Development of the ICNP Based Cancer Nursing Information System

Kwuy Im Jung[a], Byung Suk Lee[b]

[a]Gospel Hospital, Kosin University, Korea
[b]College of Nursing, Keimyung University, Korea

Abstract

The purpose of this study was to develop the ICNP based cancer nursing information system according to the framework of nursing process. This study also tried to evaluate the usability by applying it to the cancer nursing practice. The system was developed based on System Development Life Cycle. Therefore, it is considered that the cancer nursing information system developed in this study can contribute to improvement of clinical usability under the nursing process and to enlargement of range of nursing records. In addition, the system developed in this study was based on ICNP, a standardized unified nursing terminology system, for controlling data related to cancer nursing effectively. The cancer nursing information system in this study can be applied in quality control of nursing care, follow-up care and research for the whole nursing field effectively as well as in the cancer nursing, and can promote the use of ICNP.

Keywords:

ICNP, Nursing Process, Cancer patients, Nursing Information System.

Introduction

Cancer is one of the most serious disease that needs an interest in a national dimension in increase of the incidence and the death rate in spite of rapid development of treatment methods. Currently, for the information management of cancer patients in Korea, activities for electric cancer registry are beginning at the hospital base.

However, level of the management of clinical data about cancer patients are different according to the level of computerization and policy of hospitals. Therefore, contents and quality of data are not the same, and questions about quality of cancer registration data are raised. And the decrease of accuracy in data collection process are raised as another problem[1].

In works of prevention of cancer, early discovery, treatment, a re-bow and relaxation, nurses are taking charge of very important roles. Spending most of the time with patients in their duty, nurses are collecting patient's data that are important for treatment and nursing care.

Therefore, there need to be an information system for collection, classification and communication of the large quantity of data nurses are collecting. For the development of an information system which is communicable in hospitals, standardized language classification system should be used as a language of the system.

ICNP as a nursing language classification system was developed by ICN(International Council of Nursing), and is accepted as an world wide nursing language system. ICNP can be an integrated nursing classification system that can represent existing nursing classification systems.

ICNP is composed of nursing phenomenon, nursing activity and nursing outcome with several axes and levels . Also, ICNP is satisfied with a standard of a nursing term reference model developed by ISO(International Standards Organization)[3].

Currently, studies related to ICNP were performed actively in Korea as well as in the world[4,5,6,7,8,9,10,11,12]. Therefore, development of the nursing information system that use the ICNP, as an integrated nursing language classification system, for efficient management of the cancer patients' nursing data is needed.

Methods

The purpose of this study was to develop the ICNP based cancer nursing information system according to the framework of nursing process and to evaluate the usability by applying it to the cancer nursing practice.

The system was developed based on SDLC(System Development Life Cycle). The procedures of system development and the results of each procedure were as follows.

Procedures and Results

System planning

At the system planning stage, the ICNP based standardized statements which would be used in the cancer nursing information system was developed.

To confirm nursing phenomenon statements, nursing action statements, nursing diagnoses and nursing interventions for cancer patients, the analyses were executed with user's demands, nursing documents of the cancer patients, and review of nursing literatures.

The user's demands were identified with a questionnaire and an interview and therefore, design of the information system became be connected with OCS(order communication system).

And, for the effective nursing plan, the system was requested to have automatic draw out of nursing interventions with the click of nursing diagnoses in the

+

nursing process framework. Also, structured nursing record was required in the information system.

Analyzing of nursing records, it was possible to find out nursing process in a similar and regular pattern. As a result of the analysis, 28,359 statements were compressed to 389 unique statements.

There were little nursing diagnoses and plans of nursing interventions in nursing records. So, nursing diagnoses(included in NANDA) and nursing interventions were determined through literature review. The statements about the nursing diagnoses and interventions that were extracted through the analysis of nursing records were connected with those in the literature.

The identified nursing statements such as nursing diagnoses and nursing interventions for the cancer patients were linked together. The linkage was verified by clinical experts group, two times.

As a result of the verification, 96 nursing phenomena statements, 44 nursing diagnoses, 117 nursing action statements and 78 nursing interventions were remained, and cross-mapping of these statements was executed according to the guidelines of cross-mapping of ICNP beta version with the experts group.
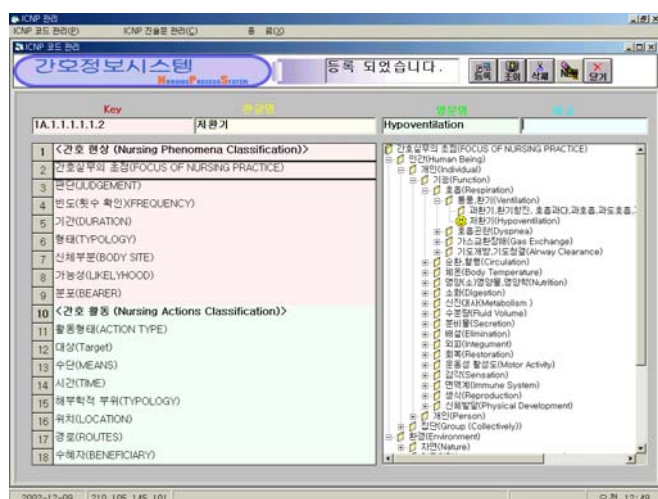

Figure 1-Screen for ICNP code management

System analysis

At the system analysis stage, data flow diagram was drawn after determining scope of development of the cancer nursing information system. The procedure of this stage included drawing a data flow diagram and investigating the range of system development.

