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EQUIVALENCE BETWEEN ICNP® AND SNOMED CT CONCEPTS: THEORETICAL REFLECTION

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ABSTRACT

Objective: to reflect on the equivalence between the concepts of the International Classification for Nursing Practice and the Systematized Nomenclature of Medicine International – Clinical Terms.
Method: theoretical reflection based on the analysis of equivalence between the concepts of diagnoses, results and nursing interventions of the International Classification for Nursing Practice and the hierarchy of the Systematized Nomenclature of Medicine International – Clinical Terms. The researchers' experience and articles on the subject provided support for analysis.
Results: nursing diagnoses and results of the International Classification for Nursing Practice are present in the hierarchies "clinical finding", "disorder" and "problem situation", while the interventions are included in the hierarchies "procedure" and "regime/therapy". The main causes of non-equivalence are linked to the problems of the specificity of the concept. Cross-mapping will require analysis by nursing specialists to improve the representativeness of the concepts. The equivalence table must be translated into Brazilian Portuguese, but the entire Systematized Nomenclature of Medicine International – Clinical Terms lacks interdisciplinary work.
Conclusion: the representation of the International Classification for Nursing Practice in systematized Nomenclature of Medicine International - Clinical Terms will bring benefits related to the clarity of concepts. The concepts of nursing classification that are not equivalent will require conceptual analysis. The lack of translation of the Systematized Nomenclature of Medicine International – Clinical Terms for the Portuguese language will reflect the development of terminological subsets of the International Classification for Nursing Practice.

DESCRITORS: Standardized terminology in nursing. International Nursing Council. Classification. Nursing diagnosis. Controlled vocabulary.

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EQUIVALÊNCIA ENTRE CONCEITOS DA CIPE® E DA SNOMED CT: REFLEXÃO TEÓRICA

RESUMO

Objetivo: refletir sobre a equivalência entre os conceitos da Classificação Internacional para a Prática de Enfermagem e da *Systematized Nomenclature of Medicine International –Clinical Terms*.
Método: reflexão teórica baseada na análise da equivalência entre os conceitos de diagnósticos, resultados e intervenções de enfermagem da Classificação Internacional para a Prática de Enfermagem e a hierarquia da *Systematized Nomenclature of Medicine International – Clinical Terms*. A experiência das pesquisadoras e artigos sobre o tema ofereceram suporte para análise.
Resultados: diagnósticos e resultados de enfermagem da Classificação Internacional para a Prática de Enfermagem estão presentes nas hierarquias "achado clínico", "transtorno" e "situação-problema", enquanto as intervenções constam nas hierarquias "procedimento" e "regime/terapia". As principais causas de não equivalência são ligadas aos problemas da especificidade do conceito. O mapeamento cruzado exigirá análise por especialistas na enfermagem para melhorar a representatividade dos conceitos. A tabela de equivalência deverá ser traduzida para o português brasileiro, porém a totalidade da *Systematized Nomenclature of Medicine International – Clinical Terms* carece de trabalho interdisciplinar.
Conclusão: a representação da Classificação Internacional para a Prática de Enfermagem na *Systematized Nomenclature of Medicine International - Clinical Terms* trará benefícios relacionados à clareza dos conceitos. Os conceitos da classificação de enfermagem que não foram equivalentes necessitarão de análise conceitual. A ausência de tradução da *Systematized Nomenclature of Medicine International – Clinical Terms* para o português refletirá no desenvolvimento de subconjuntos terminológicos da Classificação Internacional para a Prática de Enfermagem.

DESCRITORES: Terminologia padronizada em enfermagem. Conselho Internacional de Enfermagem. Classificação. Diagnóstico de enfermagem. Vocabulário controlado.

