

Developing a Cancer Nursing Information System – Determining Core Nursing Diagnoses for the Six Most Common Cancers in Korea –

Lee, Byoungsook¹⁾ · Brenda K. Zierler²⁾

Introduction

Cancer has been the primary reason for deaths in Korea since 2000. The cancers most frequently occur in Korea are stomach, lung, liver, colon, and breast cancer. Cervical cancer is the second most common cancer in Korean women. These cancers are associated with high mortality rates in the Korean population. Due to these reasons, they were identified as the six most common cancers which need particular concern (Korean National Statistical Office, 2003). Nurses play important roles in the prevention, detection, and treatment of cancer. Cancer nursing information system can help nurses to manage a huge amount of data encountered in taking care of cancer patients and can improve the quality of nursing care for cancer patients by supporting decision making as well as providing databases. In particular, information systems using standard language systems can support nursing care more effectively. This study was conducted to determine core nursing diagnoses (CNDs) for a cancer nursing information system which will be designed to support the nursing process for cancer patients. CNDs were determined for the patient groups of each of the six most common cancers in Korea. McCloskey & Bulechek (2000) have defined core interventions as ‘a limited, central set of interventions that defines the nature of the specialty’. They also defined core interventions as those interventions that are

used most often or predominately by nurses in the specialty. Based on these definitions, The CNDs, in this study, are defined as a limited central set of the nursing diagnoses that are used most often or predominately by nurses in nursing care of the six cancer patient populations.

While designing this information system, nursing diagnosis is considered a core process because it provides the basis of nursing interventions to achieve outcomes in which the nurse is accountable (NANDA, 2001). Using this information system, the CNDs will be presented prior to others with causes and contributing factors when nurses are making nursing diagnoses for these patients. The main objective for the determination of CNDs in this study is to increase the perceived usefulness and the perceived usability of the information system by supporting nursing diagnosis. According to the Information technology adoption model (Dixon, 1999), these two perceptions are the key factors that lead to the successful adoption and utilization of Information Technology.

As one of the internationally approved standardized nursing languages, a set of North American Nursing Diagnoses Association (NANDA) nursing diagnoses was recognized to have adaptability in Korea (Yoo, Ko, Sohn, & Park, 1997). Thus, CNDs were selected from NANDA Taxonomy II (NANDA, 2001) in this study. To determine CNDs for each of the six patient groups, a survey and analysis of patient

Key words : Nursing diagnosis, Information system

1) Professor, College of Nursing, Keimyung University(Corresponding author E-mail: lbs@kmu.ac.kr)

2) Associate Professor, School of Nursing, University of Washington

투고일: 2007년 3월 26일 심사완료일: 2007년 6월 15일

records were performed. The survey was performed to identify the nursing diagnoses perceived to be used most often for each of the six patient groups because the nursing diagnoses are not actively used at the present time in Korea. The analysis of patient records was performed to verify the findings of survey by identifying nursing diagnoses actually used in nursing care of the cancer patients.

Methods

Survey

Participant: The participants were experienced clinical nurses caring cancer patients for two years or more in academic hospitals or cancer centers in metropolitan areas, where the nurses are expected to be aware of NANDA nursing diagnoses with their regular or continuing educations and ready to use nursing diagnoses. Prior to the selection of the participants, appropriate hospitals were selected, and the participants keeping with the criteria were selected from these hospitals. To select eligible participants, information about the professional experiences of the nurses working at the medical, surgical, or oncology nursing units was taken from the head nurses of the units. From the list of the eligible participants, 15-20 participants who agreed to participate were chosen from each hospital. As a result, 220 clinical nurses from 11 academic hospitals and two cancer centers in four metropolitan areas including Seoul participated in the data collection.

Instrument: A questionnaire to identify the NANDA nursing diagnoses which will be used most frequently in the nursing care of each of the patient groups of the six most common cancers in Korea. The nursing diagnoses from NANDA Taxonomy II (NANDA, 2001) were presented in this questionnaire and a question, 'Select ten nursing diagnoses that will be used most frequently for each of the six patient groups from the following NANDA nursing diagnoses, not in order.', was asked to the participants.

Data collection and analysis: Thirteen assistants working as staff nurses at each of the hospitals confirmed the eligibility and agreement of the participants, delivered and gathered the questionnaires. For responding to the questionnaires, the participants were informed about the purpose of the questionnaires. A total of 219 participants from 220 participants completed the questionnaires. Data collection was performed

from March 1st to April 30th, 2004. Using SPSS Win 11.0, descriptive statistics were done to get the frequency and percentages of the participants' choices of nursing diagnoses for each of the six patient groups.

Analysis of patient records

Subjects: A total of 72 patient records, twelve for each of the six patient groups from six university hospitals recorded from August 1st, 2002 to July 30th, 2003 were used for the analysis. They were analyzed to identify the nursing diagnoses or nursing problems actually used in the nursing process for the patients and to verify the survey findings. Inclusion criteria of the patient records were (1) seven hospital days or more (2) existence of nursing diagnoses or nursing problems in the record, and (3) consistent and substantial nursing records. The records of the patients admitted only for diagnosis and the electronic patient records were excluded. When the copies of the patient records were obtained from the medical record offices with the permission of the managers, the names and patient record numbers were removed to protect the privacy of the patients. The patient records used in this study covered 1,502 hospital days and the average hospital day was 20.86.