All of the nursing assessments, nursing diagnoses, nursing interventions, nursing actions and nursing evaluations were connected in the framework of nursing process by using the linked language system developed at the previous system planning stage.

The information system was supposed to be a sub system of OCS. The system would deal with the nursing practice of cancer patients, and provide assistance for decision making of nursing care for the cancer patients.

The system structure used by users consisted of three modules and one database. And the structure used by system managers consisted of two modules and two databases. The data flow diagram consisted of structured computerization of four kinds of structured nursing records and narrative nursing records.

The system had an automatic format for selection of nursing diagnosis from nursing assessment, nursing intervention from nursing diagnosis. Nursing evaluation consists of the change of the nursing phenomenon in patients between the times of assessment..

System design

At system design stage, Input/Output screen and databases of cancer nursing information system were designed according to the data flow diagram. Databases were designed according to entity-relationship data model in this stage. ..

System implementation

At the system implementation stage, the problems of system was identified after demonstration of cancer nursing information system, education for users and exhibition operation of system and then the problems were corrected and complemented.

System evaluation

At the system evaluation stage, user satisfaction and system usability about the developed cancer nursing information system were evaluated. The score of user satisfaction was 4.20 ± 1.18 point out of 5.00 point.

As for the evaluation of system usability, it was executed on the subject of data about total 300 cases for the patients inputted in the system by using the cancer nursing information system that the 60 nurses participated on the evaluation of system satisfaction.
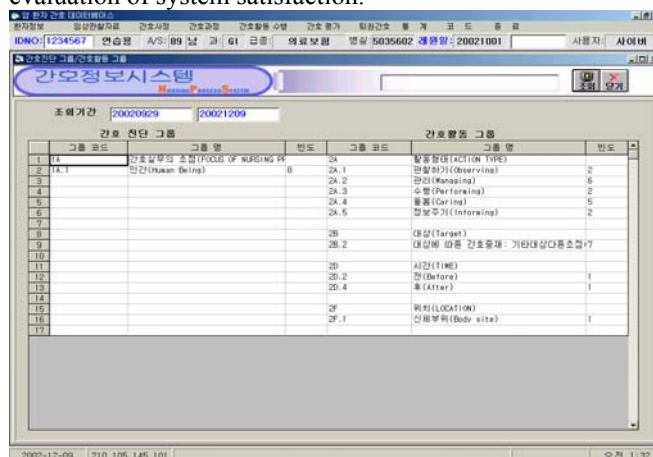

Figure 2-Screen for statistics of nursing phenomena and nursing actions ICNP code management

+

Acknowledgments

References

[1] Park CH. Prospect of cancer management policy. paper of 1st Korean Oncology Nursing, 2001; 1-28.

[2] Park HA., Cho IS., Hwang JI., Keun HK. Standardization and validity study of Korean Nomenclature of NOC(Nursing Outcome (Classification). Journal of Korean Academy Society of Adult Nursing, 2000; 12(3); 256-266.

[3] ISO/TC 215 WG3 N142. Integration of reference terminology model for nursing: Working Draft. London: International Standards Organization. 2001.

[4] Ryu DH. Cross-maaping for nursing problem and action statements in nursing records with International Classification for Nursing Practice. Seoul national university master's thesis. 2001.

[5] Myeong HJ., Park HA., Cho IS., Lee HS., Choi HJ. Development of ICNP browser for terminology-based electronic nursing recording system, Abstract of the 18th Korean Society of Medical Informatics, 2002, 240-241.

[6] Park HA., Cho IS., Kim JE., Yang YH. Standardization of nursing classification system: cross mapping of ICNP with others nursing classification system, Abstract of the 15th Korean Society of Medical Informatics, 1999, 185-186.

[7] Park HA., Cho IS., Kim JE., Choi YH., Lee HY., Kim HS., Park HK. Validity study of Korean translated nomenclatures of the ICNP. Journal of Korean Academy Society of Adult Nursing, 1999; 11(4); 631-650.

[8] Cho IS. Development of terminology-based nursing information model: applied to maternity nursing. Seoul national university doctor's thesis. 2002.

[9] Hyeon Sk. Cross mapping of ICNP with NANDA, HHCC, Omaha, & NIC for unified nursing language system develompemt, Seoul national university master's thesis. 2000.

[10] Alecu, S., Moisil, I., & Jitaru, E. (1999). SysTerN. a nursing terminology system based on ICNP. Studies in Health Technology & Informatics, 68, 921-925.

[11] Nielsen, G. H., Mortensen, R. A. (1996). The architecture for an international classification for nursing practice (ICNP). International Nursing Review, 43(6), 175-182.

[12] Ozbolt, J. (2000). Terminology standards for nursing: collaboration at the summit. Journal of the American Medical Informatics Association, 7(6), 517-522.

Address for Correspondence

KwuyIm Jung, PhD is Nurse of the Nursing Department at Gospel hospital. She was born and educated in Korea. Her major research interests are nursing information systems, computerized nursing record, web-based telemedicine and many other health related issues. Interested readers may contact the author, via either cgi@ns.kosinmed.or.kr or Nursing Department at Gospel hospital, Seo-gu Amnamdong 34, Busan, Korea, 602-702.

+