EQUIVALENCIA ENTRE CONCEPTOS ICNP® Y SNOMED CT: REFLEXIÓN TEÓRICA

RESUMEN

Objetivo: reflexionar sobre la equivalencia entre los conceptos de la Clasificación Internacional para la Práctica de Enfermería y la Nomenclatura Sistematizada de Medicina Internacional – Términos Clínicos.
Método: reflexión teórica basada en el análisis de la equivalencia entre los conceptos de diagnósticos, resultados e intervenciones de enfermería de la Clasificación Internacional para la Práctica de Enfermería y la jerarquía de la Nomenclatura Sistematizada de Medicina Internacional – Términos Clínicos. La experiencia de los investigadores y los artículos sobre el tema sirvieron de apoyo para el análisis.
Resultados: los diagnósticos y resultados de enfermería de la Clasificación Internacional para la Práctica de Enfermería están presentes en las jerarquías "hallazgo clínico", "trastorno" y "situación-problema", mientras que las intervenciones están incluidas en las jerarquías "procedimiento" y "régimen/terapia". Las principales causas de la no equivalencia están vinculadas a los problemas de especificidad del concepto. El mapeo cruzado requerirá el análisis de expertos en enfermería para mejorar la representatividad de los conceptos. La tabla de equivalencia debe ser traducida al portugués brasileño, pero la totalidad de la Nomenclatura Sistematizada de Medicina Internacional – Términos Clínicos carece de trabajo interdisciplinario.
Conclusión: la representación de la Clasificación Internacional para la Práctica de Enfermería en la Nomenclatura Sistematizada de Medicina Internacional – Términos Clínicos traerá beneficios relacionados con la claridad de conceptos. Los conceptos de clasificación de enfermería que no sean equivalentes requerirán un análisis conceptual. La falta de traducción de la Nomenclatura Sistematizada de Medicina Internacional – Términos Clínicos para el portugués se reflejará en el desarrollo de subconjuntos terminológicos de la Clasificación Internacional para la Práctica de Enfermería.

DESCRIPTORES: Terminología estandarizada en enfermería. Consejo Internacional de Enfermería. Clasificación. Diagnóstico de enfermería. Vocabulario controlado.

INTRODUCTION

In 2020, the International Council of Nurses (ICN) announced a partnership with the Systematized Nomenclature of Medicine International (SNOMED International) to integrate the International Classification for Nursing Practice (ICNP®) into SNOMED – Clinical Terms (SNOMED CT). This partnership provides that ICN will continue to maintain ownership and control of ICNP content®, while SNOMED International – an organization composed of a committee of experts, owner and developer of SNOMED CT content – is responsible for managing, producing and disseminating the classification on behalf of ICN.

SNOMED CT is a clinically validated multilingual controlled vocabulary that can be used to standardize electronic health records and allow semantic interoperability between systems and the reuse of clinical information. Created in 1965, with the construction of nomenclature based on semantic logic, in the area of pathology, but it was only in 2002 that its structure was organized in its current way. It is a worldwide terminology, used in more than 50 countries, covering multiple specialties and health domains, whose 2020 version includes more than 350,000 concepts.

SNOMED CT is used to support clinical decisions and identifies its application, for example, in institutions that make up the National Health Service Hospitals in the United Kingdom and the Italian Hospital in Buenos Aires, Argentina.

In October 2021, SNOMED International announced the launch of the set called ICNP SNOMED CT Nursing Practice Refset[1], which is accompanied by an equivalence table between the concepts of diagnoses, results and nursing interventions of the ICNP® and SNOMED CT. The table can be accessed on the ICN website, upon registration, with a record of justification for use[2].

The partnership between the institutions was supported by the fact that SNOMED CT[3] has a vast set of concepts clinically validated and semantically rich, as well as by the statement that nursing is not an isolated practice, but an interdisciplinary practice. Thus, the ICN argued that there would be greater worldwide expressiveness of the concepts that represent nursing practice, which, in turn, would benefit from the inclusion of a specific classification of its domain in another, with amplitude for the health area.

This new form of dissemination and organization of the concepts of the ICNP® raised doubts about the negotiations related to countries that are not members of SNOMED International – such as Brazil, in addition to the technical-operational developments related to the research and development of the ICNP®. While the ICN was the manager of the ICNP®, its use for research and development purposes did not involve costs; a small fee was charged if the use was commercial. Likewise, SNOMED International allows SNOMED CT to be used free of charge for academic and non-commercial purposes, with access through browsers provided by collaborating centers and development partners[4]. For commercial or other use, it is necessary to apply and pay for a personal or institutional license.

In Brazil, Ordinance No.2,073, of August 31, 2011[5], of the Ministry of Health, determined that SNOMED CT would be used for semantic interoperability between terminologies in the country, a fact that has not been operationalized over the years. This ordinance was repealed by Ordinance No.1,434 of May 28, 2020[6], in which it is established that interoperability standards will be evaluated by technical staff, which will analyze, among other issues, the costs and efforts for adoption, as well as the advantage of one standard in relation to the others.

For the Brazilian Health Ministry, the standard considered advantageous is the one that: is open or free of charge or, if there is a cost, is the lowest; has less complexity; has greater adoption by the Brazilian health sector (on a non-experimental or academic basis) or by other countries, especially by Brazil's partners or with which the country cooperates; and is in a stable version[6]. Thus, it is not

known whether SNOMED CT will be the nationally chosen standard, even if the system is used by 41 member countries (three in Latin America: Argentina, Chile and Uruguay) and releases more than 5,000 individual or organizational licenses worldwide, including some licenses in Brazil.