Data collection and analysis: To identify the nursing diagnoses in the patient records, the lists of nursing diagnoses or nursing problems were reviewed. Then, the statements recorded in the lists were collected and cross-mapped with the nursing diagnoses from NANDA Taxonomy II. The statements which were not cross-mapped with NANDA nursing diagnoses were classified into non-NANDA nursing diagnoses derived from the language of International Classification of Nursing Practice (ICNP) 2002. Review of the patient records and cross-mapping of the statements were separately performed by an author and two other reviewers who had experience in analyzing the records of cancer patients. For the nursing diagnoses the cross-mapping was not consistent among the reviewers, discussion was done among the reviewers for the agreements. The frequency and percentage of the nursing diagnoses identified from the cross-mapping were manually obtained. The nursing diagnoses, Acute and Chronic pain separated in NANDA Taxonomy II were integrated into Pain because they were not distinctively recorded in most of the patient records.

Determination of CNDs

An expert group which was composed to develop the languages of the cancer nursing information system participated in determining CNDs. Group members included six experienced clinical nurses working at medical, surgical, or hospice nursing units for three years or more in an academic hospital and had master degrees or higher education. They reviewed NANDA nursing diagnoses selected in the survey and compared them with the nursing diagnoses identified in the analysis of patient records. The findings of the analysis of patient records were used to verify and supplement the findings of the survey. Consequently, the expert group members determined the NANDA nursing diagnoses selected by 20% of the participants or more in the survey as the CNDs for each group. This criteria was determined after reviewing nursing diagnoses within the criteria, which were recognized in high frequency for the nursing care of the populations by expert group members, and considering adequate number, 15~20, of CNDs for the convenience of nurses in choosing nursing diagnoses.

Results

Characteristics of the survey participants

The mean age of the survey participants was 29.9 (SD 5.5) years and 46.1% of them were 26-30years old. The mean clinical experience of the participants was 7.3 years and 52.1% of them had clinical experience of five years or less. The mean clinical experience in caring for cancer patients of the participants was 5.8 (SD 4.2) years and 63.9% of them had experience of five years or less. 84.0% of the participants were staff nurses and 15.1% of them were head or charge nurses. Two of the participants (0.9%) were oncology nurse specialists. Regarding their educational levels, 63.5% of the participants had a bachelor degree or higher. Most of the participants worked at medical or surgical units (86.3%), and a few of them worked at oncology (9, 4.1%) and hospice units (3, 1.4%) <Table 1>.

Findings of the survey

Ten NANDA nursing diagnoses expected to be most frequently used for each of the six patient groups were

<Table 1> Characteristics of the survey participants

| (n=219) | | | |
|--|---------------------|--------|-------|
| Characteristics | Categories | Number | % |
| Region | Seoul & Gyeonggi | 90 | 41.1 |
| | Pusan | 70 | 32.0 |
| | Taegu | 59 | 26.9 |
| Age | 25yrs or less | 45 | 20.5 |
| | 26 yrs ~30 yrs | 101 | 46.1 |
| | 31 yrs ~35 yrs | 37 | 16.9 |
| | 36 yrs ~40 yrs | 22 | 10.0 |
| | 41 yrs or more | 14 | 6.4 |
| Clinical experience | 5 yrs or less | 114 | 52.1 |
| | 6 yrs ~10 yrs | 52 | 23.7 |
| | 11 yrs ~15 yrs | 32 | 14.6 |
| | 16 yrs ~20 yrs | 17 | 7.8 |
| | 21 yrs or more | 4 | 1.8 |
| Experience in caring for cancer patients | 5 yrs or less | 140 | 63.9 |
| | 6 yrs ~10 yrs | 51 | 23.3 |
| | 11 yrs ~15 yrs | 19 | 8.7 |
| | 16 yrs or more | 9 | 4.1 |
| Position | Staff nurse | 184 | 84.0 |
| | Head/Charge nurse | 33 | 15.1 |
| | Oncology specialist | 2 | 0.9 |
| Education | Master | 16 | 7.3 |
| | Baccalaureate | 123 | 56.2 |
| | Diploma | 80 | 36.5 |
| Working areas | Med. | 98 | 44.7 |
| | Surg. | 91 | 41.6 |
| | Ob. & Gy. | 18 | 8.2 |
| | Oncology | 9 | 4.1 |
| | Hospice | 3 | 1.4 |
| Total | | 219 | 100.0 |

selected by each participant. Total 192~199 participants selected NANDA nursing diagnoses for each of the patient groups. Imbalanced nutrition: Less than body requirements for stomach and liver ca. (161, 82.1%; 124, 62.3%), Impaired gas exchange for lung ca. (135, 69.6%), Constipation for colon ca. (125, 64.4%), Disturbed body image for breast ca. (130, 66.3%) and Sexual dysfunction for cervical ca. (112, 58.3%) were selected most for each of the populations respectively. Pain, both acute and chronic, was selected most in all patient groups. The frequencies and percentages of both pains were 195(99.5%) in stomach ca. patients, 159(82.0%) in lung ca. patients, 161(80.9%) in liver ca. patients, 152(78.4%) in colon ca. patients, 128(65.3%) in breast ca. patients, and 127(66.1%) in cervical ca. patients. Among 20 NANDA nursing diagnoses expected as will be most frequently used for each of the six patient groups, four nursing diagnoses, Anxiety, Disturbed sleep pattern, Risk for infection and Fatigue were included in all groups <Table 2>.

