

Cross-mapping the ICNP with NANDA, HHCC, Omaha System and NIC for unified nursing language system development

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Abstract

Nursing language plays an important role in describing and defining nursing phenomena and nursing actions. There are numerous vocabularies describing nursing diagnoses, interventions and outcomes in nursing. However, the lack of a standardized unified nursing language is considered a problem for further development of the discipline of nursing. In an effort to unify the nursing languages, the International Council of Nurses (ICN) has proposed the International Classification for Nursing Practice (ICNP) as a unified nursing language system. The purpose of this study was to evaluate the inclusiveness and expressiveness of the ICNP terms by cross-mapping them with the existing nursing terminologies, specifically the North American Nursing Diagnosis Association (NANDA) taxonomy I, the Omaha System, the Home Health Care Classification (HHCC) and the Nursing Interventions Classification (NIC). Nine hundred and seventy-four terms from these four classifications were cross-mapped with the ICNP terms. This was performed in accordance with the Guidelines for Composing a Nursing Diagnosis and Guidelines for Composing a Nursing Intervention, which were suggested by the ICNP development team. An expert group verified the results. The ICNP Phenomena Classification described 87.5% of the NANDA diagnoses, 89.7% of the HHCC diagnoses and 72.7% of the Omaha System problem classification scheme. The ICNP Action Classification described 79.4% of the NIC interventions, 80.6% of the HHCC interventions and 71.4% of the Omaha System intervention scheme. The results of this study suggest that the ICNP has a sound starting structure for a unified nursing language system and can be used to describe most of the existing terminologies. Recommendations for the addition of terms to the ICNP are provided.

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Introduction

Since the time of Florence Nightingale, nursing has continued to develop by virtue of nurses in practice, administration, education and research. However, nursing is still poorly understood and consequently it is undervalued. Why does nursing still have this problem? We know that 'quality nursing practice makes a difference'. Exactly what difference does nursing make and how can we describe this contribution? Why do we have such difficulty in describing the difference between a professional nurse and a healthcare assistant? One answer to all these questions is that there is no common language to describe what nurses do, what sort of problems or patient conditions they may encounter and with what results. Without a language to express nursing concepts we cannot know whether our understanding of their meaning is the same, so we cannot communicate about nursing practice with any precision to other people (Clark 1999).

Lack of standardized, uniform vocabularies to describe nursing is considered a major problem to further development of the discipline of nursing (Moen et al. 1999). Although the need for a standard nursing nomenclature has been expressed repeatedly over the years, no single nomenclature that describes all of nursing practice in all settings is available (Averill et al. 1998).

The formal initiative to standardize classification systems and taxonomies for nursing practice started in the USA in the 1970s. In the 1990s, the American Nurses Association (ANA) recognized the North American Nursing Diagnosis Association Taxonomy I (Kim et al. 1993), the Omaha System (Martin & Scheet 1992), the Home Health Care Classification (HHCC) (Saba 1992), the Nursing Interventions Classification (NIC) (McCloskey & Bulechek 1996), the Nursing Outcomes Classification (NOC) (Johnson & Maas 1997) and the Patient Care Data Set (Ozbolt et al. 1994) as nursing classification systems (Moen et al. 1999). However, none of these existing languages was sufficient or could capture all of 'what nurses do, for what conditions, with what results' (International Council of Nurses 1993; Clark 1999). Furthermore, as we use a different classification for expressing the same meaning,

we are required to devote much time and effort to sharing and communicating nursing information.

In 1989, the International Council of Nurses (ICN) began a project to develop an International Classification for Nursing Practice (ICNP). The ICNP is a combinatorial terminology for nursing practice that facilitates cross-mapping of local terms and existing vocabularies and classifications. The ICN described the ICNP as a 'unifying framework' (ICN 1996). The beta version of the ICNP is a multiaxial and polyhierarchical classification of nursing phenomena and nursing actions, which facilitates expression of nursing diagnoses, nursing interventions and nursing outcomes (ICN 2000).

