Review

Standards for Nursing Terminology

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Abstract Terminology work in nursing has given rise to an increasing number of nursing terminologies. These generally take the form of controlled vocabularies. Because of the limitations of the controlled vocabulary approach, individual terminologies tend to be tuned to meet the specific needs of their intended users. Differences between terminologies are now a significant barrier to the comparison and interchange of health information. To agree on a single, multi-purpose terminology would be problematic. However, several options for resolving unnecessary differences between nursing terminologies are currently being explored by international standards bodies and other groups, such as the U.S. Nursing Vocabulary Summit. One such option is the use of a terminology model to facilitate evolution toward a more coherent range of terminologies. The authors describe the motivation behind the development of a standard for nursing terminologies. They explain how a terminology model might form the basis for such a standard through a description of the approach taken by CEN TC251 (the Health Informatics Technical Committee of the European Committee for Standardization). They also discuss possible limitations of standardization.


This review provides an overview of terminology work in nursing. It presents the case for a standard for nursing terminology and contrasts the various forms such a standard might take. It concludes with an overview of current standard formulation efforts in this area and discussion of the limits of standardization.

Background

Information has always been a vital component of health care. Since the 1970s, health care information systems have supported the drive to manage resources more efficiently. This continuing industrialization of health care places increasing demands on information. Information must be available and accessible to more people, it must have a life span that goes beyond the clinical encounter, and it must serve many different purposes. In the last decade, the growth of communication technologies has extended the role of health-related information even further, to include the management of knowledge for use by both health care professionals and service users.

Speech, handwriting, and text are very powerful and flexible representations that require no change in the way we think about information. Unfortunately, these traditional currencies, notwithstanding notable advances in natural language processing, can no longer meet the current and future demands placed on information. This shortcoming, among others, has contributed to the development of a number of terminologies for health, i.e., controlled vocabularies, classifications, nomenclatures, and thesauruses.

Terminological work in nursing has been going on for a number of years, with perhaps the greatest thrust occurring in the early 1990s. At that time, several factors, in addition to the problems associated with natural language, seemed to conspire to provide a particularly fertile ground for the development of terminologies. These included:
The need to quantify nursing for the management of resources

The development of the electronic patient record

The development of knowledge bases and the growth of evidence-based practice.

Above all, there has been a desire to ensure the visibility of nursing in health care systems, the development of systems that support the work of nurses in a multidisciplinary service, and the representation of the contribution of that work in aggregated health care information.

Until relatively recently, the only available and usable technology for structuring terminologies was what is called termed the controlled vocabulary. It is not surprising, therefore, that the majority of nursing terminologies were, and still are, based on this approach. (See Hardiker and Rector for a discussion of more recent approaches.)

A controlled vocabulary is a restricted set of phrases, generally enumerated in a list and perhaps arranged into a hierarchy. Examples in nursing include the North American Nursing Diagnosis Association (NANDA) Taxonomy I, the Nursing Interventions Classification (NIC), and the Georgetown Home Health Care Classification (HHCC). The apparent simplicity of lists makes them very attractive. However, a number of problems are associated with lists. Health care in general, and nursing in particular, demand a large amount of detailed information. A huge number of individual phrases would be needed to represent all possible information. But the constraints imposed by development and by look-up at the user interface mean that the number of phrases in a controlled vocabulary must be limited. For example, NANDA includes the diagnoses Pain and Chronic Pain with no mention of important modifiers such as severity or location.

We cannot expect a single controlled vocabulary to describe patient care, to populate aggregated data sets for management purposes, to capture the processes of care in messages, and so on. Thus, controlled vocabularies tend to be tuned to a single purpose or group of closely-related purposes. This is borne out in practice. The HHCC has been criticized for lacking the specific vocabulary of acute care, and NANDA has been criticized for not covering all fields of specialty practice.

The division between so-called user interface terminologies and terminologies for natural language applications represents another aspect of the problem. To draw an analogy, it is difficult to imagine writing a novel using a phrase book; it is equally difficult to imagine constructing such a sophisticated phrase book in the first place. In contrast, it is not difficult to imagine constructing and using a reduced phrase book for ordering food in a restaurant, but this may not help a tourist catch a bus to the airport.

In 1994, the American Nurses Association Steering Committee on Databases to Support Clinical Nursing Practice recognized four different but closely related terminologies for use in national databases in the United States. Since then, the number of different specialized terminologies, such as the perioperative nursing data set, has increased. This is not an indication of the inadequacy of any particular terminology, but rather a fundamental limitation of the controlled vocabulary approach.

