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Validation of nursing-sensitive knowledge and self-management outcomes for adults with cardiovascular diseases and diabetes

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VALIDATION OF NURSING-SENSITIVE KNOWLEDGE AND SELF-MANAGEMENT OUTCOMES FOR ADULTS WITH CARDIOVASCULAR DISEASES AND DIABETES

by

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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To my family,

My Father (오백영), Mother (강희숙), Husband (김장웅), Son (Daniel 태은),

Brother (오세근), and Sister-in-Law (이인숙),

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ABSTRACT

Cardiovascular diseases (CVD) and diabetes are the most significant chronic diseases globally due to their high prevalence and mortality. People with CVD or diabetes need to know how to self-manage their health conditions in order to promote, maintain, and restore their health status. The Nursing Outcomes Classification (NOC) has assisted nurses and other health care providers to evaluate and quantify the status of the patients and reflect on the current health care issue to prevent the progression of chronic diseases. Based on this current health focus, additional knowledge and self-management NOC outcomes were developed and added to the latest edition of NOC, published in 2013. Generally, validation of measurement tools is required to provide trustworthy evidence for use in practice. As measurement tools, NOC outcomes with their definitions, indicators, and measurement scales need to be validated for accuracy, meaningfulness, and usefulness before they are widely used in a variety of health care settings. The purpose of this study was to validate 12 NOC outcomes focused on knowledge and self-management for people with CVD and diabetes.

A descriptive exploratory design was used to validate the selected NOC outcomes, and a two-round survey using the Delphi technique was used to collect data from the invited experts via email. Two groups of nurse experts were invited. The first group were experts in standardized nursing languages (SNL) and were members of NANDA International or a fellow of the Center for Nursing Classification and Clinical Effectiveness (CNC) at the University of Iowa. The second group of experts were members of two research interest groups which are *Health Promoting Behaviors Across the Lifespan* and *Self Care* in the Midwest Nursing Research Society (MNRS) related to

self-management. Descriptive statistics were used to determine the definition adequacy, clinical usefulness of measurement scales, and similarity between content of knowledge and self-management outcomes. The Outcome Content Validity (OCV) method was used for the content validity of outcomes and their indicators.

A total of 46 and 27 nurse experts participated in the first and second round surveys, respectively. The mean age of participants was 51.87 years (SD=13.03) and the mean years of experience in nursing was 27.67 (SD=14.75) years. Most participants had experience using SNL (82.6%). Each outcome reported acceptable psychometric properties. The range of means of definition adequacy of the 12 NOC outcomes was from 3.71 to 4.29 (score range: 1.0−5.0). The range of clinical usefulness for using measurement scales was from 3.77 to 4.29. The range of content similarity of the six pairs was from 3.88 to 4.35. Every evaluated NOC outcome was identified as critical with over .80 OCV scores (perfect score 1.0). More than 80% of the indicators were categorized in the critical level in the first round. Thus, psychometric properties of the 12 NOC outcomes were acceptable for use in the clinical settings.

By using validated NOC outcomes, nurses caring of patients with CVD or diabetes can evaluate patient outcomes effectively, and determine the effect of nursing interventions accurately. Development of new NOC outcomes and validation of them will provide nurses with measurement tools to use with patients, clinical evidence for quality improvement and knowledge development in nursing.

PUBLIC ABSTRACT

Current health environments have widely adopted electronic health records. Nurses also use these systems for nursing documentation. To use these systems, development of standardized nursing languages was required, and one of those nursing languages is the Nursing Outcomes Classification (NOC). NOC outcomes measures reflect current health care issues, and new NOC outcomes have been developed. With the health care reform, current health care focuses on health promotion to prevent the development of chronic diseases. Specifically, cardiovascular diseases (CVD) and diabetes are the most significant chronic diseases due to their high prevalence and mortality. People with both diseases have to know how to self-manage their health conditions to promote, maintain, and restore their health. In order to evaluate health outcomes of the people with both diseases, new NOC outcomes focused on self-management for people with CVD or diabetes were developed. The purpose of this study was to validate 12 new knowledge and self-management outcomes for people with CVD or diabetes.