Currently, an initiative to develop a nursing reference terminology model is being carried out by CEN/TC 251 WG 2 and ISO/TC 215 WG 3. The CEN model brought together the efforts of the ICNP Programme, Telenurse ID and other European efforts, such as the Galen Projects, into a Prestandard (European Committee on Standardization 2000). In contrast to the CEN Prestandard that addressed categorical structure for nursing diagnoses and nursing actions, the International Standards Organization (ISO) model focuses on the conceptual structures that are represented in a reference terminology model (International Standards Organization 2001). The ISO model also reflects attempts to integrate with other health care models outside the domain of nursing. The ISO model consists of a reference terminology model for nursing diagnoses and a reference terminology model for nursing actions. The reference terminology model for nursing diagnoses has four descriptors, namely: focus; judgement; site; and subject of information. The reference terminology model for nursing action has six descriptors, namely: action; target; site; route; means; and subject of care. The notion of a mapped system of nomenclature is not new. A Unified Nursing Language System (UNLS) does not replace but contains existing classifications. A UNLS provides mapping capability from one classification to another. Consequently, we need to take a closer look at the ICNP as a UNLS.

The purpose of this study was to investigate the expressiveness and the inclusiveness of the ICNP by cross-mapping it to several existing nursing classifi-

cation systems: the NANDA Taxonomy I; the HHCC; the Omaha System; and the NIC.

Method

Subject

In this study, we chose four nursing classification systems: the NANDA Taxonomy I; the Omaha System; the HHCC; and the NIC. The total number of nursing diagnoses was 318 and of nursing interventions was 656 from all four classification systems:

- 128 diagnoses of the NANDA Taxonomy I (NANDA 1996),
- 44 problems and 63 intervention targets of the Omaha System (Martin & Scheet 1992),
- 146 diagnoses and 160 interventions of the HHCC (Saba 1992), and
- 433 interventions of the NIC (McCloskey & Bulechek 1996).

These four classification systems are recognized as meeting the criteria for recognition by the ANA and are also included in Metathesaurus of the Unified Medical Language System of the US National Library of Medicine (NLM).

Cross-mapping

Cross-mapping was conducted by the authors. Diagnoses of the NANDA, the HHCC and the Omaha System were cross-mapped to the ICNP Nursing Phenomena classification, based on the Guidelines for Composing a Nursing Diagnosis proposed by the ICN (2000). Interventions of the NIC, the HHCC and the Omaha System were cross-mapped to the ICNP nursing action classification based on the Guidelines for Composing a Nursing Intervention (ICN 2000).

According to the guidelines, only one term from each of the ICNP axes can be used for a single diagnosis. As in certain cases a diagnosis could imply plural meanings, it was mapped to the ICNP by its definition. Therefore, the cross-mapping was carried out based on the meaning of the concepts, using their definitions. For instance, violence risk of the HHCC and risk for violence: self-directed or directed at others, of NANDA, could not be mapped

to the ICNP because the definition of violence: directed at others of the ICNP focus axis includes not only violence to others but also violence to oneself. Human sexuality of the Omaha System could not be mapped to the ICNP as the definition of sexual function of ICNP focus axis did not correspond. Nursing interventions must include a term from action-type axis. When we could not find a specific term in the ICNP, we chose a term that had broader meaning. However, this solution would not necessarily constitute a complete mapping. For example, anticipatory grieving of NANDA and HHCC could be mapped to grief of the ICNP focus axis and yes of judgement axis, although this was counted as 'Partially mapped'.

Verifying the cross-mappings

To increase the reliability of the cross-mapping, we repeated the procedure eight times for 6 months. Coincidentally, the ICNP team revised the ICNP Emerging Beta Version during that period by adding and deleting terms. Therefore, we conducted additional recross-mapping three times. An expert group verified the results of the cross-mapping using a consensus process.

The expert group consisted of eight individuals who were all members of the nursing language standardization team. Their backgrounds were: adult health nursing specialist; maternity nursing specialists; QA specialist; and nursing informatics specialists.