Depending on the degree of consensus, a single terminology may be used across a locality, across a region, or even across a nation. However, the same terminology will not necessarily be used in a different locality, region, or nation. The overlap between different terminologies might be great, but we are not able to see this overlap without human intervention, i.e., we cannot automatically compare items such as the HHCC intervention Abuse Control and the NIC intervention Abuse Protection. We are not able to make use of the similarities and resolve the differences between diverse terminologies.

Although individual terminologies might be useful, even indispensable, to some users, we cannot hope, with such a plethora of different systems, to communicate effectively, share information, build integrated record systems, and make sense of health care at a more global level. Yet this is exactly what current health care demands.

The Need for a Standard

Clearly, there is a need in nursing, as in other areas of health care, for a mechanism to resolve the problems resulting from the use of diverse terminologies—a need for a standard. A standard would offer:

- Enhanced quality, by ensuring that terminologies are developed using tried and tested methodologies
- Reduced effort, by avoiding reinvention of the wheel
- Greater coherence and a mechanism for convergence between terminologies
- Compatibility, by ensuring the integrity of data aggregated across different source systems.

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We agree with the view that at the heart of health informatics standards are requirements for comparability and interchange of health information. Before discussing the precise nature of a standard for nursing terminologies, we need a clear statement of the current situation. We believe that the following statement adequately summarizes the problem:

**Differences** between individual nursing terminologies prevent direct comparison and exchange of nursing information.

This view is shared by a number of authors, and the problem is seen as significant. For example McCormick et al.\(^1\) state that “… comparative data are critical for outcomes analysis.”\(^1\)

A standard could take different forms, depending on which aspect of the problem it is intended to address. Possible approaches are discussed in the following paragraphs.

### Agree on a Single, Multipurpose Terminology

As the problems described previously stem from the use of multiple terminologies, it might seem reasonable to develop or decide on a single terminology. A number of problems are associated with this approach:

- To develop a terminology that could meet all the needs of its users is an attractive goal. Despite significant achievements, it is a goal that continues to elude the nursing informatics community, perhaps because it may not be achievable. Terminologies represent, at best, partial solutions.\(^1\)
- To get anything other than local agreement on such a terminology would be highly problematic. See, for example, the description of the submission of NANDA to the World Health Organization Collaborating Center.\(^1\)
- To take such a course of action would be to deny the value of data already captured using other existing terminologies. We believe that any solution to the terminology problem should help to “unlock” this historical data.

### Resolve Differences Between Individual Terminologies

A less revolutionary approach would be to allow a range of complementary terminologies and accept the inevitable differences between them.\(^1\) The

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\* It should be noted that the “users” of such an approach would be terminology developers and not terminology end-users.

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**Current Standardization Efforts**

The approach taken by CEN TC251 (the Health Informatics Technical Committee of the European Committee for Standardization) is to allow for multiple specialized terminologies that comply with a common intermediate structure. The ultimate goal is for compatibility, not uniformity. Central to the work within CEN is the idea of a categorial structure.\(^15\) A
categorial structure is a terminology model that describes the high-level semantic structure in a particular subject field. For example, a categorial structure on Nursing Interventions might include the categories <informing> (which groups together descriptors such as teaching) and <condition> (which groups together descriptors such as diabetes). The categorial structure might also specify how these categories might be combined. For example, <informing> might be related to <condition> by a link, has topic. Such a structure would allow a terminological phrase such as “teaching about diabetes” to be represented in a common form. A more detailed technical discussion of categorial structures is outside the scope of this paper; however, more detail can be found in Rossi Mori et al.16

The approach seeks to provide a broad, nonrestrictive common framework for the representation of health-related concepts. As mentioned earlier in this paper, standards can reduce duplication of effort by providing a tried-and-tested resource. To this end, categorial structures might be used in the development and maintenance of individual terminologies by making the underlying semantics explicit, by driving production to a more principled organization, and by generating items for inclusion.

More recently, the approach has been extended to include not only the terminological component of health records but also the structure of clinical information in health records, information models, and data dictionaries. This generalization of categorial structures takes the form of a model that describes the properties of a particular subject field, without any assumption about how the various parts will be represented. In this way it seeks to provide a bridge between terminologies, terminology models, information models, and the semantics of health records.