Nurse experts validated these NOC outcomes using an online survey twice. A total of 46 and 27 nurse experts participated in the first and second round surveys, respectively. The 12 NOC outcome definitions were evaluated as quite adequate to describe the outcomes. The 12 NOC outcomes were identified as critical, and more than 80% of their indicators were categorized as critical to measuring the outcome. The measurement scales for the outcomes were evaluated as quite relevant for use as scales in clinical settings. Additionally, indicators in the knowledge and self-management outcomes describing the same diseases or conditions were similar to each other to

evaluate the patient outcomes. By using validated NOC outcomes, nurses who take care of patients with CVD or diabetes can evaluate patient outcomes effectively and determine the effect of nursing interventions accurately.

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CHAPTER I

INTRODUCTION

Historically, the role of nurses has focused on providing direct patient care in a hospital setting. With recent transformations of the health care system and health policy modifications in the United States (U.S.), nurses are focused on improving the quality of nursing care, enhancing patient safety, and reducing the cost of care. Particularly, nurses have experienced a rapid shift to providing care in the community or in the home rather than in the hospital (Cowen & Moorhead, 2011). In addition, the meaning of a patient has changed from patients with diseases to customers and their family members, so that nurses meet various needs and care issues of patients and their families. To provide appropriate care in the current health care environment, nurses need to continue to adapt to the wishes and desires of the patients and families (Cowen & Moorhead, 2011). Today, patient- and family-centered care is an important theme in health care reform (Mueller, 2010).

In order to provide relevant nursing care services to patients, assessment of patient conditions and evaluation of patient outcomes are important steps in the nursing process. Depending on the results of evaluating the patient needs, nurses can identify key nursing diagnoses and implement appropriate nursing interventions to impact patient outcomes. Measuring patient outcomes accurately is essential work to evaluate both patient health outcomes and the efficacy of nursing practice. These evaluations can contribute to the development and refinement of nursing knowledge and lead to quality improvement and accurate evaluation of nursing costs (Moorhead, Johnson, Maas, & Swanson, 2013; Welton, 2010).

With the expansion and adoption of electronic health records (EHR) due to the health care system reform, nursing computerized information systems (CIS) have also developed. The use of standardized nursing languages (SNL) such as nursing diagnoses by NANDA International (NANDA-I), patient outcomes from the Nursing Outcomes Classification (NOC), and nursing interventions from the Nursing Interventions Classification (NIC) is required for the effective utilization of CIS (Lunney, 2006; Maas, Scherb, & Head, 2012). When applying SNL to CIS, nurses can communicate clearly and share information effectively across multiple settings by using the same definitions and labels from the languages. It has been documented that the use of SNL has contributed to reducing medical errors, improving quality of care, increasing patient and staff safety, and promoting efficiency, effectiveness, and increasing productivity (Butcher & Johnson, 2012; Lunney, 2006). Moreover, nursing data can be electronically retrieved and evaluated in order to develop evidence-based nursing knowledge and improve the quality of care. Additionally, nurses can deliver health care services in a timely manner and cover nursing workforce shortages through the efficient use of CIS with SNL that support nursing practice (Butcher & Johnson, 2012). SNL have been steadily developed and refined to provide these benefits since the late 1970s (Johnson et al., 2012; Maas, 2011; Muller-Staub, Needham, Odenbreit, Lavin, & van Achterberg, 2007).

Specifically, NOC outcomes are used to evaluate patient status and the effects of nursing interventions over time and across care settings. As a standardized measurement tool, NOC outcomes provide a standardized language for the outcome identification and evaluation steps to implement the nursing process. With the utilization of CIS, the development and adoption of NOC outcomes have gradually increased in order to

measure accurate patient, caregiver, family, and community outcomes, and evaluate effects of nursing care across the care continuum. The ability to measure patient outcomes across care settings is critical to meet the challenges of moving information from hospitals to other health care settings (Moorhead et al., 2013). The 5th edition of NOC published in 2013 has 490 outcomes including 107 new outcomes to use across settings and specialties. Among these new NOC outcomes, there are some related to health promotion for adults with chronic diseases. Development of these NOC outcomes reflects the current health focus on preventive care. To provide clinical evidence to users, validation of these NOC outcomes is required.

This study validated 12 NOC outcomes focused on knowledge and self-management outcomes for adults with cardiovascular diseases (CVD) and diabetes in the 5th edition of NOC. This study describes the 1) adequacy of outcome definitions, 2) content validity of the outcomes and indicators, 3) clinical usefulness of measurement scales, and 4) content similarity of pairs of the knowledge and self-management outcomes describing the same disease or condition.