From the point of view of research and development, SNOMED CT is little known and studied by the nursing area, especially In Brazil[7]. Brazilian researchers are producers of knowledge about the ICNP®, with a leading role in research developed in graduate programs, especially linked to the Center for Research and Development of the ICNP®, based at the Federal University of Paraíba (UFPB)[8–9]. In addition to the significant contribution to scientific production, the Brazilian center, through executive members and collaborators, has been responsible for translating the ICNP® into the Brazilian Portuguese since the 2011 version.

In the context that nursing has little approximation with SNOMED CT[7,10] and that the classification has no translation to the Portuguese language, it is considered necessary to know the elements of equivalence between the ICNP® and SNOMED CT, in order to minimize a possible discontinuity of Brazilian collaboration to the first. Therefore, this article aims to reflect on the equivalence between the concepts of ICNP® and SNOMED CT.

The researchers' experience on the subject and related articles supported the development of the reflection. At first, the researchers dedicated themselves to organizing the general lines of the content of the reflection, focusing on the items presented in the equivalence table provided by the ICN[2]. For a better understanding of the equivalence, examples of the relationship between the representations of a nursing diagnosis concept and a nursing intervention concept in the two classifications were established. Subsequently, aspects that limited the non-equivalence of terms and, in a complementary way, the translation issue and the development of subsets were discussed.

EQUIVALENCE BETWEEN THE ICNP® AND SNOMED CT

SNOMED CT is a clinical terminology with unique meanings and concepts. Like the ICNP®, its hierarchy is based on ontology logic, which organizes the classification, essentially, by classes, attributes and relationships.

The content of SNOMED CT is represented by a set of interrelated components, including concepts, hierarchies, attributes, identifiers, descriptions, and relationships[11]. Concepts are organized into 19 hierarchies, and descriptions link attributes and their relationships to a numeric identifier.

Briefly, the structure of SNOMED CT is organized by a logical model and a conceptual model[3]. The first provides the fundamental structure of terminology, making it possible to identify how each component is represented, while the second presents the rules so that it is computationally readable.

The 19 superior concepts (more general of the hierarchy) are: body structure; clinical finding; environment or geographical location; event; model component of SNOMED CT (metadata); observable entity; organism; pharmaceutical/biological product; physical strength; physical object; procedure; qualifying value; registration element; situation with explicit context; social context; special concept; specimen; staging and scale; substance[3]. The lower concepts are represented by a type relationship/ is one/ and a relationship with one or more attributes, and a concept must have at least one type relationship/is one/ and all attributes that are necessary to clarify it.

The logical model allows a concept to be identified by the preferred name (which is marked "preferred") and by its synonyms (which are marked as "acceptable")[3]. This functionality enables different countries or scenarios to use the same encoding for culturally acceptable terms. In turn, the conceptual model represents the characteristics of the concepts and provides, among other functionalities, that proponents of new terms apply the proposed rules to test the definition and, consequently, validate the concept.

Until version 2019/2020, the ICNP® was represented by a 7-Axis model, with atomic concepts, namely: focus, judgment, means, action, time, location and client, and by the pre-combined concepts of nursing diagnoses, outcomes and interventions. In its migration, the representation of atomic concepts in the 7-Axis model disappears, using the models proposed by SNOMED-CT.

The total of 2,035 concepts of diagnoses, results and nursing interventions of the ICNP® version 2019/202012 was mapped with the concepts of SNOMED CT. The equivalency table provided by the ICN presents 1,938 concepts (95.2% of the total) identified in SNOMED CT, being: 892 procedures, 719 clinical findings, 181 regimens/therapies, 98 problem situations and 48 disorders.

For SNOMED CT, a clinical finding is the result of an observation, evaluation or clinical judgment[11] including normal and abnormal clinical states. Thus, it was expected that the nursing diagnoses and results of the ICNP were® widely found in this set of hierarchy. Disorders also represent nursing diagnoses/outcomes, as well as problem situations.

Chart 1 exemplifies how a concept of nursing diagnosis is represented in SNOMED CT and compares it with the representation of the ICNP®. The diagnosis “Activity intolerance”, in SNOMED CT, is a clinical finding that is linked to another clinical finding (parent term) and relates to two attributes: (i) ability to perform a function/activity; (ii) change. Thus, this nursing diagnosis can be defined, in the ontological hierarchy, as a type of activity change, specifically, a change in the ability to perform a function/activity.

