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An International Standard for Nursing Terminologies

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Abstract

The plethora of nursing terminologies in use across the world has motivated the development of an International Standard (ISO FDIS 18104) for statements describing nursing diagnoses and nursing actions. The Standard has the potential to enhance the quality of individual terminologies, to promote consistency across a range of terminologies, to facilitate re-use in terminology development and to support integration with terminologies used in other domains. The Standard represents a significant achievement. However, attention must now turn away from consensus building and towards practical application. This paper presents an overview of the Standard and argues the need for further work around tools, validation and user guidance.

Introduction

A number of nursing terminologies are currently in use across the world. Many of these have originated in the United States [1], and these are among the most commonly reported. There are however many others, perhaps less well-publicised but no less well-used, that have been developed to satisfy local need [2]. A number of factors have accounted for this global proliferation. These include but are not limited to:

- The development of electronic patient records
- The desire to ensure the visibility of nursing within broader health care systems
- The need to quantify nursing as a resource
- The growth of evidence-based practice, the development of nursing knowledge and the need for more effective indexing [3]

Whatever the motivation, the result is a plethora of terminologies, with many commonalities, but also with many differences. Many of these terminologies have been developed to fulfill a number of functions; others are relatively purpose-specific.

In response to these issues, a number of investigators have argued the need for a standard a) to ensure consistency across the range of nursing terminologies, b) to limit re-invention and facilitate re-use, c) to support integration with terminologies from other domains and d) to improve quality [3, 4]. This work has now come to fruition in the form of a Final Draft International Standard, developed under the banner of the International Organization for Standardization (ISO) [5]. The

Standard builds upon work carried out previously within the European Committee for Standardization (CEN) [6]. The purpose of this paper is to present an overview of the Standard and to discuss its potential uses and limitations.

Content of the Standard

The title of the Standard, 'Integration of a reference terminology model for nursing', reflects an intention to move towards a more comprehensive terminology for health care. The work has been undertaken by a group of experts within ISO Technical Committee 215 (Health Informatics) Working Group 3 (Health Concept Representation) under the collaborative leadership of the International Medical Informatics Association - Nursing Special Interest Group (IMIA-NI) and the International Council of Nurses. The purpose of the Standard is given as: 'The purpose of this International Standard is to establish a nursing reference terminology model consistent with the goals and objectives of other specific health terminology models in order to provide a more unified reference health model...' [5, p.1]. The definition for a reference terminology model is given as a 'domain concept model...that is optimised for terminology management' [5, p.2]. A domain concept model is in turn defined as a 'set of formal categories, semantic links and sanctions describing potential characteristics for representing concepts in a domain' [5, p.2]. Two models are presented within the Standard: a model for nursing diagnoses (Figure 1) and a model for nursing actions (Figure 2).

Reference terminology model for nursing diagnoses

The description of the models that follows uses the same editorial conventions as the Standard: Semantic domains are likened to abstract classes of UML that are used as organising categories to simplify the models. They are italicised in the diagrams and their labels are enclosed in double angle brackets within the text <<like this>>. Semantic categories are likened to instantiable classes in UML. Their labels are in plain font in the diagrams and they are enclosed in angle brackets in the text <like this>. Within the Standard, a nursing diagnosis is considered either as a <<judgement>>

(e.g., decrease) on a <<focus>> (e.g., body temperature) or as a <<judgement>> on a particular <dimension> (e.g., ability, knowledge) of a <<focus>> (Figure 1). A descriptor for <<focus>> and a descriptor for <<judgement>> are considered mandatory for the intensional definition of a nursing diagnosis. However, in certain instances, a single descriptor (e.g., anxiety) can serve the role of both <<focus>> and <<judgement>>. No base category is specified; the decision is at the discretion of the terminology developer and/or implementer. Descriptors for other semantic domains (i.e., <<subject of information>> and <<site>>) and qualifiers (e.g., timing) are used as necessary to support or enhance the intensional definition of a specific nursing diagnosis.