Background and Significance

The nurse is a key provider in health care organizations. One of the most important roles of nurses is the delivery of appropriate nursing care, based on clinical judgments to improve patient health outcomes in every care setting. Identifying patient outcomes responsive to nursing care is critical work focused on cost, safety, effectiveness of care, and health care quality (Moorhead et al., 2013). The need for nurses to describe and measure practice outcomes, and evaluate the efficacy of nursing practice have led to

the creation and development of SNL. There is an extensive body of literature documenting the development of SNL in nursing. Efforts to develop nursing diagnoses began in 1975 by NANDA-I and have been published for over 40 years. The first edition of NIC was published in 1992 by the Iowa Intervention team, and it is in its sixth edition. NOC work started in 1989 by the Iowa Outcomes team, and has been expanded and refined over the last 20 years (Dochterman & Jones, 2003; Maas, 2011; Moorhead et al., 2013).

The NOC is a classification system of nursing-sensitive patient outcomes that assists nurses and other health care providers to evaluate and quantify the status of the patient, caregiver, family, or community (Moorhead et al., 2013). The 5th edition of NOC published in 2013 contains 490 outcomes with definitions, indicators, and measurement scales. A 5-point Likert scale is used with all outcomes and their indicators. Nursing outcome indicators describe the patient status, behaviors, reactions, perceptions, and feelings in response to delivered care by health care providers (Moorhead et al., 2013). By measuring the outcome prior to intervention, the nurse establishes a baseline score on the selected outcome and then can re-evaluate it after the intervention is provided. It is easy and convenient for nurses to identify changes in the patients' status through different scores over time and across settings. Thus, the use of NOC outcomes allows nurses to monitor improvement, deterioration, or stagnation in patient status during a care period (Moorhead et al., 2013).

The 5th edition of NOC contains 107 new outcomes including 23 new knowledge outcomes. A new class in the taxonomy representing the 16 new outcomes focused on self-management for acute and chronic diseases also was included. These new knowledge

and self-management outcomes are developed based on the current focus on health and patient involvement in the care process (Moorhead et al., 2013). This focus is critical because it is based on changes in the U.S. health care system. According to the national program, the Patient Protection and Affordable Care Act, the focus of health has moved from acute care to primary care, and the importance of preventive care has increased in order to prevent the progression of chronic diseases and to reduce medical costs for patients with chronic diseases (Mueller, 2010). These NOC outcomes can be clinically used by nurses and other health care providers taking care of patients with chronic diseases to support their behavior changes by learning about self-management.

To create these new NOC outcomes with their indicators, literature related to health knowledge and self-management for chronic diseases was reviewed by the NOC research team. According to the literature, chronic diseases are one of the most significant health care problems in the world, and the main chronic diseases are CVDs, cancer, chronic respiratory diseases (e.g. asthma and chronic obstructive pulmonary disease), and diabetes (Lubkin & Larsen, 2006). The total number of people dying from chronic diseases is over 60% of all deaths each year. Nearly 92% of older adults have at least one chronic condition, and 77% have at least two. In the U.S., 75% of the money for health care is spent treating chronic diseases. In 2009, health care expenditures for chronic conditions cost over $262 billion (National Council on Aging, 2012). Particularly, CVDs are responsible for the largest proportion of deaths globally. An estimated 17.5 million people died from CVDs in 2012, representing 30% of all global deaths (World Health Organization, 2013a). Approximately 347 million people suffer from diabetes in the world (World Health Organization, 2013b) and World Health

Organization (WHO) projects that diabetes will be the 7th leading cause of all global deaths in 2030 (WHO, 2013b). Patients with multiple chronic diseases must learn about their diseases, follow complex treatment regimens, monitor their conditions, make lifestyle changes, and make decisions for handling their health problems as they arise (Hibbard, Mahoney, Stockard, & Tusler, 2005). As key health providers, nurses and nurse practitioners must support patients with chronic diseases, teach them how to self-manage their health conditions, and provide nursing interventions to modify health behaviors to improve patient outcomes in every health setting.

