent nursing diagnosis it is necessary to reflect on the Health gains sensitive to nursing care. Thus, Health gains sensitive to nursing care represent positive evolution or resolution of a previous negative condition expressed by a particular nursing diagnosis as a predictable effect of at least one documented nursing intervention. This would help nurses clarify the scope of nursing and

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Table 4 – NMDS Socio-demographic and Care setting elements

<table>
<thead>
<tr>
<th>NMDS - Other elements</th>
<th>Care setting elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-demographic elements</strong></td>
<td><strong>Care setting elements</strong></td>
</tr>
<tr>
<td>Residence</td>
<td>Identification code</td>
</tr>
<tr>
<td>Year of birth</td>
<td>Clinical service type</td>
</tr>
<tr>
<td>Gender</td>
<td>Care episode start date</td>
</tr>
<tr>
<td>Reason for admission (in Hospital)</td>
<td>Care episode stop date</td>
</tr>
</tbody>
</table>
change care processes in order to improve the quality of nursing care\textsuperscript{23 - 25}. During this stage of focusing on nursing practice, the importance of Knowledge and Skill learning emerged as pillars of health gains that were sensitive to nursing care. This assumption is, in our view, of particular importance to nursing practice. Specifically, when the nursing diagnosis was linked to nursing interventions, the relevance of the group of nursing interventions belonging to the ICNP\textsuperscript{©} Informing type of action was evident.

Many focus groups discussions dealt with Risk prevention indicators. Since this issue has obvious importance to clinical practice, and since there are many different approaches, such discussions must be ongoing. Nevertheless, a synthesis was achieved that, after reviewing the frequencies of nursing diagnoses in areas related to risk prevention (for instance: pressure ulcer frequency), it is necessary to determine to what extent nurses can identify in a timely manner those patients who are at risk, which is the Effectiveness of diagnosing risk. The importance of this kind of indicator is related to the assumption that one cannot effectively prevent something that one has not previously diagnosed. However, it is also important to be aware of the extent to which one can effectively prevent negative outcomes, which is the Effectiveness of risk prevention. Effectiveness of risk prevention represents the accuracy of nurses to prevent a negative outcome that was previously identified with a risk nursing diagnosis by at least one nursing intervention that has a predicable effect on the desired outcome.

The ICNP criteria selected by the focus group to structure nursing indicators could be aggregated in the following four domains: Parenting, Family Caregiver, Self-Care (including therapeutic regime), and Prevention of Body Processes Complications. We found that all of these domains are represented in hospitals and health centers by specific nursing indicators. It was also interesting to observe that when the autonomous area of nursing was considered in order to define health indicators sensitive to nursing care\textsuperscript{26, 27}, the concept of "Human responses" emerged. Of course, nursing care affects health indicators other than those mentioned here. However, the indicators identified here have a common particularity, in that the initial statement that describes the health condition that triggers the care process is a nursing diagnosis. This issue is very relevant with respect to the actual context of nursing in Portugal, since professional regulation specifies two types of nursing interventions: interdependent interventions and autonomous interventions. Thus, the focus group intentionally focused on the autonomous area of nursing.

Another concern of the focus group was to be cognizant of current standards when defining an iNMDS\textsuperscript{9}. Thus, the elements incorporated in the NMDS respected those standards.
Conclusion

As part of a larger ongoing research project, this stage aimed to define the substantive material of the NMDS. The second stage is focused on the production of these indicators using the data obtained from the same hospitals and health centers. This information will be valuable for identifying new approaches to nursing-care quality management. There is great value in reflecting about practices based on valid information so as to produce changes that are not only innovations.

The strategy that was used to define the indicators, which involved defining the NMDS by involving nurses directly involved in patient care, highlights the risk of using a top-down approach; if indicators are defined to serve top-level decision-making, much valid information will be invisible to nurses at the point-of-care. On the other hand, our strategy supports the production of another type of information through the use of different strategies to aggregate the same data based on the NMDS presented. At the end of this stage, one can already see the enormous value of having well structured data that would permit research about nursing care to move nursing forward as a knowledge discipline.

Since many software companies are developing different informatics solutions, there is an immediate need to establish the health data that must be recorded based on certain standards in order to have valid information about health care. This research, by proposing an NMDS for Portugal, represents an attempt to prevent nursing data from being indistinguishable within large databases. Thus, the indicators defined, as well as the NMDS, were formally given to the Northern Department of the Ministry of Health and to the Institute of Health Information. The project is being closely followed by the Portuguese Nurses Association that recently developed a position dealing with nursing information systems, including an NMDS. Presently, this study’s findings represent the core of the contents and strategies proposed by the Portuguese Nurses Association to Portuguese NMDS.
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