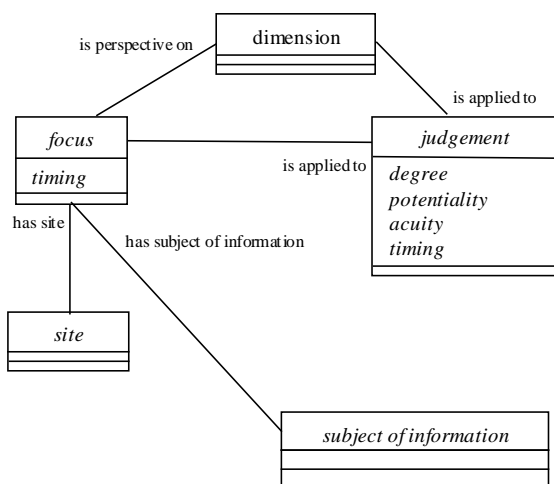


Figure 1 – Reference terminology model for nursing diagnoses [5, p.3]

An example of a valid decomposition or ‘dissection’ of the nursing diagnosis ‘risk for impaired skin integrity’ might be:

skin integrity		<<focus>>
has judgement	impaired	<<judgement>> linked to <<focus>>
has potentiality	risk for	potentiality qualifier linked to <<judgement>>
has subject of information	client	<<subject of information>> linked to
		<<focus>>

Reference terminology model for nursing actions

Within the Standard, a nursing action is considered as an intentional act applied to a <<target>> (e.g., blood pressure) through an <action> (e.g., monitoring) (Figure 2). A descriptor for <action> and a descriptor for <<target>> are considered mandatory for the intensional definition of a nursing action. Descriptors for other semantic domains (i.e., <<site>>, <<recipient of care>>, <<means>>), semantic categories (i.e., <route>), and qualifiers (i.e., timing) are used as necessary to support or enhance the intensional definition of a specific nursing action.

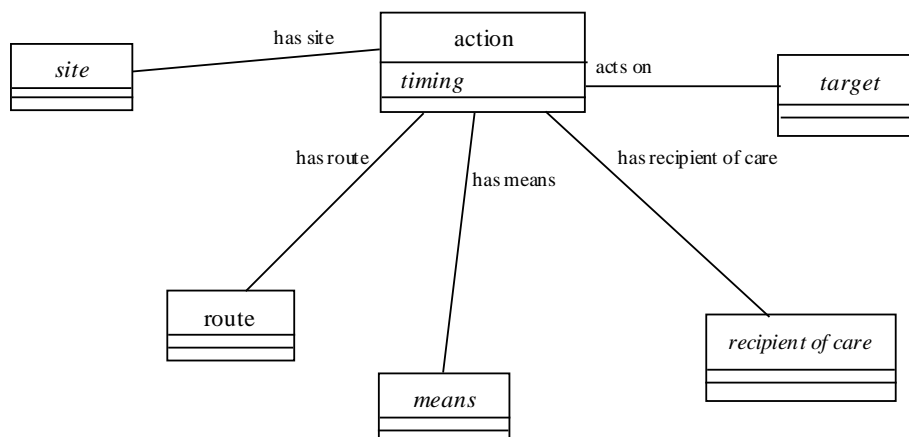


Figure 2 – Reference terminology model for nursing actions [5, p.6]

An example of a valid decomposition of the nursing action ‘administer insulin’ might be:

administering		<action>
acts on	insulin	<<target>> linked to <action>
has recipient of care	client	<<recipient of care>> linked to <action>

Uses and limitations of the Standard

As with all standards developments, one of the major goals of the work has been to gain consensus among its major stakeholders. Such a process is never easy. The speed with which this Standard has been developed, and the level of agreement reached in that time is a credit to the developers of the Standard (it may also be indicative of a general level of agreement across the nursing community about the nature of nursing and the terms used to describe it).

The Standard is in the final stages of acceptance, and attention must now turn to implementation. The remainder of this paper discusses issues around practical use of the Standard.

1. As the examples given previously demonstrate, the Standard gives guidance on and can support the decomposition of existing nursing diagnosis and nursing action statements. These decompositions could, it is claimed, facilitate computer-based processing due to their compositional nature. However, it should be noted that neither the Standard, nor any decompositions made alone are sufficient to support computer-based processing. Relatively sophisticated software tools are also needed that can manage and manipulate the decompositions. Further investigation into this new area of ontology management is needed before this claim can be substantiated.
2. It is suggested that the Standard might also facilitate the systematic evaluation of existing terminologies i.e., decompositions that do not comply with the Standard may indicate an anomaly within a particular terminology. So, for example, a proposed nursing diagnosis statement might be considered to be valid only if its decomposition complies with the nursing diagnosis model. Thus, statements such as the Home Health Care Classification nursing diagnosis 'Skin incision', defined as 'Cutting of the integument', would be excluded. This may help terminology developers to refine their terminologies by identifying candidate problem statements. Of the purported uses, it is in this systematic evaluation of existing terminologies that the Standard might provide the most immediate and accessible utility. However, although the Standard presents a range of example decompositions, additional validation work is needed on a more comprehensive scale to ensure that the