<Table 2> Top 20 NANDA nursing diagnoses expected as to be frequently used for each of the patient groups

| Rank | Stomach Ca. (n=196) | | Lung Ca. (n=194) | | Liver Ca. (n=199) | |
|------|---|-----------|---|-----------|---|-----------|
| | Nursing diagnosis | Freq.(%) | Nursing diagnosis | Freq.(%) | Nursing diagnosis | Freq.(%) |
| 1 | Imbalanced nutrition: Less than body requirements | 161(82.1) | Impaired gas exchange | 135(69.6) | Imbalanced nutrition: Less than body requirements | 124(62.3) |
| 2 | Acute pain | 98(50.0) | Impaired spontaneous ventilation | 134(69.1) | Fatigue | 116(58.3) |
| 3 | Constipation | 97(49.5) | Ineffective breathing pattern | 114(58.8) | Chronic pain | 109(54.8) |
| 4 | Nausea | 93(47.4) | Chronic pain | 94(48.5) | Risk for imbalanced fluid volume | 97(48.7) |
| 5 | Chronic pain | 89(45.4) | Disturbed sleep pattern | 85(43.8) | Acute confusion | 84(42.2) |
| 6 | Diarrhea | 69(35.2) | Fatigue | 75(38.7) | Risk for Infection | 74(37.2) |
| 7 | Risk for imbalanced fluid volume | 68(34.7) | Anxiety | 75(38.7) | Disturbed sleep pattern | 68(34.2) |
| 8 | Anxiety | 66(33.7) | Risk for aspiration | 75(38.7) | Risk for impaired skin integrity | 63(31.7) |
| 9 | Disturbed sleep pattern | 65(33.2) | Imbalanced nutrition: Less than body requirements | 73(37.6) | Excess fluid volume | 61(30.7) |
| 10 | Impaired swallowing | 63(32.1) | Ineffective airway clearance | 71(36.6) | Anxiety | 60(30.2) |
| 11 | Risk for infection | 61(31.1) | Acute pain | 65(33.5) | Nausea | 55(27.6) |
| 12 | Knowledge deficit | 60(30.7) | Risk for Infection | 64(33.0) | Powerlessness | 52(26.1) |
| 13 | Fluid volume deficit | 58(29.6) | Risk for imbalanced fluid volume | 49(25.3) | Acute pain | 52(26.1) |
| 14 | Delayed surgical recovery | 56(28.6) | Ineffective tissue perfusion | 44(22.7) | Constipation | 50(25.1) |
| 15 | Fatigue | 48(24.5) | Death anxiety | 42(21.6) | Ineffective tissue perfusion | 44(22.1) |
| 16 | Impaired oral mucous membrane | 40(20.4) | Constipation | 40(20.6) | Death anxiety | 41(20.6) |
| 17 | Hopelessness | 38(19.4) | Hopelessness | 38(19.6) | Knowledge deficit | 40(20.1) |
| 18 | Impaired urinary elimination | 38(19.4) | Fear | 36(18.6) | Hyperthermia | 39(19.6) |
| 19 | Death anxiety | 38(19.4) | Impaired physical mobility | 36(18.6) | Ineffective health maintenance | 38(19.1) |
| 20 | Hyperthermia | 33(16.8) | Activity intolerance Hyperthermia | 34(17.5) | Impaired skin integrity | 37(18.6) |