The CEN/TC251 is currently applying this approach through a coordinated program of work items. Each work item has as its focus a particular aspect of health care, such as surgical procedures or continuity of care. Nursing is represented through a work item, Health Informatics—System of Concepts to Support Nursing. The Health Informatics Technical Committee of the International Organization for Standardization (ISO) has a related work item. The ISO work item, Integration of a Reference Terminology Model for Nursing, is an attempt to define a wider international terminology model for nursing and harmonize the model with models representing other aspects of health care. Inevitably, when the ISO work item commences, it will draw heavily on the work done in CEN and on the results of other initiatives, such as the U.S. Nursing Vocabulary Summit. The U.S. Nursing Vocabulary Summit is made up of terminology developers, terminology standards developers, and representatives of professional organizations, health care enterprises, federal agencies, and the health informatics industry. One of purposes of the Summit is to assess the feasibility of and identify the requirements for the development a terminology model for the United States.17

Preliminary CEN work on nursing has included a short strategic study.18 The scope of the study was to develop a strategy for the CEN TC251 work on nursing terminology by examining the problems arising from performing two very preliminary cycles of development of a categorial structure. In the first cycle, a set of existing terminologies was used in the development of an interim categorial structure. In the second cycle, four different terminologies were used as examples for validation and refinement of the categorial structure. The study includes a number of recommendations:

- **Clarify scope and purpose.** Terminology models are a relatively new concept in the health care domain. Their potential has not yet been realized or demonstrated. Until it has, realistic goals need to be maintained and user expectations managed accordingly.

- **Establish processes for refinement.** Gold is unlikely to be struck in the initial stages of the work. Therefore, the framework within which the work is carried out must be flexible and adaptable to change. To facilitate this process, a more systematic methodology and supportive tools are needed.

- **Involve the wider international nursing community.** A great deal of relevant work is being done throughout the world, as shown by the products of the U.S. Nursing Vocabulary Summit. It will be important to include this work in both the CEN work item and the ISO work item. It is equally important to represent the views of a wider community of experts.

**Limits of Standardization**

A number of factors limit the scope, level of granularity, degree of consensus, and progress of any proposed standard.

Standardization can be considered a process of formalization, which, like any such process, has con-
straints on what is desirable and achievable. Much of health care communication will always be informal, for example, conversations and written comments that serve some short-term purpose. The challenge is to identify where formalization is not just feasible but desirable.

Once an appropriate scope has been established, the issue of granularity arises. We could struggle for a long time to agree on a level of detail that might be irrelevant in five years time, even assuming that we should be trying to standardize for a functionality over-and-above what we can currently achieve. Any standard that can be applied internationally across a domain as diverse as nursing must necessarily be broad and must exist at a level that takes into account very different world views. But within the current framework is a need for a task-oriented approach to standards generally and to nursing standards in particular. For example, we need to investigate what standards are needed, not just to allow comparison and exchange of information but to ensure that quality assurance, risk monitoring, communication between nurses, and such are possible.

There appears to be a degree of consensus on the ultimate goals for standards for nursing terminologies. While some would argue that this has not been easy to achieve, an even more daunting task awaits us: to agree on content. Patterson and Huff have stated that the key to successful standards is not to let “perfect” get in the way of “good.” The implication is that if something works, then it should be welcomed, despite its shortcomings. If there is room for significant misunderstanding in extended free-text notes, why then do we think we must strive for or could achieve perfect agreement in artificial terminologies and terminology models? To strive for perfection at this initial stage of standards development would be to invite failure, in terms of both development and application.

Standardization is subject, of course, to more pragmatic constraints, in that it requires considerable resources and scarce expertise. This will necessarily limit the aims of the process.

Conclusion

A number of standards organizations, such as CEN, ISO, and the U.S. Nursing Vocabulary Summit, are currently working collaboratively toward developing standards for nursing terminologies. These groups share a common immediate goal: to facilitate the comparison and exchange of nursing information. The hope is that this will lead to greater coherence, not only between nursing terminologies but also between nursing terminologies and terminologies used in other areas of health care. Despite significant achievements, the work is still at an early stage. The test in the long term for whether standards for nursing terminologies work will be the extent to which nursing information that has been captured using compliant terminologies can be directly compared and exchanged. In the shorter term, the emerging standards and the work to develop them are demonstrating the necessity of collaboration in the evolutionary process of convergence.

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References


