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Zdravstvena informatika - Kategorijske strukture za predstavitev prakse bolniške nege v terminoloških sistemih (ISO/DIS 18104:2022)

Health informatics - Categorical structures for representation of nursing practice in terminological systems (ISO/DIS 18104:2022)

Medizinische Informatik - Kategoriale Strukturen zur Darstellung der Pflegepraxis in terminologischen Systemen (ISO/DIS 18104:2022)

Informatique de santé - Structures catégorielles destinées à la représentation des pratiques de soins infirmiers dans les systèmes terminologiques (ISO/DIS 18104:2022)

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Health informatics — Categorical structures for representation of nursing practice in terminological systems

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 215, Health informatics.

This third edition cancels and replaces the second edition (ISO 18104:2014), which has been technically revised.

The main changes are as follows:

- More comprehensive representation of nursing practice
- Inclusion of nurse sensitive outcomes, its sub-categories representing known confounding variables and their relationship with the care process
- Inclusion of reference to the ISO 13606 and openEHR RIM
- Reference to the inclusion of ICNP into the SNOMED CT terminology
- Representation of the nursing action 'Assessment' as an Observation which is represented as a sub-category of NursingAction
- Recognition of the collaborative roles of nurses and subject of cares informing assessments.
- Inclusion of a goal/ expected outcome category
- Inclusion of a number of defined sub-categories enabling the differentiation between Nursing Actions and actions undertaken by others, as listed in a new category titled Outcome Causation.
- Category definitions were reviewed and updated.
- Definitions are provided for all new categories and sub-categories.

Feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Development of terminological systems (also referred to as terminologies) to support nursing has been motivated by multiple factors including the need to:

- represent nursing concepts in electronic systems and communications, including systems that support multi-professional team communications and personal health records, and
- analyse data about the nursing contribution to subject of care and outcomes — for quality improvement, research, management, reimbursement, policy and other purposes.
- describe nursing in order to educate and inform students and others,

Multiple terminologies exist to support representation of concepts for healthcare purposes; some of these are relevant to the nursing domain. In the context of health informatics, there is a clear requirement for both domain coverage and for interoperability among computer-processable terminological systems that support nursing. Nursing terminologies, or those parts of healthcare-related terminologies that are relevant to nursing, include concept representations for nursing assessments, a nursing action undertaken to determine a nursing diagnoses (judgements). Nursing diagnoses inform the need for nursing actions. Collectively these concepts represent the provision of nursing services whilst nursing sensitive outcomes represent the result of a health, including nursing services delivered at any point in time..

A nursing diagnosis is a label assigned to a judgement based on an assessment finding, event, situation or other health issue to indicate that it is considered to be noteworthy by the nurse and, where possible, the subject of care. A nursing diagnosis is used as an indicator of nursing service demand. Nursing actions are acts performed by or under the direction of a nurse, with the intention of directly or indirectly improving or maintaining the health of a person, group or population, the precise scope of nursing actions being delineated in each jurisdiction. Nursing actions represent nursing service delivery components. These concepts and the scope of nursing practice are further elaborated in [Annex A](#).

A nurse sensitive outcome is a label assigned to the status of a nursing diagnosis at points of time after one or more nursing actions/interventions. A literature review identified that nursing outcome definitions need to differentiate between conceptual, structural or contextual viewpoints^[1]. A conceptual definition recognises that nurse-sensitive subject of care outcomes are the result of a number of defining aspects. Nurse-sensitive health outcomes not only pertain to individuals but also to groups, families, local communities and the population at large. This is further elaborated in [Annex A](#).

Nursing practice is best represented by terminological systems pertaining to three key categories, 1) Nursing Diagnosis, 2) NursingActions and 3) Nurse Sensitive Outcomes. These concepts and the scope of nursing practice reflect the nursing process, they are further elaborated in [Annex A](#). As this standard deals with populations and groups of individuals, as well as individual subjects of care, the definition of 'subject of care' does not comply with ISO 13940:2015.

