



Mapping the Dutch SNOMED CT subset to Omaha System, NANDA International and International Classification of Functioning, Disability and Health

R.A.M.M. Kieft^{a,*}, E.M. Vreeke^b, E.M. de Groot^c, H.I. de Graaf-Waar^d, C.H. van Gool^e, N. Koster^f, H. ten Napel^e, A.L. Francke^{g,h}, D.M.J. Delnoij^{i,j}

^a Dutch Nurses' Association, PO Box 8212, 3503 RE Utrecht, Netherlands

^b Nursing Healthcare Innovation Technology Platform of the Dutch Nurses' Association, PO Box 8212, 3503 RE Utrecht, Netherlands

^c Nictiz, Dutch National Release Centre for SNOMED CT, PO Box 19121, 2500 CC The Hague, Netherlands

^d Dutch Association for Nursing Diagnosis, Interventions and Outcomes, Amsterdam, Netherlands

^e WHO Collaborating Centre for the Family of International Classifications in the Netherlands, National Institute for Public Health and the Environment, PO Box 1, 3720 BA, Bilthoven, Netherlands

^f Terminology Management of the Omaha System (NL version), University of Twente, Netherlands

^g Netherlands Institute for Health Services Research (NIVEL), PO Box 1568, 3500 BN Utrecht, Netherlands

^h EMGO+ /VU Medical Center, Department of Public and Occupational Health, Van der Boechorststraat 7, 1081 BT Amsterdam, Netherlands

ⁱ Transparency in Healthcare from the Patient's Perspective, Tranzo, Tilburg University, PO Box 90153, 5000 LE Tilburg, Netherlands

^j National Health Care Institute, PO Box 320, 1110 AH Diemen, Netherlands

ARTICLE INFO

Keywords:

SNOMED CT subset of patient problems
Mapping
Classifications

ABSTRACT

Background: Nurses register data in electronic health records, which can use various terminology and coding systems. The net result is that information cannot be exchanged and reused properly, for example when a patient is transferred from one care setting to another. A nursing subset of patient problems was therefore developed in the Netherlands, based on comparable and exchangeable terms that are used throughout the healthcare sector and elsewhere (semantic interoperability).

The purpose of the current research is to develop a mapping between the subset of patient problems and three classifications in order to improve the exchangeability of data. Those classifications are the Omaha System, NANDA International, and ICF (the International Classification of Functioning, Disability and Health).

Method: Descriptive research using a unidirectional mapping strategy.

Results: Some 30%–39% of the 119 SNOMED CT patient problems can be mapped one-to-one from the subset onto each separate classification. Between 6% and 8% have been mapped partially to a related term. This is considered to be a one-to-one mapping, although the meanings do not correspond fully. Additionally, 23%–51% of the patient problems could be mapped n-to-one, i.e. more specifically than the classification. Some loss of information will always occur in such exchanges. Between 1% and 4% of the patient problems from the subset are defined less specifically than the problems within the individual classifications. Finally, it turns out that 9%–32% of the terms from the subset of patient problems could not be mapped onto a classification, either because they did not occur in the classification or because they could not be mapped at a higher level.

Conclusion: To promote the exchange of data, the subset of patient problems has been mapped onto three classifications. Loss of information occurs in most cases when the patient problems are transformed from the subset into a classification. This arises because the classifications are different in structure and in the degree of detail. Structural cooperation between suppliers, healthcare organisations and the experts involved is required in order to determine how the mapping should be used within the electronic health records, and whether it is usable in day-to-day practice.

* Corresponding author.

E-mail addresses: r.kieft@venvn.nl (R.A.M.M. Kieft), info@ernavreeke.nl (E.M. Vreeke), groot@nictiz.nl (E.M. de Groot), helendegraaf@stichtingvdir.nl (H.I. de Graaf-Waar), coen.van.gool@rivm.nl (C.H. van Gool), n.m.koster@utwente.nl (N. Koster), huib.ten.napel@rivm.nl (H. ten Napel), a.francke@nivel.nl (A.L. Francke), d.delnoij@uvt.nl (D.M.J. Delnoij).

<https://doi.org/10.1016/j.ijmedinf.2017.12.025>

Received 22 September 2017; Received in revised form 2 December 2017; Accepted 27 December 2017

1386-5056/ © 2017 Elsevier B.V. All rights reserved.

1. Introduction

Various classifications are used in nursing practice for recording nursing data in the electronic health records [1,2], which means that problems or nursing diagnoses, interventions and results/outcomes are systematically grouped together, defined and encoded. The advantage is that nurses will be arranging their data in the same way and using the same language when data is recorded. This applies equally in Dutch nursing practice. For instance, 72 home care organisations and 22 software suppliers are members of the Omaha System Support foundation [3], which issues certificates determining whether the basic rules of the Omaha System have been met. There are also organisations and software suppliers that use the classifications for nursing diagnoses (from NANDA International; NANDA-I), interventions (the Nursing Intervention Classification; NIC) and nursing outcomes (Nursing Outcome Classification; NOC) (NNN) and the International Classification of Functioning, Disability and Health (ICF). However, it is not known how many organisations have integrated these classifications into their electronic health records. This reveals that there is a diversity of nursing data [4].