The cross-mappings were finally reviewed by an expert in the ICNP. Discussions of inconsistencies in cross-mappings were held to find agreement across experts and resulted in minor modifications to the preliminary findings. Finally, in the few mappings where no agreement was reached, the author used the guidelines for mapping and made a final determination.

Results

Cross-mapping

The total number of nursing diagnoses examined for cross-mapping in this study were 318: 128

Table 1 Results of nursing diagnoses cross-mapping

Vocabulary	Total number of diagnoses	Cross-mapping	
		Fully mapped (%)	Partially or not mapped (%)
NANDA	128	112 (87.5)	16 (12.5)
HHCC	146	131 (89.7)	15 (10.3)
Omaha	44	32 (72.7)	12 (27.3)
Total	318	275 (86.5)	43 (13.5)

HHCC, Home Health Care Classification; NANDA, North American Nursing Diagnosis Association.

Table 2 Results of nursing interventions cross-mapping

Vocabulary	Total number of diagnoses	Cross-mapping	
		Fully mapped (%)	Partially or not mapped (%)
NIC	433	344 (79.4)	89 (20.6)
HHCC	160	129 (80.6)	31 (19.4)
Omaha	63	45 (71.4)	18 (28.6)
Total	656	518 (79.0)	138 (21.0)

HHCC, Home Health Care Classification; NIC, Nursing Interventions Classification.

NANDA terms, 146 HHCC terms and 44 Omaha System terms. The ICNP Phenomena Classification described 87.5% of the NANDA diagnoses, 89.7% of the HHCC diagnoses and 72.7% of the Omaha System problem classification scheme (Table 1).

The total number of nursing interventions examined for cross-mapping in this study were 656: 433 NIC terms, 160 HHCC terms and 63 Omaha System terms. The ICNP Actions Classification described 79.4% of NIC interventions, 80.6% of HHCC interventions and 71.4% of the Omaha System interventions (Table 2).

There were 16 NANDA diagnoses (12.5%) that could not be mapped to the ICNP. Fifteen were mapped partially and one was not mapped completely (Table 3). There were 15 HHCC diagnoses (10.3%) that could not be mapped to the ICNP. Thirteen were mapped partially and two were not mapped completely (Table 4). There were 12 diag-

noses of the Omaha System (27.3%) that could not be mapped to the ICNP. Three were mapped partially and nine were not mapped completely (Table 5). There were 89 NIC interventions (20.6%) that could not be mapped to the ICNP. Forty-eight were mapped partially and 41 were not mapped completely (Table 6). There were 31 HHCC interventions (19.4%) that could not be mapped to the ICNP. Eight were mapped partially and 23 were not mapped completely (Table 7). There were 18 interventions of the Omaha System (28.6%) that could not be mapped to the ICNP. Three were mapped partially and 15 were not mapped completely (Table 8).

Inclusiveness of ICNP codes

To increase the inclusiveness of the ICNP, it is recommended that 32 codes (for focus axis) should be

Table 3 A list of North American Nursing Diagnosis Association (NANDA) nursing diagnoses with partial or no mapping

<i>Partially mapped (15)</i>	<i>Not mapped (1)</i>
<u>Altered health maintenance</u>	Social isolation
<u>Altered protection</u>	
<u>Altered role performance</u>	
<u>Altered sexuality patterns</u>	
<u>Anticipatory grieving</u>	
<u>Disorganized infant behaviour</u>	
<u>Dysfunctional ventilatory weaning response</u>	
<u>Impaired environmental interpretation syndrome</u>	
<u>Potential for enhanced organized infant behaviour</u>	
<u>Risk for disorganized infant behaviour</u>	
<u>Risk for injury</u>	
<u>Risk for perioperative positioning injury</u>	
<u>Risk for peripheral neurovascular dysfunction</u>	
<u>Risk for poisoning</u>	
<u>Risk for violence: Self-directed or directed at others</u>	

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

Table 4 A list of Home Health Care Classification (HHCC) nursing diagnoses of partial or no mapping