Many of the categories and subcategories included in this standard are equally applicable to other clinical disciplines. This categorial structure represents a common pattern for all types of clinical practices. The terminologies association with each of these categories and sub-categories are likely to differ to best represent each discipline's knowledge base and service protocols.

Health informatics — Categorical structures for representation of nursing practice in terminological systems

1 Scope

This document specifies the characteristics of three categorical structures, representing nursing practice with the overall aim of supporting interoperability in the exchange of meaningful information between information systems in respect of nursing diagnoses, nursing actions and nurse sensitive outcomes. Categorical structures for nursing diagnoses, nursing actions and nurse sensitive outcomes support interoperability by providing common frameworks with which to:

- a) analyse the features of different terminologies, including those of other healthcare disciplines, and to establish the nature of the relationship between them^{[3]-[8]},
- b) develop terminologies for representing nursing diagnoses, nursing actions^{[9]-[12]}, and nurse sensitive outcomes.
- c) develop terminologies that are able to be related to each other^{[3][8][13]}, and
- d) establish relationships between terminology models, information models and ontologies in the nursing domain^{[14]-[16]}.

There is early evidence that the categorical structures can be used as a framework for analysing nursing practice^[17] and for developing nursing content of electronic record systems^{[18][19]}.

This document is applicable to the following user groups:

- developers of terminologies that include nursing diagnosis, nursing action and nurse sensitive outcome concepts;
- developers of categorical structures and terminologies for other healthcare domains, to support clarification of a relationship to or overlap with nursing concepts;
- developers of models for health information management systems such as electronic health records and decision support systems, to describe the expected content of terminological value domains for particular sub-categories and data elements in the information models;
- developers of information systems that require an explicit system of concepts for internal organization, data repository management or middleware services;
- developers of software for natural language processing, to facilitate harmonization of their output with coding systems.

It is not intended for use by clinical nurses without health informatics expertise. However, [Annex B](#) provides an introduction to categorical structures to assist those without health informatics expertise to contribute to its development, review, implementation and evaluation.

NOTE 1 Although the scope of testing and review of the first edition of this International Standard has been limited to nursing, the three categorical structures have features in common with the more general framework for clinical findings [ISO/TS 22789, the domain-specific categorical structure for surgical procedures (ISO 1828) ^[20], *ISO EN 13940: 2015* as well as with the WHO ICHI^[2]. The standard may therefore inform development of other general and domain-specific categorical structures in healthcare.

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Topics considered outside the scope of this document include:

- complete categorial structures that would cover all the potential details that could appear in expressions of nursing diagnoses, nursing actions and nurse sensitive outcomes,
- a detailed terminology of nursing diagnoses or nursing actions or nurse sensitive outcomes,
- a “state model” for nursing diagnoses or nursing actions or nurse sensitive outcomes — for example, provisional nursing diagnosis or absent nursing diagnosis, planned nursing action or nursing action not to be done — see [Annex A](#),
- nursing diagnoses made and nursing actions undertaken by nurses working in other professional roles — see [Annex A](#) — and
- knowledge relationships such as causal relationships between concepts — see [Annex B](#).

NOTE 2 Throughout the main body of this International Standard, where terms such as nursing diagnosis, nursing action and nurse sensitive outcome are used, these refer to representation of these concepts in electronic systems, not to the professional activity of making a diagnosis or performing an action or determining their relationship with nurse sensitive outcomes. [Figure 1](#) is a mindmap representing the many categories that comprise nursing practice.