| Rank | Colon Ca. (n=194) | | Breast Ca. (n=196) | | Cx. Ca. (n=192) | |
|------|---|-----------|--------------------------------------|-----------|---|-----------|
| | Nursing diagnosis | Freq.(%) | Nursing diagnosis | Freq.(%) | Nursing diagnosis | Freq.(%) |
| 1 | Constipation | 125(64.4) | Disturbed body image | 130(66.3) | Sexual dysfunction | 112(58.3) |
| 2 | Diarrhea | 117(60.3) | Hopelessness | 84(42.9) | Anxiety | 77(40.1) |
| 3 | Imbalanced nutrition: Less than body requirements | 101(52.1) | Sexual dysfunction | 72(36.7) | Chronic pain | 71(37.0) |
| 4 | Chronic pain | 86(44.3) | Acute pain | 66(33.7) | Disturbed body image | 70(36.5) |
| 5 | Disturbed body image | 73(37.6) | Anxiety | 66(33.7) | Low self-esteem | 67(34.9) |
| 6 | Risk for imbalanced fluid volume | 70(36.1) | Low self esteem | 66(33.7) | Hopelessness | 66(34.4) |
| 7 | Risk for Infection | 67(34.5) | Self-care deficit: Dressing/grooming | 63(32.1) | Impaired urinary elimination | 62(32.3) |
| 8 | Acute pain | 66(34.0) | Disturbed sleep pattern | 63(32.1) | Fatigue | 58(30.2) |
| 9 | Bowl incontinence | 54(27.8) | Chronic pain | 62(31.6) | Acute pain | 58(30.2) |
| 10 | Risk for impaired skin integrity | 49(25.3) | Fear | 55(28.1) | Disturbed sleep pattern | 57(29.7) |
| 11 | Self-care deficit: Bathing/hygiene | 48(24.7) | Risk for infection | 55(28.1) | Chronic grieving | 56(29.2) |
| 12 | Anxiety | 43(22.2) | Chronic low self-esteem | 52(26.5) | Knowledge deficit | 54(28.1) |
| 13 | Disturbed sleep pattern | 43(22.2) | Chronic grieving | 51(26.0) | Imbalanced nutrition: Less than body requirements | 50(26.0) |
| 14 | Knowledge deficit | 43(22.2) | Knowledge deficit | 51(26.0) | Fear | 49(25.5) |
| 15 | Risk for constipation | 41(21.1) | Fatigue | 47(24.0) | Powerlessness risk for Infection | 46(24.0) |
| 16 | Fatigue | 40(20.6) | Disturbed personal identity | 44(22.4) | | |
| 17 | Delayed surgical recovery | 40(20.6) | Powerlessness | 39(19.9) | Delayed surgical recovery | 45(23.4) |
| 18 | Low self-esteem | 39(20.1) | Self-care deficit: Bathing/hygiene | 38(19.4) | Disturbed personal identity | 44(22.9) |
| 19 | Nausea | 36(18.5) | Nausea | 37(18.8) | Nausea | 42(21.9) |
| 20 | Hopelessness | 34(17.5) | Impaired social interaction | 34(17.3) | Constipation | 41(21.4) |
| | | | Risk for impaired skin integrity | | | |

Findings of the analysis of patient records

Sufficient numbers of nursing diagnoses were not found in the patient records. From the 72 patient records, 143 statements

of nursing diagnoses, two statements per each patient record, were identified. Among these, 135 statements (94.4%) were cross-mapped with 15 NANDA nursing diagnoses and eight were not. NANDA nursing diagnoses such as Pain (20,

<Table 3> Nursing diagnoses identified in the 72 patient records

| Rank | Nursing diagnosis | Freq. (%) | No. of nursing diagnoses in each group of the cancer patients | | | | | |
|------|--|------------|---|---------|---------|---------|---------|---------|
| | | | St. Ca. | Lu. Ca. | Li. Ca. | Co. Ca. | Br. Ca. | Cx. Ca. |
| 1 | Pain | 20(14.0) | 3 | 5 | 3 | 2 | 3 | 4 |
| 2 | Imbalanced nutrition: Less than body requirement | 14(9.8) | 4 | 1 | 2 | 2 | 2 | 3 |
| 3 | Excess fluid volume | 13(9.1) | 2 | 2 | 3 | 2 | 3 | 1 |
| 4 | Fatigue | 11(7.7) | 3 | 2 | 1 | 1 | 3 | 1 |
| 4 | Ineffective breathing pattern | 11(7.7) | 4 | 3 | 2 | | 1 | 1 |
| 6 | Risk for imbalanced fluid volume | 10(7.0) | 3 | 3 | 1 | 2 | 1 | |
| 6 | Nausea | 10(7.0) | 2 | 1 | 2 | 1 | 2 | 2 |
| 8 | Ineffective tissue perfusion | 9(6.3) | 1 | 3 | 1 | 2 | 2 | |
| 8 | Hyperthermia | 9(6.3) | 2 | | 2 | 2 | 1 | 2 |
| 8 | Anxiety | 9(6.3) | 1 | 2 | 2 | 2 | 1 | 1 |
| 11 | Disturbed sleep pattern | 6(4.2) | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | Anorexia* | 6(4.2) | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | Impaired urinary elimination | 5(3.5) | 1 | | | 2 | | 2 |
| 14 | Activity intolerance | 4(2.8) | 1 | | 1 | 1 | 1 | |
| 15 | Acute confusion | 3(2.1) | 1 | | 2 | | | |
| 16 | Impaired skin integrity | 1(0.7) | | | | | 1 | |
| 16 | Depression* | 1(0.7) | | 1 | | | | |
| 16 | Dyspepsia* | 1(0.7) | | | | | 1 | |
| | Total | 143(100.0) | 30 | 25 | 24 | 21 | 24 | 19 |

* Non-NANDA nursing diagnoses derived in this study from ICNP

14.0%), and Imbalanced Nutrition: Less than body requirement (14, 9.8%), Excess fluid volume (13, 9.1%), Fatigue (11, 7.7%), Ineffective Breathing Pattern (11, 7.7%), Risk for imbalanced fluid volume (10, 7.0%), and Nausea (10, 7.0%) were found more frequently than others. Consistent with the results of the survey, the NANDA nursing diagnoses, Pain, Imbalanced nutrition: Less than body requirement, and the nursing diagnoses related to the body fluid volume were also found frequently in the patients' records. The eight statements which were not cross-mapped with NANDA nursing diagnoses were classified into the nursing diagnoses derived from ICNP, 'Anorexia' (6, 4.2%), 'Depression' (1, 0.7%), and 'Dyspepsia' (1, 0.7%) <Table 3>.