<i>Partially mapped (13)</i>	<i>Not mapped (2)</i>
<u>Anticipatory grieving</u>	Polypharmacy
<u>Endocrine alteration</u>	Social isolation
<u>Health maintenance alteration</u>	
<u>Injury risk</u>	
<u>Instrumental activities of daily living alteration</u>	
<u>Meaningfulness alteration</u>	
<u>Medication risk</u>	
<u>Musculoskeletal alteration</u>	
<u>Physical regulation alteration</u>	
<u>Poisoning risk</u>	
<u>Protection alteration</u>	
<u>Renal alteration</u>	
<u>Violence risk</u>	

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

Table 5 A list of the Omaha System Problem Classification Scheme of partial or no mapping

<i>Partially mapped (3)</i>	<i>Not mapped (9)</i>
<u>Abused child/adult</u>	Communication with community resources
<u>Antepartum/postpartum</u>	Dentition
<u>Speech and language</u>	Health care supervision
	Human sexuality
	Neighbourhood/workplace
	Other
	Prescribed medication regimen
	Sanitation
	Technical procedure

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

added to the ICNP Nursing Phenomena Classification. Table 9 shows details of this recommendation. However, we could not find an appropriate axis for *antepartum/postpartum*, *preoperative* that implied time in the ICNP Nursing Phenomena Classification. To increase the inclusiveness of the ICNP, it is recommended that 120 codes (102 codes for target axis, 17 codes for action type axis, and 1 code for location axis) should be added to the ICNP Nursing Actions Classification. Table 10 shows details of this recommendation.

Discussion

This study was aimed at examining the inclusiveness and the expressiveness of ICNP terms by cross-mapping them with four existing nursing terminologies: the NANDA taxonomy I; the Omaha System; the HHCC; and the NIC.

Cross-mapping process

The rules for the mapping procedure included using the guidelines for composing nursing diagnoses and nursing interventions from the ICNP, using the meaning of the concept (definition), and map to the most specific concept in the ICNP. Using the rules and expert reviews for validation, the researchers were able to achieve consensus on cross-mapping to the ICNP.

Table 6 A list of Nursing Interventions Classification (NIC) interventions of partial or no mapping

<i>Partially mapped (48)</i>	<i>Not mapped (41)</i>
<i>Bed rest care</i>	Acupressure
<i>Behaviour management</i>	Autotransfusion
<i>Body mechanics promotion</i>	Bedside laboratory testing
<i>Code management</i>	Birthing
<i>Conscious sedation</i>	Behaviour modification
<i>Controlled substance checking</i>	Bottle feeding
<i>Developmental enhancement</i>	Complex relationship building
<i>Embolus care: peripheral</i>	Critical path development
<i>Embolus care: pulmonary</i>	Delegation
<i>Emergency care checking</i>	Elopement precaution
<i>Family involvement</i>	Embolus precaution
<i>Fertility preservation</i>	Exercise therapy: balance
<i>Genetic counselling</i>	Fire setting precautions
<i>Health policy monitoring</i>	Health care information exchange
<i>Health screening</i>	Health education
<i>Health system guidance</i>	Kangaroo care
<i>Heat exposure treatment</i>	Laser precautions
<i>Haemodynamic regulation</i>	Latex precautions
<i>High-risk pregnancy care</i>	Leech therapy
<i>Immunization/vaccination administration</i>	Medication prescribing
<i>Insurance authorization</i>	Multidisciplinary care conference
<i>Invasive haemodynamic monitoring</i>	Non-nutritive sucking
<i>Laboratory data interpretation</i>	Order transcription
<i>Normalization promotion</i>	Organ procurement
<i>Oral health maintenance</i>	Peer review
<i>Oral health promoting</i>	Pneumatic tourniquet precautions
<i>Oral health restoration</i>	Preceptor: employee
<i>Pass facilitation</i>	Preceptor: student
<i>Patient rights protection</i>	Product evaluation
<i>Phototherapy: neonate</i>	Progressive muscle relaxation
<i>Quality monitoring</i>	Recreation therapy
<i>Reproductive technology management</i>	Respite care
<i>Research data collection</i>	Seclusion
<i>Risk identification</i>	Seizure precautions
<i>Security enhancement</i>	Simple guided imagery
<i>Seizure management</i>	Support group
<i>Self-responsibility facilitation</i>	Surgical precaution
<i>Sexual counselling</i>	Telephone consultation
<i>Smoking cessation assistance</i>	Therapy group
<i>Staff supervision</i>	Truth telling
<i>Supply management</i>	Ultrasound: limited obstetric
<i>Support system enhancement</i>	
<i>Sustenance support</i>	
<i>Technology management</i>	
<i>Traction/immunization care</i>	
<i>Value clarification</i>	
<i>Weight gain assistance</i>	
<i>Weight reduction assistance</i>	