Self-management is a common term in health education which focuses on assisting patients to change behaviors, improve health status, and control health care utilization (Lorig & Holman, 2003). Several health behavior change theories and models suggest that behaviors related to self-management are affected by numerous factors such as social support, motivation, environmental obstacles, self-efficacy, health beliefs, and emotional adjustment to the diagnosis (Elder, Ayala, & Harris, 1999). However, there is no doubt that patients' knowledge is one of the most important factors affecting behavior change (Elder et al., 1999; Lorig & Holman, 2003; Pearson, Mattke, Shaw, Ridgely, & Wiseman, 2007). Based on the literature review, the knowledge and self-management outcomes contain information needed by patients to understand their chronic conditions and identify needed behavior changes to improve their health and prevent advanced disease states (Moorhead et al., 2013). These NOC outcomes can help nurses choose and provide nursing interventions from NIC related to health behavior changes such as *Teaching: Individual, Teaching: Group, Teaching: Disease Process, Behavior Modification,* and *Counseling.* By measuring patient outcomes using these NOC

outcomes, nurses can evaluate baselines and changes in levels of patient knowledge and self-management over time and across settings. Moreover, nurses can evaluate the efficacy and effects of provided nursing interventions.

Generally, validation of a new measurement tool is required to provide trustworthy evidence (Burns & Grove, 2009). Since NOC outcomes are used as a measurement tool, validation of these new outcome is required before they are widely used in various health settings in order to gain advanced knowledge, clinical usefulness, and linguistic accuracy (Johnson et al., 2012). To address this issue, many studies have reported content validity, consensus validity, sensitivity, and reliability of NOC, or identified relevant outcomes for specific nursing diagnoses around the world. These validated nursing outcomes were for specific populations: patients with chronic heart failure, chronic conditions, and spinal cord injuries, or specific health settings: community, home care, and surgical units (da Silva et al., 2011; Head et al., 2004; Head, Maas, & Johnson, 2003; Keenan, Stocker, Barkauskas, Johnson, et al., 2003; Morilla-Herrera, Morales-Asencio, Fernandez-Gallego, Cobos, & Romero, 2011; Ralph et al., 2003; Seganfredo & Almeida Mde, 2011). The validation studies provided critical information for users of NOC to evaluate patient outcomes and to determine the effects of nursing interventions accurately. Likewise, there are various validation studies for NANDA-I diagnoses and NIC interventions (Chaves, de Barros, & Marini, 2010; de Abreu Almeida, Pergher, & do Canto, 2010; Paganin & Rabelo, 2012; Speksnijder, Mank, & van Achterberg, 2011; Suriano, Michel, Zeitoun, Herdman, & de Barros, 2011). These studies also reported clinical evidence of acceptable validities about selected nursing diagnoses and nursing interventions.

There has been an international emphasis on validation of the outcomes across cultures. Nurses have precisely assessed and diagnosed patients using nursing diagnoses with the validated defining characteristics, and they have also effectively applied appropriate nursing interventions with the validated activities to relevant patients. The results of these studies provided clinical evidence for effective nursing care plans, and led to knowledge development, advanced evidence-based practice, and quality improvement of nursing care in a global context.

Although some NOC outcomes were validated in previous research (Moorhead, Johnson, & Maas, 2004), the new NOC outcomes focused on knowledge and self-management for chronic diseases in the 5th edition have not been validated. In order to provide clinical evidence for effective nursing practice such as accurate assessment and evaluation, validation of these new outcomes with their definitions, indicators, and measurement scales is required (Moorhead et al., 2004). For the acceptable validity, the new NOC outcomes should have relevant definitions, indicators, and measurement scales to evaluate patient outcomes appropriately. Various users such as nurses, nursing students, other disciplines, and the public can use the NOC outcomes to evaluate health outcomes regardless of their experiences in the use of SNL. Therefore, outcome definitions should be adequate to capture the essence of the outcomes, and possess a clarity of meaning for users to understand the outcomes. The outcome should also contain critical and supportive indicators which are not vague to reduce redundancy. When developing a measurement tool, there are no specific rules about the number of items. Likewise, there are no standard rules about the number of indicators for the outcome. However, measuring with a shorter list of items is effective because it is one of the best ways to

minimize response biases caused by boredom or fatigue (Hinkin, Tracey, & Enz, 1997). Thus, a shorter list of indicators would greatly enhance the implementation of measuring patient outcomes and would make outcome evaluation much less burdensome. Nurses can spend less time on measuring indicators for evaluations and more time on caring patients for interventions. Moreover, the measurement scales of the outcomes should be useful in various clinical settings. As mentioned above, the NOC outcomes can be used by various users to evaluate patient symptoms, knowledge, perceptions, behaviors, or experiences. To measure these various concepts relevantly, the measurement scales of the outcomes should reflect the features of patient outcomes.