CNDs for each of the patient groups of the six most common cancers in Korea

From 16 to 20 NANDA nursing diagnoses were respectively determined as CNDs for each of the six patient groups. The nursing diagnoses selected as will be most frequently used for the patient groups in the survey were found consistent with the nursing diagnoses identified in the analysis of patient record relatively well. Based on these findings, the NANDA nursing diagnoses which were selected by 20% of the

participants or more as will be most frequently used for each of the patient groups of the six most common cancers in Korea were determined as CNDs for the patient groups by the expert group members.

Six nursing diagnoses, Acute pain, Chronic pain, Anxiety, Disturbed sleep pattern, Risk for infection and Fatigue were the CNDs included in all patient groups. The CNDs, Imbalanced nutrition: Less than body requirement, Constipation and Knowledge deficit were included in five patient groups and Risk for imbalanced fluid volume was included in four patient groups <Table 4>.

Discussion

Numbers of CNDs for each of the patient groups of the six most common cancers in Korea were from 16 to 20 respectively. Ten CNDs, Acute pain, Chronic pain, Anxiety, Disturbed sleep pattern, Risk for infection, Fatigue, Imbalanced nutrition: Less than body requirement, Constipation, Knowledge deficit and Risk for imbalanced fluid volume were common in most of the groups. These nursing diagnoses are consistent with the nursing problems found in nursing records of cancer patients (Jung, 2002), and the nursing problems identified by terminal cancer patients (Kim, 2003). They are also consistent with the

<Table 4> CNDs for the patient groups of the six most common cancers in Korea which were determined for a cancer nursing information system

| | Stomach Ca.(16) | Lung Ca.(16) | Liver Ca.(17) | Colon Ca.(18) | Breast Ca.(16) | Cervical Ca.(20) |
|-------------|--------------------|--------------------|--------------------|--------------------------|--------------------|--------------------|
| C N D | Imb. Nut: LTBR | Imp. Gas Exch. | Imb. Nut: LTBR | Constipation | Dis. Bod. Ima. | Sexual dysfunction |
| | Acute pain | Imp. Sp. Vent. | Fatigue | Diarrhea | Hopelessness | Anxiety |
| | Constipation | Ineff. Br. Pat. | Chronic pain | Imb. Nut: LTBR | Sexual dysfunction | Chronic pain |
| | Nausea | Chronic pain | R. Im Fl. Vol. | Chronic pain | Acute pain | Dis. Bod. Ima. |
| | Chronic pain | Dist. Sl. Pat. | Acute confusion | Dis. Bod. Ima. | Anxiety | Low self-esteem |
| | Diarrhea | Fatigue | Risk for Infection | R. Im Fl. Vol. | Low self-esteem | Hopelessness |
| | R. Im. Fl. Vol. | Anxiety | Dist. Sl. Pat. | Risk for Infection | S-C Def.:Dr./Gr. | Imp. Ur. Elim. |
| | Anxiety | R. Aspir. | R Imp. Sk. Int. | Acute pain | Dist. Sl. Pat. | Fatigue |
| | Dist. Sl. Pat. | Imb. Nut: LTBR | Fl. Vol. Excess | Bowel Incontinence | Chronic pain | Acute pain |
| | Imp. Swal. | Ineff. Air. Cl. | Anxiety | R Imp. Sk. Int. | Fear | Dist. Sl. Pat. |
| | Risk for Infection | Acute pain | Nausea | S-C Def: Bat/Hyg Anxiety | Risk for Infection | Chronic grieving |
| | Knowledge Deficit | Risk for Infection | Powerlessness | Dist. Sl. Pat. | Chr. Low S-Est. | Knowledge Deficit |
| | Fl. Vol. Deficit | R. Im. Fl. Vol. | Acute pain | Knowledge Deficit | Chronic grieving | Imb. Nut: LTBR |
| | Del. Surg. Rec. | Ineff. Tiss. Perf. | Constipation | Risk for constipation | Knowledge Deficit | Fear |
| | Fatigue | Death Anxiety | Ineff. Tiss. Perf. | Fatigue | Fatigue | Powerlessness |
| | Imp. O Muc. Mem | Constipation | Death anxiety | Del. Surg. Rec. | Dist. Per. Id. | Risk for infection |
| | | Knowledge deficit | Low self-esteem | | Del. Surg. Rec. | |
| | | | | | Dist. Per. Id. | |
| | | | | | Nausea | |
| | | | | | Constipation | |