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

Table 7 A list of Home Health Care Classification (HHCC) interventions of partial or no mapping

<i>Partially mapped (8)</i>	<i>Not mapped (23)</i>
<u>Bereavement support</u>	Bedbound care
<u>Environmental safety</u>	Behaviour care
<u>Equipment safety</u>	Bill of rights
<u>Health promotion</u>	Community special programs
<u>Individual safety</u>	Enema
<u>Interpersonal dynamics analysis</u>	Health history
<u>Stress control</u>	Home health aid service
<u>Violence control</u>	Instrumental activities of daily living
	Intake/Output
	Medical regimen orders
	Medication actions
	Medication side-effects
	Mental health history
	Other ancillary service
	Other community special program
	Other professional service
	Other specimen analysis
	Physical health care
	Physician contact
	Physician status report
	Psychosocial care
	Range of motion
	Speech therapist service

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

The cross-mapping did identify a number of challenges and issues of interest for further terminology development. For example, a number of concepts that could not be mapped to the ICNP needed more than two terms from the focus axis. Complex concepts such as violence are included in both NANDA and HHCC, as risk for violence. The definitions imply harming self or others. The ICNP identifies separate concepts for violence directed at self (self-harm) and violence directed at others (violence). Thus, to fully cross-map between NANDA or HHCC (risk for violence or violence risk) and ICNP terms, the researchers would have to break the rules and use two concepts from the ICNP focus axis to match the meaning of the NANDA or HHCC

Table 8 A list of the Omaha System Intervention Scheme of partial or no mapping

<i>Partially mapped (3)</i>	<i>Not mapped (15)</i>
<u>Day care/respice</u>	Anatomy/physiology
<u>Medical/dental care</u>	Behaviour modification
<u>Stress management</u>	Discipline
	Durable medical equipment
	Employment
	Interaction
	Laboratory findings
	Medication action/side-effects
	Nutritionist
	Other community resource
	Safety
	Signs/symptoms-mental/emotional
	Signs/symptoms-physical
	Support group
	Support system

Underlined terms could not be cross-mapped to the International Classification for Nursing Practice (ICNP).

concept. Thus, these NANDA and HHCC terms were identified as only partially cross-mapped.

Although the NANDA and HHCC violence concepts (combining harm to self or others) did not cross-map, the recommendation to add this concept would present a major challenge to the ICNP. In addition, there are subcategories or types of violence directed at others (e.g. hostility, abuse, mutilation and infanticide) and types of self-harm (self-mutilation, suicide attempt, suicide, drug use: overdose) in the ICNP. The most recent edition of NANDA (2001) reflects a similar change, separating the concept of violence to include 'risk for violence: directed at other' and 'risk for violence: self-directed'. Clearly, it can be recommended that the level of abstraction of concepts be further addressed in the evaluation of classification systems. The level of abstraction and the specificity of concepts in a terminology are dependent on the purposes and users of the terminology. Further testing of the ICNP should examine this issue.