In the ontological hierarchy of the ICNP®, the concept “Activity Intolerance” is, at the same time, a focus and a nursing diagnosis and is linked to another focus (parent term). In the ICNP®, the diagnostic concept benefits from the description of the focus, that is, “Activity Intolerance” is defined as “lack of capacity or energy to resist or complete activities”[12:156].

In the exemplified case (Chart 1), the concepts were considered equivalent by the term (exactly the same in both classifications) and by the meaning of their relationships, determined by the hierarchy. For semantic equivalence, the terms “impairment”, “alteration” and “lack” were considered potentially similar.

In turn, the nursing interventions of the ICNP® were represented by concepts of procedure and regime/therapy of SNOMED CT. The procedures represent the set of activities that are performed during a service, from simple to most complex; including regimens/therapies.

Chart 2 shows how a nursing intervention is represented in SNOMED CT and compares it with the ICNP representation®. The intervention “Antibiotic administration” is a procedure that is linked to another procedure (parent term) and relates to two attributes: (i) method and action of administration and (ii) administered substance. Thus, this intervention can be defined, in the ontological hierarchy, as a type of administration of medicine or drug, specifically the administration of a substance with an antibacterial mechanism.

In the ontological hierarchy of the ICNP®, the intervention “Administer antibiotic” is an action linked to another action (parent term). Thus, it benefits from the concept of the term parent, that is, “Administering Antibiotic” is defined as: “providing or administering something”[12:197].

In this case, the equivalence between the concepts was given by verbal time (administer - administration) and the concept began to have a more detailed definition, because it benefited from the more specific attribute of SNOMED CT.

A total of 97 concepts of diagnoses, results and nursing interventions of the ICNP® were not identified in SNOMED CT and, consequently, were not equivalent. Some of the non-existent concepts in SNOMED CT were considered for inclusion in the future version of the classification, as they contained details in their definitions. For others, the incorporation by SNOMED CT will be gradual or even impossible.

Chart 1 – Relationship between the representation of the nursing diagnostic concept "Activity intolerance" in SNOMED CT and ICNP®. 2021.

	SNOMED CT	ICNP®
Component / Axis	Clinical finding	Focus Nursing diagnosis
Linked to (parent term)	Activity disorder (clinical finding)	Condition, Impaired (focus)
Related to	Ability to perform a function/activity (observable entity)	
Related to	Change (value qualifier)	
Defined as	Activity change: Change in ability to perform a function/activity	Lack of capacity or energy to resist or complete activities

Legend: SNOMED CT: *Systematized Nomenclature of Medicine International Clinical Terms*; ICNP®: International Classification for Nursing Practice.
Source: International Health Terminology Standards Development[4]; International Council of Nurses[12].

Chart 2 – Relationship between the representation of the nursing intervention concept "Antibiotic Administration" in SNOMED CT and ICNP®. 2021.

	SNOMED CT	ICNP®
Component / Axis	Procedure	Action
Linked to (parent term)	Administration of drugs or medicine (procedure)	Administer (action)
Related to	Method Attribute Administration action (value qualifier)	
Related to	Substance with antibacterial mechanism action (substance)	
Defined as	Administration of drug or medicine: administration of a substance with antibacterial mechanism	Provide or manage something

Legend: SNOMED CT: *Systematized Nomenclature of Medicine International Clinical Terms*; ICNP®: International Classification for Nursing Practice.
Source: International Health Terminology Standards Development[4]; International Council of Nurses[12].

A significant limitation of the ICNP® was identified in the non-equivalent concepts, i.e.: the presence of vague, obscure or broad/comprehensive terms. Therefore, for future inclusion of nursing concepts in SNOMED CT, a process of conceptual analysis or evaluation by specialists for the term to be detailed will be necessary.

Conceptual analyses of nursing diagnoses are operationalized by the nursing area, especially by research involving NANDA International. However, the area does not practice the conceptual analysis of nursing interventions. Thus, it is relevant to establish cooperative efforts to direct conceptual analysis research of the terms that are part of an intervention, so that it is considered suitable for inclusion in the ontological SNOMED CT hierarchy.

The analyses of traditional concepts used by nursing are powerful for mature concepts, which have objective attributes and easily identified in literature or clinical practice[13]. However, one must think of the problem related to immature concepts, whose meaning is generic, easily confounded with broader concepts, and which require more powerful methods for their analysis. Examples of immature, nonspecific or vague concept can be identified in the list of non-equivalent ICNP diagnoses® in SNOMED CT, among them: Crime (100053680 code), Impression Aphasia (10047025 code) and Lack of Knowledge (10000837 code).