CND: Core nursing diagnoses; Chr. Low S-Est.: Chronic low self-esteem; Del. Surg. Rec.: Delayed Surgical Recovery; Dis. Bod. Ima.: Disturbed body image; Dist. Per. Id: Disturbed personal identity; Dist. Sl. Pat. : Disturbed sleep pattern; Ex. Fl. Vol.: Excess Fluid volume; Fl. Vol. Def.: Fluid Volume Deficit; Imb. Nut: LTBR: Imbalanced nutrition: Less than body requirement; Imp. Gas Exch: Impaired gas exchange; Imp. O Muc. Mem: Impaired oral mucous membrane; Imp. Sp. Vent.; Impaired spontaneous ventilation; Imp. Swal.: Impaired swallowing; Imp. Ur. Elim.: Impaired urinary elimination; Ineff. Air. Cl.: Ineffective airway clearance; Ineff. Br. Pat.: Ineffective breathing pattern; Ineff. Tiss. Perf: Ineffective tissue perfusion; R. Aspir.: Risk for aspiration; R. Im. Fl. Vol: Risk for imbalanced fluid volume; R Imp. Sk. Int.: Risk for impaired skin integrity; S-C Def: Bat/Hyg.: Self-care Deficit: Bathing/Hygiene; S-C Def.: Dr./Gr. : Self-care deficit: Dressing/Grooming

common symptoms of cancer patients (Lee et al., 1998). Among the CNDs included in all patient groups, Pain, the CND selected most by the participants, has been recognized as the most frequent and serious problem of the cancer patients which disturbs patients' daily activities and causes hopelessness and powerlessness during treatments and symptom management. Risk for infection is another serious problem which frequently occurs due to a decline of body immunity caused by cancer itself or anticancer therapies. Chemotherapy was reported as causing serious oral infection and bleeding (Holmes, 1991; Sitzia, Hughes, & Sobrido, 1995). Clinically, nursing activities for the prevention of infection occupy a significant proportion of nursing care for cancer patients. Fatigue or tiredness was also reported as one of the most serious problems in cancer patients (Hur et al., 2002; Iop, Manfredi & Bonura, 2004; Stone et al., 2000; Tishelman, Degner, & Mueller, 2000). It is recognized as an inevitable side effect of cancer treatments such as surgery, chemotherapy and radiation therapy (Ekfors & Petersson, 2004; Irvine, Vincent, Graydon, Bubela, &

Thompson, 1994; Molassiotis & Chan, 2001; Yang, 2002). In particular, it was reported as the most frequent and intense subjective symptom in breast cancer patients (Gelinis & Fillion, 2004). Nevertheless, cancer-fatigue went unnoticed by patients in most cases and professional treatment or advice was not given for that (Stone et al., 2000). Anxiety and Disturbed sleep pattern are also serious problems of cancer patients. Sela, Watanabe & Nekolaichuk (2005) reported 72% of the cancer patients participated in their study had a wide variety of sleep disturbances after cancer diagnosis and this problem had highest correlation with anxiety and fear. Kristjanson & Ashcroft (1994) have revealed cancer patients had different psychological problems according to the stage of the disease. According to them, the cancer patients have feelings of fear, anger and unreality at the early stage, feelings of uncertainty, sadness, fear and anger at the time of recurrence, and anxiety toward death and powerlessness at the terminal stage. The fear of unknown (Ali & Khalil, 1991) and the fear of recurrence (Steginga, Occhipinti, Wilson, & Dunn, 1998) were particularly

serious in breast cancer patients. Because chemotherapy and radiotherapy are accompanied with G-I disturbances in most cases (Dodd, Onishi, Dibble & Larson, 1996; Yang, 2002), they tend to induce nutritional deficiencies in cancer patients (Lindsey, Piper, & Stotts, 1982; Soh, Park, & Lee, 1999; Yang, Kwon, & Kim, 2001). Disturbance of body image due to the loss of hair was presented as one of the most important problems in cancer patients (Sitzia et al., 1995; Yang, 2002). Consistent with the results of the survey, the NANDA nursing diagnoses, Pain, Imbalanced nutrition: Less than body requirement, Anxiety, Disturbed sleep pattern, Nausea, Hyperthermia, and Anxiety were also frequently found in patients' records even though sufficient numbers of nursing diagnoses were not found. Based on these findings, which were meaningful even though not sufficient, the validity of the common CNDs for cancer patients could be verified.

Hur et al. (2002) have reported the symptoms of cancer patients are different according to the sites of cancers. This report supports the CNDs which were determined for specific populations in this study. The CNDs included only one patient group are mostly related to the functional disturbances of the organs involved by diseases. For example, several nursing diagnoses related to the functional disturbances of respiratory system were included in the CNDs for lung cancer patients, and were consistent with the symptom distresses of lung cancer patients (Lobchuck, Kristjanson, Degner, Blood, & Sloan, 1997). Acute confusion and Excess fluid volume for liver cancer patients, Bowel incontinence for colon cancer urinary patients, Sexual dysfunction for breast cancer patients, Sexual dysfunction and Impaired urinary elimination for cervical cancer patients were the CNDs related to the functional disturbances of the involved organs. The CNDs about Self-care deficit for breast or colon cancer patients can be explained as the result of the changes in the pattern of self-care because of treatment in those populations (Dodd, 1988).