In this study, 12 new NOC outcomes focused on knowledge and self-management for diabetes and CVDs were validated. The results of this validation study provide clinical evidence and nursing knowledge about the NOC outcomes for nurses and other health care providers taking care of patients with diabetes and CVDs to make accurate clinical judgments, obtain standardized patient outcomes, and determine effects of their interventions. Nurses and other disciplines can communicate and share standardized patient information with one another without misunderstanding. This cooperation would lead to quality improvement and patient outcome enhancement. In addition, the results of this study contribute to quality improvement of nursing documentation.

Problem Statement and Purpose of the Study

For the meaningful use of EHR, SNL has been continuously developed and refined. Validation of SNL is clinically emphasized in various settings and with specific populations for accuracy, meaningfulness, and usefulness (Johnson et al., 2012). Many nurse researchers recognize the importance of the validation, so they have studied the validity and reliability of SNL focused on specific populations. The findings of previous validation studies provide clinical evidence for effective nursing practice, and contribute to development of nursing knowledge, support evidence-based practice, and improve quality of care across settings (Moorhead et al., 2004).

With the current focus of health care on preventing the development of chronic diseases and controlling exacerbations, development of new knowledge and self-management outcomes for chronic diseases was needed to meeting these challenges. As a measurement tool, validation of these new outcomes is required to provide nurses with clinical accuracy and usefulness for the use of these NOC outcomes in various settings. In this study, 12 NOC outcomes focused on knowledge and self-management for CVDs and diabetes were validated. The reasons of selection of the outcomes for CVDs and diabetes were that the prevalence and mortality of CVDs and diabetes have gradually increased, and these two chronic diseases have a pathologically strong relationship to each other (Jurado et al., 2009). Additionally, patients with these two chronic diseases should self-manage their health conditions in their daily lives by learning self-management skills (Ryan & Sawin, 2009).

The purpose of this study was to validate the 12 selected knowledge and self-management NOC outcomes with their definitions, indicators, measurement scales, and

content (Table 1). The 12 outcomes selected from the 5th edition are strongly related to the two chronic diseases: CVDs and diabetes. These outcomes are in the *Health Knowledge and Behavior Domain* of the NOC taxonomy. The knowledge outcomes are listed under the *Health Knowledge Class* defined as "outcomes that describe an individual's understanding in applying information to promote, maintain, and restore health" (Moorhead et al., 2013, p.60). Also, the self-management outcomes are in the *Health Management Class*, which is new in the 5th edition, defined as "outcomes that describe an individual's actions to manage an acute or chronic condition" (Moorhead et al., 2013, p.59).

Table 1. Twelve NOC Outcomes for Validation

Domain	Class	Outcome Label
Health Knowledge and Behavior	Health Knowledge	Knowledge: Cardiac Disease Management
		Knowledge: Chronic Disease Management
		Knowledge: Coronary Artery Disease Management
		Knowledge: Diabetes Management
		Knowledge: Hypertension Management
		Knowledge: Lipid Disorder Management
	Health Management	Self-Management: Cardiac Disease
		Self-Management: Chronic Disease
		Self-Management: Coronary Artery Disease
		Self-Management: Diabetes
		Self-Management: Hypertension
		Self-Management: Lipid Disorder

Specific aims of the research were:

Aim 1. Evaluate adequacy of each definition of the selected outcomes.

Aim 2. Evaluate importance of the outcome and its indicators to establish content validity

Aim 3. Evaluate clinical usefulness of measurement scales of the selected outcomes.

Aim 4. Evaluate content similarity in the pair of the two knowledge and self-management outcomes describing the same disease or condition.

Aim 5. Obtain suggestions or comments about definitions, indicators, and measurement scales from the respondents.

The following conceptual framework section describes how this validation study contributes to knowledge development and quality improvement in nursing practice. This research focuses primarily on outcomes but is supported by this well-established model used in the development of classifications for nursing practice. The model supports the nurse's clinical decision-making for identifying nursing diagnoses (patient problems), selecting nursing outcomes for particular problems, and choosing nursing interventions needed to achieve the desired outcomes. In this study, the conceptual model for development of nursing terminology modified from Iowa Intervention Project (McCloskey & Bulechek, 1996) was used. Figure 1 depicts the important components of this model.

Conceptual Framework

Early in the development of the NIC interventions, this conceptual model was developed to guide the development of nursing terminology (Figure 1). Over the past 2 decades, this model has supported the refinement of terms focused on diagnoses that nurses treat, the patient outcomes of care, and the interventions that nurses provide to reach the desired outcomes.