Table 9 A list of terms that need to be added to the International Classification for Nursing Practice (ICNP) nursing phenomena

<i>Axis</i>	<i>Terms</i>	<i>Source vocabulary</i>
Focus (32)	Adult abuse	Omaha
	Anticipatory grieving	NANDA, HHCC
	Communication with community resources	Omaha
	Dentition	Omaha
	Endocrine	HHCC
	Environmental interpretation syndrome	NANDA
	Health care supervision	Omaha
	Health maintenance	HHCC, NANDA
	Infant behaviour	NANDA 3
	Injury	HHCC, NANDA
	Instrumental activities of daily living	HHCC
	Kidney	HHCC
	Language	Omaha
	Meaningfulness	HHCC
	Medication	HHCC
	Medication regimen	Omaha
	Musculoskeletal system	HHCC
	Neighbourhood/workplace	Omaha
	Neurovascular system	NANDA
	Other	Omaha
	Physical regulation	HHCC
	Poisoning	NANDA 3, HHCC
	Polypharmacy	HHCC
	Positioning injury	NANDA
	Protection	NANDA, HHCC
	Role performance	NANDA
	Sanitation	Omaha
	Sexuality	Omaha, HHCC
	Social isolation	NANDA, HHCC
	Technical procedure	Omaha
	Ventilatory weaning response	NANDA
	Violence	NANDA, HHCC
Time (2)	After/Before	Omaha
	Preoperative	NANDA

The number in parenthesis indicates the number of terms to be added.

HHCC, Home Health Care Classification; NANDA, North American Nursing Diagnosis Association.

Findings

As a result of cross-mapping, the ICNP could be used to represent or express the terminologies tested by >70%. The inclusiveness of the Omaha System was lower than that of the NANDA or the HHCC in terms of nursing phenomena. The Omaha System was developed for home care practice and had not been promoted as a classification for inpatient care. It had fewer and broader terms than the NANDA

and the HHCC. The NANDA and the HHCC have many similar terms.

To increase the inclusiveness of ICNP Nursing Phenomena Classification to be able to represent all the concepts that were partial or not mapped, it is recommended that 32 terms be added to the focus axis. Further study is needed to examine how these recommended additions might 'fit' into the ICNP or how they might affect the hierarchy of the Focus axis. Some of the diagnoses terms, such as

Table 10 A list of terms need to be added to the International Classification for Nursing Practice (ICNP) nursing actions

<i>Axis</i>	<i>Terms</i>	<i>Source vocabulary</i>
Action Type (17)	Autotransfusing	NIC
	Balancing	NIC
	Birthing	NIC
	Building	NIC
	Caution	NIC
	Clarifying	NIC
	Delegating	NIC
	Developing	NIC
	Evaluating	NIC
	Exchanging	NIC
	Involving	NIC
	Modifying	NIC2, Omaha
	Prescribing	NIC
	Preserving	NIC
	Procuring	NIC
	Sedating	NIC
	Transcribing	NIC
Target (102)	Acupressure	NIC
	Anatomy/physiology	Omaha
	Bed rest	NIC
	Behaviour	NIC4, Omaha, HHCC
	Bereavement	HHCC
	Bill of rights	HHCC, NIC
	Body mechanics	NIC
	Bottle feeding	NIC
	Code	NIC
	Community special programs	HHCC
	Controlled substance	NIC
	Complex relationship	NIC
	Critical path	NIC
	Dentistry	Omaha
	Discipline	Omaha
	Durable medical equipment	Omaha
	Elopement	NIC
	Embolus	NIC3
	Emergency care	NIC
	Employment	NIC
	Enema	HHCC
	Fire setting	NIC
	Gene	NIC
	Health	HHCC, NIC
	Health care information	NIC
	Health education	NIC
	Health history	HHCC
	Health policy	NIC
	Health system	NIC
	Heat exposure	NIC
	Haemodynamic	NIC
	High-risk pregnancy	NIC
	Home health aid service	HHCC
Immunization	NIC2	