As adopting these CNDs, the cancer nursing information system will have usefulness and usability particularly when making nursing diagnoses. And the cancer nursing information system adopting these CNDs can improve the quality of nursing care by supporting nursing process. The data related to CNDs stored in the database will provide useful information for researches about nursing problems in cancer patients. But, due to the fact that these CNDs were mainly determined

basically based on the frequencies of use in hospital settings, they could have some limitations in presenting the importance of nursing problems. Tishelman et al. (2000) have specified that the frequency and intensity of nursing diagnoses is not necessarily consistent to the importance of the diagnoses. The possibility of guiding nurses to choose CNDs without careful consideration regarding patients' problems should be considered. This problem may be resolved when CNDs are used with possible causes and contributing factors. And, nursing diagnoses newly added in NANDA 2006 should be considered when the cancer nursing information system is developed.

Conclusion

In this study, 16 to 20 CNDs for each group of the six most common cancer patients in Korea were determined for a cancer nursing information system which supports nursing process. The validity of the CNDs determined in this study for each of the six most common cancers in Korea was verified. When adopted in cancer nursing information systems, these CNDs will increase the usefulness and usability of those systems and improve the quality of nursing care by facilitating and supporting nursing processes for cancer patients. Studies for empirical validation of these CNDs in actual nursing practice are recommended. Also, studies using data from databases adopting these CNDs are recommended.

References

- Ali, N. S., & Khalil, H. Z. (1991). Identification of stressors, level of stress, coping strategies, and coping effectiveness among Egyptian mastectomy patients. *Cancer Nurs*, 14(5), 232-239.
- Dixon, D. R. (1999). The behavioral side of information technology. *Int J Med Inform*, 56, 117-123.
- Dodd, M. J. (1988). Patterns of self-care in patients with breast cancer. *West J Nurs Res*, 10(1), 7-24.
- Dodd, M. J., Onishi, K., Dibble, S. L., & Larson, P. J. (1996). Differences in nausea, vomiting, and retching between younger and older outpatients receiving cancer chemotherapy. *Cancer Nurs*, 19(3), 155-161.
- Ekfors, H., & Petersson, K. (2004). A qualitative study of the experiences during radiotherapy of Swedish patients suffering from lung cancer. *Oncol Nurs Forum*, 31(2), 329-334.

- Gelinas, C., & Fillion, L. (2004). Factors related to persistent fatigue following completion of breast cancer treatment. *Oncol Nurs Forum*, 31(2), 269-278.
- Holmes, S. (1991). The oral complication of specific anticancer therapy. *Int J Nurs Stud*, 28(4), 343-360.
- Hur, H. K., Lee, E. H., Lee, W. H., So, H. S., Chung, B. Y., & Kang, E. S. (2002). Symptom occurrence related to disease characteristics of adult patients with cancer. *J Korean Acad Soc Adul Nurs*, 14(3), 411-417.
- Iop, A., Manfredi, A. M., & Bonura, S. (2004). Fatigue in cancer patients receiving chemotherapy: An analysis of published studies. *Ann Oncol*, 15(5), 712-720.
- Irvine, D., Vincent, L., Graydon, J. E., Bubela, N., & Thompson, L. (1994). The prevalence and correlates of fatigue in patients receiving treatment with chemotherapy and radiotherapy. A comparison with the fatigue experienced by healthy individuals. *Cancer Nurs*, 17(5), 367-378.
- Jung, K. I. (2002). *Development of the ICNP based cancer nursing information system*. Unpublished doctoral dissertation, Keimyung University, Daegu.
- Kim, K. R. (2003). *Contribution of nursing interventions to solve nursing problems in terminal cancer patients*. Unpublished master's thesis, Keimyung University, Daegu.
- Korean National Statistical Office. (2003). *The causes of cancers*. Korean Statistics Information System, Seoul.
- Kristjanson, L. K., & Ashcroft, T. (1994). The family's cancer journey: A literature review. *Cancer Nurs*, 17(1), 1-17.
- Lee, S. W., Lee, E. O., Huh, D. S., Noh, K. H., Kim, H. S., Kim, S. R., Kim, S. Z., Kim, J. H., Lee, K. O., Lee, E. H., Chung, E. Z., Cho, M. S., Cho, M. S., Whang, M. A., & Yun, Y. H. (1998). The study on the medical and nursing service needs of the terminal cancer patients and their caregivers. *J Korean Acad Nurs*, 28(4), 958-969.
- Lindsey, A. M., Piper, B., & Stotts, N. (1982). The phenomenon of the cancer cachexia: A review. *Oncol Nurs Forum*, 9, 38-42.
- Lobchuck, M. M., Kristjanson, L. J., Degner, L. F., Blood, P., & Sloan, J. A. (1997). Perceptions of symptom distress in lung cancer patients: I. congruence between patients and primary family caregivers. *J Pain Sympmt Manage*, 14(3), 136-146.
- McCloskey, J. C., & Bulechek, G. M. (2000). *Nursing interventions classification (NIC)*(3rd Ed.). Mosby: St. Louis.
- Molassiotis, A., & Chan, C. W. H. (2001). Fatigue patterns in Chinese patients receiving chemotherapy. *Eur J Oncol Nurs*, 5(1), 60-67.
- NANDA. (2001). *Nursing diagnosis: Definition & classification 2001-2002*. Philadelphia: Author.
- Sela, R. A., Watanabe, S., & Nekolaichuk, C. L. (2005). Sleep disturbances in palliative cancer patients attending a pain and symptom control clinic. *Palliat Support Care*, 3(1), 23-31.
- Sitzia, J., Hughes, J., & Sobrido, L. (1995). A study of patients' experiences of side effects associated with chemotherapy: Pilot stage report. *Int J Nurs Stud*, 32(6), 580-600.
- Soh, H. S., Park, O. J., & Lee, E. S. (1999). Assessment of nutritional status in chest and pelvic cancer patients undergoing radiation therapy. *Chonnam J Nurs Sci*, 4(1), 207-220.
- Steginga, S., Occhipinti, S., Wilson, K., & Dunn, J. (1998). Domains of distress: The experience of breast cancer in Australia. *Oncol Nurs Forum*, 25(6), 1063-1070.
- Stone, P., Richardson, A., Ream, E., Smith, A. G., Kerr, D. J., & Kearney, N. (2000). Cancer-related fatigue: Inevitable, unimportant and untreatable? Results of a multi-centre patient survey. *Ann Oncol*, 11(8), 971-975.
- Tishelman, C., Degner, L. F., & Mueller, B. (2000). Measuring symptom distress in patients with lung cancer: A pilot study of experienced intensity and importance of symptoms. *Cancer Nurs*, 23(2), 82-90.
- Yang, Y. H. (2002). The relationship of symptoms of side effects, fatigue and quality of life in stomach cancer patients receiving chemotherapy. *J Korean Acad Soc Adul Nurs*, 14(2), 205-212.
- Yang, Y. H., Kwon, S. J., & Kim, C. I. (2001). The nutritional status of the patients with cancer during the chemotherapies. *J Korean Acad Nurs*, 31(6), 978-987.
- Yoo, J. S., Ko, I. S., Sohn, J. O., & Park, J. W. (1997). Validation of clinical applications of nursing diagnosis for developing a nursing information system. *J Nurs Quier*, 6(1), 135-153.