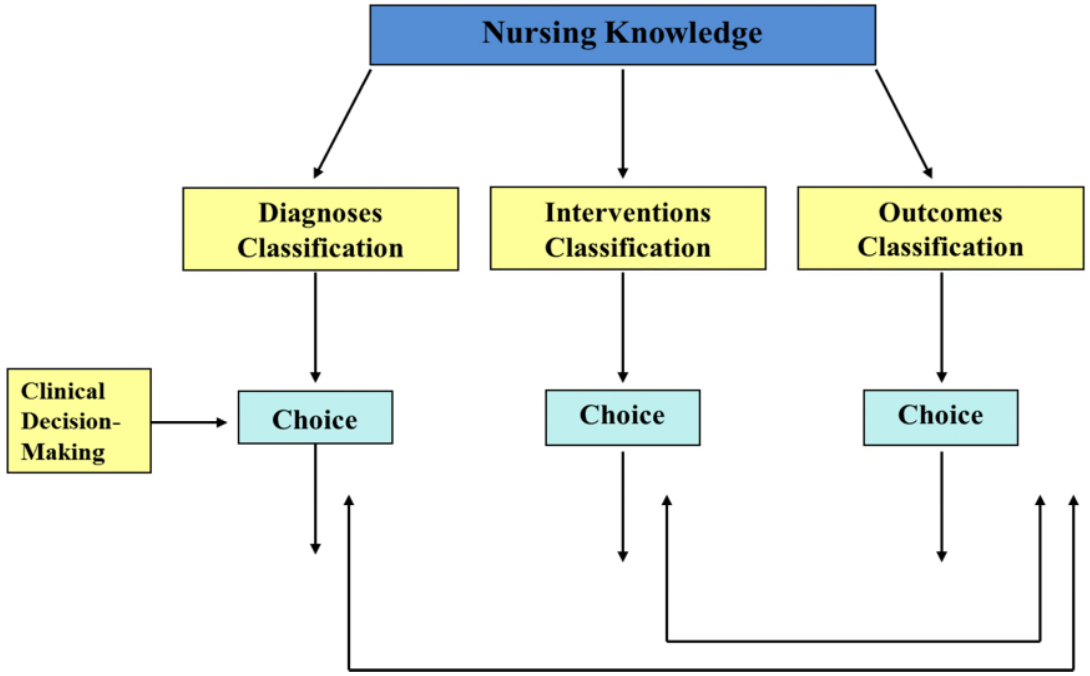


Figure 1.Relationship of nursing knowledge classifications to the nurse's clinical decision making (1996, p. 6.)

One point to emphasize in this model is that it serves to improve the clinical decision making skills of nurses through the use of nursing classifications. As components of nursing knowledge, these three nursing classifications are used for the nursing process. Since the nursing process was developed, the five-step format of the nursing process has been widely used: assessment, diagnoses, planning, intervention, and evaluation. However, the American Nurses Association recommended the six-step nursing process as the standard of care (American Nurses Association, 1991). The six-step nursing process contains "outcome identification" between diagnosis and planning procedures. With the six-step nursing process, nurses can collect patient data for assessment; determine NANDA-I diagnoses by analyzing assessed data in the diagnostic

phase; choose expected nursing-sensitive patient NOC outcomes with indicators in the third phase; develop a plan of care to attain expected outcomes by selecting NIC interventions and activities; implement selected NIC interventions and activities; and determine the changes in selected NOC outcomes and indicators during evaluation.

As a clinical decision-method, this six-step nursing process with the three nursing classifications has been usefully applied by nurses in clinical settings. Validation of the nursing classifications provides clinical evidence and nursing knowledge about linguistic accuracy, acceptable validities, and credible reliability of the nursing languages to nurses. Based on the evidence and knowledge, nurses can more clearly understand and apply the nursing classifications to the nursing process, and improve their clinical decision making skills. Eventually, nurses with advanced clinical decision making skills can facilitate achieving optimal outcomes for patients by implementing accurate nursing diagnoses and interventions. Also, using these skills will contribute to quality improvement (Butcher & Johnson, 2012; Kautz, Kuiper, Pesut, & Williams, 2006; Lunney, 2006; Pesut & Herman, 1999; Smith & Craft-Rosenberg, 2010).