Table 10 *Continued*

<i>Axis</i>	<i>Terms</i>	<i>Source vocabulary</i>
	Intake/output	HHCC
	Interaction	NIC
	Interpersonal dynamics	HHCC
	Insurance	NIC
	Kangaroo care	NIC
	Laboratory findings	NIC, Omaha
	Laser	NIC
	Latex	NIC
	Leech therapy	NIC
	Medical regimen orders	HHCC
	Medication	NIC
	Medication actions	HHCC, Omaha
	Medication side-effects	HHCC, Omaha
	Mental health history	HHCC
	Multidisciplinary care conference	NIC
	Non-nutritive sucking	NIC
	Normalization	NIC
	Nutritionist	Omaha
	Oral health	NIC3
	Order	NIC
	Organ	NIC
	Other ancillary service	HHCC
	Other community resource	Omaha
	Other community special programme	HHCC
	Other professional service	HHCC
	Other specimen	HHCC
	Pass	NIC
	Peer review	NIC
	Phototherapy	NIC
	Physical health	HHCC
	Physician contact	HHCC
	Physician status report	HHCC
	Pneumatic tourniquet	NIC
	Preceptor: employee	NIC
	Preceptor: student	NIC
	Product	NIC
	Productive technology	NIC
	Progressive muscle relaxation	NIC
	Psychosocial	HHCC
	Quality	NIC
	Range of motion	HHCC
	Recreation therapy	NIC
	Research data	NIC
	Respite	Omaha, NIC
	Risk	NIC2
	Safety	Omaha, HHCC
	Security	NIC
	Seizure	NIC2
	Self-responsibility	NIC
	Signs/symptoms – mental/emotional	Omaha
	Signs/symptoms – physical	Omaha

Table 10 Continued

Axis	Terms	Source vocabulary
	Simple guided imagery	NIC
	Smoking cessation	NIC
	Speech therapist service	HHCC
	Staff	NIC
	Stress	HHCC
	Supply	NIC
	Support group	Omaha
	Support system	NIC, Omaha
	Surgical precaution	NIC
	Sustenance	NIC
	Technology	NIC
	Telephone consultation	NIC
	Therapy group	NIC
	Truth telling	NIC
	Ultrasound: limited obstetric	NIC
	Weight gain	NIC
	Weight reduction	NIC
Location (1)	Bedbound	HHCC

The number in parenthesis indicates the number of terms to be added.
HHCC, Home Health Care Classification; NIC, Nursing Interventions Classification.

antepartum/postpartum, perioperative, could not be cross-mapped to any axis of vocabulary of the ICNP. Further review of representing the time or temporal aspects of nursing diagnoses is recommended.

In terms of the ICNP Nursing Actions Classification, it is recommended that 102 codes should be added to the target axis and 17 terms to the action-type axis. In the action-type axis, all except one term (i.e. modifying) were from the NIC because the HHCC and the Omaha System is organized in architecture more similar to the ICNP, with both action types and qualifiers (targets).

Zielstorff et al. (1998) have cross-mapped the diagnosis terms from the NANDA, the Omaha System and the HHCC to determine commonality and difference and to determine whether it is possible to develop a single vocabulary that contains the best features of all. Of 396 terms, only 63 terms were found to be the same or similar; 91 terms were found with no similar match, the remaining 242 had a narrower or a broader relationship. They concluded that the results were caused by differ-

ences in structure and incompatible taxonomic arrangements.

Bakken et al. (2000) thought that the prerequisite of a healthcare environment is characteristically complicated by a concept-orientated vocabulary. They defined nursing activities as three types: Delivery Mode; Activity Focus; and Recipient. They then attempted to cross-map 1039 terms that were used in patient records to the HHCC and the Omaha System intervention terms. As a result, 73.9% of terms used in the patient record, 91.3% of the HHCC and 63.5% of the Omaha System could be cross-mapped. In the study of Bakken et al. (2000), Delivery Mode corresponds to ICNP action type, Activity Focus corresponds to ICNP target, and Recipient corresponds to ICNP beneficiary. Generally, misunderstanding and disagreement in communication among individuals or expert groups are caused by the absence of a common vocabulary (Clark 1999; Bakken et al. 2000) and the need to develop a unified nursing language in a nursing system is urgent.

The ICNP multiaxial structure is conducive to

developing a UNLS. In the Beta Version, the ICNP is able to describe many of the existing terms in nursing classification. Therefore, it is recommended to continue to develop the ICNP as a unified nursing language system.

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