암 간호정보체계 개발: 한국 6대 암 환자의 핵심간호진단

이병숙¹⁾ · Brenda K. Zierler²⁾

1) 계명대학교 간호대학 교수, 2) 위싱턴대학교 간호대학 부교수

연구목적: 본 연구는 암 간호정보체계에 사용될 한국 6대 암 환자의 핵심간호진단을 결정하기 위해 수행되었다. 핵심간호진단은 6대 암, 각 환자 군의 간호를 위해 가장 자주 혹은 많이 사용되는 일정의 간호진단 세트로 정의된다. 본 연구에서 6대 암 환자의 핵심간호진단을 결정하고자 하는 가장 큰 목적은 간호진단 과정에서의 편리성을 높임으로써 앞으로 개발될 암 간호정보체계의 유용성과 사용가능성을 높이기 위함이다. **연구방법:** 핵심간호진단은 조사연구를 통해 결정하였으며, 결정된 진단들은 문헌고찰과 환자기록 분석을 통해 그 타당도를 확인하였다. 환자기록 분석은 특히 조사연구 결과의 타당도를 확인하기 위해 사용되었다. 조사연구에 사용된 도구 및 환자기록에 나타난 간호진단 혹은 간호문제의 교차분석을 위해서는 NANDA Taxonomy II에 포함된 간호진단이 사용되었다. 219명의 경력간호사가 조사연구에 참여하였으며, 72개의 환자기록이 분석되었다. 핵심간호진단은 암 간호정보체계의 언어개발을 위해 구성된 전문가 집단에 의해 조사연구 참여자의 20% 이상이 선택한 NANDA 간호진단으로 정하였다. **연구결과:** 16개 ~ 20개의 NANDA 간호진단이 한국 6대 암, 각 환자군의 핵심간호진단으로 선정되었다. 핵심간호진단 중 ‘급성통증’, ‘만성통증’, ‘불안’, ‘감염가능성’, ‘피로’, 등이 6대 암 환자 군에 모두 포함되었다. 결론: 핵심간호진단의 타당도는 환자기록 분석과 문헌고찰을 통해 확인되었다. 이들 핵심진단은 암 간호정보체계에 사용되어 간호진단 적용을 촉진함으로써 암 환자 간호의 질 향상에 기여할 수 있을 것이다.

주요어 : 간호진단, 정보체계

• Address reprint requests to : Lee, Byoungsook
 College of Nursing, Keimyung University
 194, Dongsandong, Jung-gu, Daegu 700-712, Korea
 Tel: 82-53-250-7880 C.P.: 82-16-585-6013 Fax: 82-53-252-6614 E-mail: lbs@kmu.ac.kr