Various reports have been published that discuss the consequences of this variability: information cannot be exchanged and reused properly, for example when a patient is transferred from one care setting to another [5,6]. The nursing transfer report is often still given to the patient in paper form. Even when data is transferred digitally, there is no direct integration into the electronic care file of the receiving care organisation: the data still has to be input manually [4,7,8]. Comparable findings have been observed in international studies into the transfer and reuse of data [9–12].

To help solve these problems, a nursing subset of 119 patient problems has been determined in the Netherlands: its purpose is to develop comparable terms that are used throughout the care sector and can therefore be exchanged [13]. The patient problems have been encoded using the SNOMED CT reference terminology [14]. The focus of this reference terminology is the use of the term and associated synonyms. Links to the classifications can be made, also known as ‘mapping’ [15]. A mapping process checks whether a term from one classification or terminology system matches or is comparable to a term in another classification or terminology system [16]. In this regard, a distinction is made between source terms and target terms. The source terms are the data that has been described and encoded using an encoding system *from which* the map is to be constructed. The target terms are the data of the encoding system *into which* mapping takes place.

The purpose of this investigation is to develop a mapping from the subset of patient problems to three classifications that are used in the Netherlands (the Omaha System, NANDA-I and ICF) to allow automated interchange of data and to increase the comparability of data. The 119 patient problems from the subset were the source terms and the problems or diagnoses of the classifications were the target terms.

Research questions:

To what extent can the SNOMED CT subset of patient problems be mapped onto the:

- Omaha System?
- NANDA International diagnosis tables?
- ICF?

2. Method

2.1. Research design

Descriptive research using a unidirectional strategy based on manual semantic mapping.

A unidirectional strategy means that source terms are only mapped onto target terms [17,18]. Semantic mapping means that the meaning and definition of the terms are considered for similarities of certain

features. If specific features correspond, the terms can be mapped onto one another [19–21]. Vomiting, retching and emesis are for instance associated terms, because their meaning is the same.

2.2. Sample, composition and data collection

2.2.1. Sample

The following source documents and releases were used for the mapping:

- Dutch subset of patient problems [Dutch and English version] (January 2017 release) (<https://www.nictiz.nl/terminologiecentrum/referentielijsten/nationale-kernset>)
- SNOMED International browser (January 2017 release)
- The Omaha System [22] and Het Omaha System; Een introductie [23]
- NANDA International, English version, 2015–2017 edition [24] and Dutch translation of the 2012–2014 edition [25]
- ICF, Dutch translation (2007) [26] and ICF browser 2008–2016 [27]

The mapping was based on both the Dutch and English versions; the Dutch source documents were used for the Dutch mapping. The English versions of the classifications or terminologies were consulted for the associated encoding to make sure that the codes and associated terms corresponded.

2.2.2. Composition

Three separate expert groups were set up for the mapping process; one for each classification system.

The experts involved met with the following requirements:

- a nursing, IT and/or scientific background
- extensive knowledge of at least one specific classification (NANDA-I, Omaha System, ICF, SNOMED CT terminology)
- involvement in the development of a classification or terminology and/or experts in the implementation of a classification or terminology in electronic medical records

2.2.3. Data collection

The mapping method was based on the ISO model 18104, which has been defined by the European Committee for Standardization (CEN). This model breaks patient problems down into (a) a clinical finding, such as pain or (b) a focus (drinking) with a judgement (difficulty) [28]. This detailing made it possible to objectify the similarities and differences between the terms to be mapped. The method was used in various studies and considered to be appropriate [29–31].

In order to structure the mapping process, an Excel file was set up in which three features were determined successively for the subset of patient problems and classifications: Dutch and English terms, the Dutch and English definitions and the associated codes (see Appendix A in Supplementary material).

Each classification has a hierarchy and an encoding system of its own that is decisive for the way that mapping could be done.

The Omaha System defines 42 areas of concern or problems that are mostly described neutrally, each with three possible different attributes: actual, potential or health-promotion. Each area of concern with the attribute ‘actual’ has a set of unique signs/symptoms for that state [22]. Patient problems were mapped by both actual and potential areas of concern. For each area of concern, the table (Appendix A in Supplementary material) states whether it is an actual (A) or potential (P) problem.

The NANDA-I classification comprises 148 concepts that are specified further into 235 standardised nursing diagnoses, grouped into 13 domains and 47 classes (2015–2017 edition). The domains and classes have not been encoded in the documentation used for this study. The nursing diagnoses are encoded and defined [24] and contain

Download English Version:

<https://daneshyari.com/en/article/6926378>

Download Persian Version:

<https://daneshyari.com/article/6926378>

[Daneshyari.com](https://daneshyari.com)