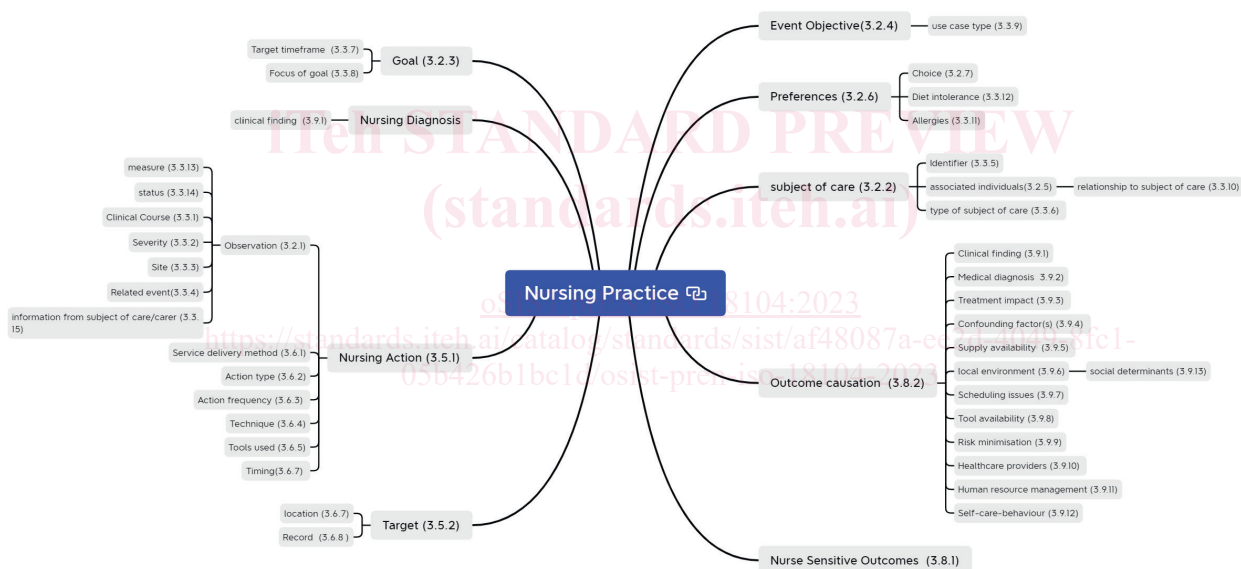


Figure 1 — Mindmap representing categories that collectively represent the Nursing Practice domain

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

ISO 17115:2020, *Health informatics — Representation of categorial structures of terminology (CatStructure)*

ISO/TS 22789:2010, *Health informatics — Conceptual framework for patient findings and problems in terminologies*

CSN EN 12264:2005, *Health informatics — Categorial structures for systems of concepts*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 General

3.1.1

concept

subset of knowledge constructed through combining *characteristics* (3.1.4)

[SOURCE: ISO 1087:2019, 3.2.7 modified - *unit* replaced by *subset*, *created by* replaced by *constructed through*, *combination* replaced by *combining*.]

Note 1 to entry: A concept can have one or more names. It can be represented using one or more terms, pictures, icons or sounds.

3.1.2

categorial structure

minimal set of *domain constraints* (3.1.5) for representing concept systems in a precise domain to achieve a precise goal.

[SOURCE: EN 12264:2005]

Note 1 to entry: [Annex B](#) provides further explanation.

3.1.3

category

division of sets of *entities* (3.1.6) regarded as having particular shared *characteristics* (3.1.4)

Note 1 to entry: Categories may be more or less general and include groups of individual subject of cares or carers. Where one category is subsumed by another, the isA relation is asserted to obtain a hierarchy between the more specific or subsumed category (sub-category) and the more general or subsuming category.

EXAMPLE 1) parenteral route is more general than intravenous route., 2) target isA site which has attributes.

Note 2 to entry: Each *entity* (3.1.6) instantiates some category.

3.1.4

characteristic

abstraction of a property

[SOURCE: ISO 1087:2019, 3.2.1, modified, example added and note modified]

EXAMPLE Fever is a *characteristic* symptom of flu.

Note 1 to entry: Characteristics are used for describing *concepts* (3.1.1) and for differentiating *categories* (3.1.3).

3.1.5

domain constraint

rule prescribing the set of *sanctioned characteristics* (3.1.8) that are valid to specialize a concept representation in a subject field

EXAMPLE *Administration of drug* possibly hasRoute *subcutaneous* describes the fact that drugs can be administered subcutaneously in the specific context that the terminology applies to.

Note 1 to entry: Different levels of sanctioning are possible, e.g. conceivable, sensible, usuallyInTheContextOf, normal, necessary.