The other point of emphasis is to build the knowledge base of nursing through the development of the three terminologies. Medicine has used standardized databases to routinely collect massive amounts of computerized clinical data. This data collection has enabled medicine to explore outcomes as a function of medical interventions. However, nursing knowledge about the effectiveness of nursing care is limited, and standardized terminologies are needed to establish large databases (Bulechek, Butcher, Dochterman, & Wagner, 2013; Keenan, Stocker, Barkauskas, Treder, & Heath, 2003; Moorhead et al., 2013). With the expansion and adoption of EHR, nursing data built with these three

classifications can be more readily stored, captured, and retrieved from the database. Retrieved nursing data can be evaluated for the effectiveness of nursing care with costs and then, evidence from data analyses will help nurses provide advanced nursing care to reach desirable patient outcomes. The nursing classifications should be continuously developed to establish large nursing databases, and updated to cover the latest health issues. New nursing classifications need to be validated to provide clinical accuracy and usefulness to nurses.

Creation of new NOC outcomes has contributed to knowledge development and quality improvement for clinical practice. Validation of the new outcomes will lead to accurate and meaningful evaluation of patient outcomes and delivered nursing care. Nurses can improve their clinical reasoning skills by using validated knowledge and self-management outcomes when identifying nursing diagnoses and implementing nursing interventions to patients with chronic diseases in order to obtain the desired outcomes.

Definitions

NOC outcome: "an individual, family, or community state, behavior, or perception that is measured along a continuum in response to a nursing intervention. Each outcome has an associated group of indicators that are used to determine patient status in relation to the outcome" (Moorhead et al., 2013, p.ix).

Outcome indicator: Indicators of nursing-sensitive patient outcomes are defined as "a more concrete individual, family, or community state, behavior, or perception that serves as a cue for measuring an outcome. Nursing-sensitive patient outcome indicators

characterize a patient, family, or community stat at the concrete level (Moorhead et al., 2013, p.ix)."

Self-management is defined as learning and practicing the skills necessary to carry on an active and emotionally satisfying life in the face of a chronic condition (Lorig & Holman, 2003), and self-management consists of three aspects: goal setting, action, and monitoring (Lorig & Holman, 2003; Pearson et al., 2007; Schilling, Grey, & Knafl, 2002).

Self-Management outcomes, in the health management class, are the measurement tool to evaluate patient behaviors on how to self-manage their acute or chronic conditions by setting goals, collaborating with health care providers, using knowledge and skills, and self-monitoring their conditions in daily lives.

Knowledge is defined as information, understanding, or skills that people get from experience or education: or awareness of something (Merriam-Webster Dictionary, N.D.).

Knowledge outcomes, in the health knowledge class, are the measurement tool to evaluate the level of health information patients have to self-manage their conditions in daily lives.

In this study, variables for validation of the selected NOC outcomes were operationally defined and measured as following:

Definition adequacy: an outcome definition is adequate to capture the essence of the outcome.

Content validity: a degree of importance of the outcomes and its indicators.

Clinical usefulness: a degree of the relevance of use of the measurement scales to measure the outcome in clinical settings.

Content similarity: a degree of similarity between the indicators of knowledge and self-management outcomes describing the same disease or condition.

In this study, these four variables were operationally defined as scores measured by the questionnaire developed by the investigator. More specific explanations are given in Chapter III.

Summary

Assessing patient conditions and identifying patient outcomes are important work to evaluate both patient health status and the effects of nursing interventions. Results of these evaluations will lead to quality improvement and nursing knowledge development. For the standardized nursing care plan, SNL such as NANDA-I diagnoses, NIC interventions, and NOC outcomes have been developed. Benefits of the use of these SNL have been reported. A current health care focuses on preventive care in order to prevent development of chronic diseases. Specifically, CVDs and diabetes are the most significant chronic diseases due to their prevalence and mortality. Patients with both diseases have to know how to self-manage their health conditions to prevent development of their chronic conditions. NOC outcomes have reflected the current health care issues, and have been provided to evaluate specific patient outcomes. Recently, some knowledge outcomes were added and self-management outcomes were created to support people

with chronic diseases. As measurement tools, new NOC outcomes need to be validated for accuracy, meaningfulness, and usefulness. The purpose of this study was to validate 12 NOC outcomes focused on knowledge and self-management for adults with CVDs and diabetes. Specific aims were: 1) evaluate adequacy of outcome definitions, 2) establish content validity, 3) evaluate clinical usefulness of the measurement scales, 4) evaluate content similarity of the pair of the two outcomes describing the same disease or condition, and 5) obtain suggestions and comments to improve the selected outcomes. This study provides clinical evidence and nursing knowledge about the selected nursing outcomes to users of NOC outcomes.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter reviews the literature focused on the main concepts in this study: standardized nursing languages (SNL), Nursing Outcomes Classification (NOC), validation of SNL, and self-management for people with chronic diseases such as cardiovascular diseases (CVD) and diabetes.