As nursing practice is focused on objective and subjective phenomena, the representation of some concepts of ICNP can® be included in the SMONED CT, given the fact that one of the main rules for the inclusion of concepts in this classification is the specificity and clarity of its meaning. In other words, if nursing does not define concepts of its domain with the clarity and specificity expected for the conceptual model of SNOMED CT, the representation of the phenomena of its practice in broader contexts or other professional domains will be a consequence, which will result in the impossibility of identifying the specific terminology of the profession in the whole of SNOMED CT.

Other examples of concepts in which equivalence has not been established are nursing outcomes related to the absence of complications of the parturition, childbirth and postpartum process (10042433, 10042422 and 0042467). Although they have been present in the ICNP® since 2009, they lack explicit meaning, as they are hierarchically linked to the focus Complication (code 10025459), which has no definition. It is known that nursing professionals show factors that do not bring benefits to women in the parturition process[14], therefore, the identification of nursing results in this context may serve as a basis for the analysis of unappropriated practices.

Another possibility to increase the ability to explain the definition is the use of archetypes to describe nursing diagnoses and interventions, whose reproducible model was published by Brazilian and Portuguese researchers[15]. The use of archetypes allows the elements of nursing practice to be represented by structured and computable clinical information, with decision-making rules that enhance the clinical reasoning of nurses[15], which, in fact, also helps in the equivalency process.

Equivalences between classification systems are performed by manual or automated cross-mapping. Thus, it is inevitable that nursing approaches this resource to improve its ability to explain the meaning of the concepts of its domain. Research indicates that manual or automated methods should be used in a complementary way to capture exact equivalences or candidate terms[16–17].

Another important fact for reflection is the need for cooperation between institutions and experts to determine how mapping should be interpreted and used. This situation was presented by researchers from the Netherlands, who described a mapping strategy between a set of patient information using SNOMED CT and the following classifications: Omaha System, NANDA International and International Classification of Functionality, Disability and Health. They concluded that there is loss of information in most cases, due to the structure and degree of detail of the three comparative classifications[18].

In the same country, another study, which analyzed a subset of 119 nursing concepts of SNOMED CT used in the country, concluded that 95% had correspondence with the ICNP®, indicating it as a terminology capable of representing nursing practice in the country[18]. This result reaffirms the potential that the ICNP® has to respond to the objective of being a broad and representative classification of nursing practices in different countries. However, the Dutch researchers state that research should be done to improve the amplitude of representation of ICNP concepts® in SNOMED CT, as they identified some that could be equivalent and that were not listed in the table disclosed, as well as others that were inadequately described for nursing practice in SNOMED CT[19]. Therefore, the importance of the consistent cross-mapping process, as well as the hard work of conceptual analysis by specialist nurses, is verified.

Finally, it is worth presenting two more reflections correlated with equivalency: the translation of the ICNP® into the Portuguese language and the construction of terminological subsets. Although the equivalency table is easily translated because it benefits from previous versions of the ICNP®, the same premise does not apply to the entire SNOMED CT, as it does not constitute a task of an exclusive professional domain. Brazil could benefit from a translation into European Portuguese, but Portugal, even though it is a member country of SNOMED International, also did not translate it.

As the construction of subsets of the ICNP®, from the partnership signed, will be the result of the use of terms included in the hierarchy of SNOMED CT, Brazilian nurses, researchers and assistants who are dedicated to the development of subsets must mandatorily work with the English version and perform free translations and back-translation as a methodological stage.

CONCLUSION

The representation of the diagnoses, results and interventions of the ICNP® in SNOMED CT will bring indisputable benefits related to the clarity of the definitions of the concepts, due to the detailing of the ontological organization, which has attributes and a relationship with greater detail.

Part of the diagnoses, results and interventions of the ICNP® that did not have equivalence lacks conceptual analysis so that their definitions are not vague, obscure or broad/comprehensive. The nursing area will also contribute to the inclusion of new terms in the SNOMED CT, in addition to adding meanings of concepts for the proper application to nursing practice.

The lack of SNOMED CT in the Portuguese language and the non-participation of Brazil as a member country of SNOMED International may have an impact on the Brazilian participation in the development of the ICNP®. The scenario will require interdisciplinary and interinstitutional cooperation between nurse researchers and care workers who work with the ICNP and® other terminologies in the nursing area.

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NOTES

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Discussion of the results: Cubas MR, Nóbrega MML.
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