Standard, and the models it embodies, are truly representative of the universe of acceptable nursing diagnosis and action statements, and that potentially valid statements are not erroneously excluded due to non-compliance. Further work is also needed to ensure consistency in decomposition; it is highly unlikely there will be only one way to represent a particular statement. As an obvious example, the diagnostic statement ‘increased body temperature’ might be analysed into the following decomposition:

increase

is applied to body temperature

The same statement could also be analysed into:

body temperature

has judgement increased

This inconsistency arises as a result of there being no predetermined base category. Another problem area might be in those special cases where a concept can take the role of <<judgement>> and <<focus>> simultaneously e.g., anxiety. Guidance, perhaps in the form of a style guide, is needed to ensure consistency between modellers.

3. In addition to decomposition, it is claimed that the models might also support the generation, in regular form, of composite nursing statements i.e., terminology developers could use the models to ensure consistency in emerging terminologies. However, the models within the Standard are necessarily very general in nature, allowing much potential ‘freedom of expression’. Following on from a previous example, the nursing diagnosis model would allow the generation of both ‘increase in body temperature’ and ‘body temperature increased’; logically these are different concepts – one is an increase and one is a body temperature - but they are probably intended to mean the same thing. Without further direction on how to generate composite expressions, consistency will inevitably be compromised with associated redundancy.

4. In addition to supporting the composition and decomposition of composite nursing diagnosis and nursing action statements, other uses suggested within the Standard include:
 - facilitating the mapping among nursing diagnosis and nursing action statements
 - enabling appropriate integration with other reference terminology models and with information models.

While this latter use is perhaps realistic – the Standard at least provides a vocabulary for mediation between terminology developers and the developers of information systems – the ability of the Standard to facilitate mapping is more questionable. In order to support anything other than a cursory mapping, further work is needed. Problems might arise from factors such as:

- a) The flexibility permitted by the Standard when decomposing statements i.e., there may be more than one Standard-compliant way of decomposing a particular statement, as a previous example demonstrates - the two decompositions given as examples in point 2 above logically do not map; any mapping would require manual intervention. This is compounded by the fact that the Standard does not include a fixed set of descriptors and it is left to the modeller to resolve any linguistic issues, such as synonymy.
- b) A fixed level of granularity within the models i.e., the Standard does not include any notion of hierarchical ordering, either in descriptors or in semantic categories. Thus decompositions can only map at the relatively abstract level dictated by the models. So for example, according to the nursing action model, and putting aside any consideration of descriptors, there would be a valid mapping between decompositions for the very different action statements ‘supply management’ and ‘cough enhancement’ i.e., they both comprise an <action> and a <<target>>.

It is clear that in its current form, using the Standard alone to map between statements would be in many cases ineffectual.

Conclusion

The Standard 'Integration of a Reference Terminology Model for Nursing' is the culmination of several years' effort and represents a significant achievement. It has the potential to enhance the quality of existing and emerging terminologies and to raise consistency to a level that may ultimately facilitate convergence. However substantial further work is needed.

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References

- [1] <http://www.ana.org/nidsec/nilang.htm>.
- [2] Ehrenberg A, Ehnfors M, Thorell-Ekstrand I. The VIPS model -- implementation and validity in different areas of nursing care. In: Gerdin U, Tallberg M, Wainwright P, editors. Proceedings of Nursing Informatics '97; Amsterdam: IOS Press; 1997. p. 408-410.
- [3] Hardiker N, Hoy D, Casey A. Standards for Nursing Terminology. Journal of the American Medical Informatics Association 2000;7(6):523-528.
- [4] Chute C. Standards Move to Center Stage. MD Computing 1999;16(1):29-32.
- [5] FDIS18104. Health Informatics - Integration of a Reference Terminology Model for Nursing. Geneva: ISO; 2003.
- [6] CENENV14302:2000. Health Informatics - System of concepts to support nursing. Brussels: CEN; 2000.