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3.1.6

entity

concept represented as a diagrammatic grouping of a concrete or abstract thing of interest

EXAMPLE As shown in a relational database entity-relationship diagram

Note 1 to entry: This definition is similar to that for *object* in ISO 1087-1: anything perceivable or conceivable. ISO 1087-1 notes that objects may be material (e.g. an engine, a sheet of paper, a diamond), immaterial (e.g. conversion ratio, a project plan) or imagined (e.g. a unicorn). However, the term *object* is normally interpreted as representing a material thing, therefore *entity* is preferred.

3.1.7

representation relation

semantic link

formal representation of a directed associative relation or partitive relation between two *concepts* (3.1.1)

EXAMPLE hasFocus; actsOn.

Note 1 to entry: A *representation relation* (3.1.7) always has an inverse, i.e. another representation relation with the opposite direction. The inverse may or may not be explicitly stated. For example, isFocusOf (inverse of hasFocus); isTargetOf (inverse of actsOn).

3.1.8

sanctioned characteristic

formal representation of a type of *characteristic* (3.1.4)

EXAMPLE hasFocus symptom; hasSite altered structure.

3.1.9

terminological system

terminology

structured human and machine-readable representation of clinical *concepts* (3.1.1) required directly or indirectly to describe health conditions and healthcare activities, and allow their subsequent retrieval or analysis

Note 1 to entry: It also refers to the relationship of the terminology to the specifications for organizing, communicating and interpreting such a set of concepts.

3.1.10

attribute

piece of information which determines the properties of a field or tag in a database.

Note 1 to entry: Attributes may be represented by a terminology

3.1.11

qualifier

limits or modifies the meaning of the category to which this belongs

3.1.12

clinical information model

CIM

information model that expresses in a standardized and reusable manner one or more healthcare or clinical concepts and their context in a conceptual and logical model, specifying healthcare information as a discrete set of data elements, their characteristics and relationships, and appropriate terminology bindings

[SOURCE: ISO 13972:2022, 3.1.13]

3.1.13

focus

area of attention

3.2 Categories of healthcare entities for nursing diagnoses

3.2.1

observation

assessment of the status of a *subject of care* (3.2.2) – is a sub-category of *NursingAction* (3.5.1)

Note 1 to entry: Assessment includes one or a combination of a measurement, evaluation or judgment that relates to a variable pertaining to the status of a *subject of care* (3.2.2).

Note 2 to entry: Observation *sub-category* (3.1.10) that are valid for representation of a type of assessment or activity, including a nursing diagnosis, include, but are not limited to, measures, status, site, information from and about subject of care and from other care providers.

[SOURCE: SKMT / CDISC]

3.2.2

subject of care

type of *entity* (3.1.6) to which the nursing diagnosis refers, including a natural person or a sized group of persons who have been the recipients of the delivery of one or more nursing services or were directly associated with a person or persons of significance to the subject of care.

Note 1 to entry: Subject of care *categories* (3.1.3) valid for representation of a type of assessment or activity, including nursing diagnosis, are subjected to associated individuals, e.g. personal carer, subject of care preferences and event objectives.

Note 2 to entry: This definition is divergent from the definition in ISO 13940:2015 as this standard deals with populations and groups of subjects of care as individuals.

3.2.3

goal

defined outcome or condition to be achieved in the process of subject of care care

[SOURCE: IHE /SKMT]

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Note 1 to entry: Its sub-categories are *focus* (3.1.13) and target timeframe.

3.2.4

event objective

purpose of use, defining aspect: *Attribute* (3.1.10) of data that differentiates this data from other data required for a different user or use case

[SOURCE: (ISO, CEN SKMT)]

Note 1 to entry: Its sub-category is the *use case type*. (3.3.9)

3.2.5

associated individuals

person of significance to the subject of care

Note 1 to entry: its attribute is the relationship to the subject of care.

3.2.6

preferences

greater liking for, or essential or chosen, treatment or care requirement, for one alternative over another.

Note 1 to entry: Its sub-categories include 'choice' of caring or service delivery options, diet intolerances and allergies. These sub-categories differentiate between concepts subject ed to decisions to be made.

3.2.7

choice

subject of care's preferred treatment or care option