Standardized Nursing Languages

Historical Background of the Development of SNL

According to Gordon and Sweeney (1979), the description of the phenomena of concern is important for the development of a clinical science. Identifying, describing, and classifying the phenomena of health problems in nursing can be the essential elements of a structure for building clinical science (Gordon & Sweeney, 1979). Nurse researchers recognized the importance of advancing nursing science. Gebbie and Lavin held the first National Conference for the Classification of Nursing Diagnoses in 1973. Since this conference, other classification systems such as the Nursing Interventions Classification (NIC) and the Nursing Outcomes Classification (NOC), and language data sets (e.g., Nursing Management Minimum Data Set) have been developed to organize and describe nursing diagnoses, nursing interventions, and nursing-sensitive patient outcomes (Dochterman & Jones, 2003).

In order to identify and describe health problems diagnosed by nurses, the North American Nursing Diagnosis Association (NANDA) was formed in 1982. NANDA

collaborated with the American Nurse Association to develop nursing diagnoses, and the first NANDA Taxonomy was published in 1987 (Dochterman & Jones, 2003). To support the efforts to classify important nursing concepts beyond the development of nursing diagnoses, the nursing intervention research team was formed at the University of Iowa College of Nursing in 1987. The classification focused on the development of nursing interventions provided by nurses across care settings and clinical specialties based on nursing practice. For nursing-sensitive patient outcomes, the nursing outcome research team was started at the University of Iowa College of Nursing in 1991 to develop the outcomes needed to measure the effectiveness of nursing interventions (Dochterman & Jones, 2003). Recently, NANDA was renamed NANDA International (NANDA-I) to depict the international use of this classification. For NIC and NOC, the Center for Nursing Classification and Clinical Effectiveness (CNC) at the University of Iowa has made efforts to develop and update both classifications consistently since their establishment.

These three SNL help nurses communicate and collaborate with health care providers in other disciplines about patient care accurately. They also support nursing documentation and decision making procedures readily in computerized information systems (CIS). By using these SNL, nursing data can be built and retrieved electronically to establish clinical evidence in the nursing field. Because of these benefits, the use of the three SNL has gradually expanded, so that the NANDA-I taxonomy 2015-2017 contains 13 domains, 47 classes, and 235 labels for nursing diagnoses (Herdman, 2014); the 6th NIC has 7 domains, 30 classes, and 554 interventions with activities for nursing care plans (Bulechek et al., 2013); and the latest NOC (5th ed.) includes 7 domains, 32 classes,

and 490 outcome labels with indicators for evaluation of patient outcomes (Moorhead et al., 2013). Additionally, some CIS which assist health care delivery have adopted and integrated these three SNL (NANDA-I, NIC, and NOC) for nursing care planning and documentation as representative elements of nursing care. The use of three nursing classifications together, referred to as NNN linkages, facilitates the use of SNL to the benefit nursing practice, education, and research. To support nurses and students in practice, NNN linkages were published in 2001, and the 3rd edition was published with more linkages for specific populations and diseases in 2012 (Johnson et al., 2012).

Nursing Outcomes Classification

During the Crimean War, Florence Nightingale recorded and analyzed health care conditions and patient outcomes, and it was the beginning of the use of patient outcomes to evaluate health care (Lang & Marek, 1990; Salive, Mayfield, & Weissman, 1990). Particularly, since Aydelotte's landmark study (1962) that used changes in behavioral and physical characteristics of patients as outcomes of nursing care to evaluate the effectiveness of nursing care delivery systems, numerous nursing studies have used patient outcomes to measure and improve the quality of nursing care, to evaluate the effects of nursing interventions, and to reduce costs (Huston, 1999; Ireson & Grier, 1998; Irvine, Sidani, & Hall, 1998; Sovie, 1989). Also, Rantz (1995) stated that identifying and measuring nursing-sensitive patient outcomes are important for policy development. As mentioned above, the 1st edition of the NANDA taxonomy was published, and the Nursing Minimum Data Set (NMDS) was introduced and developed to support nursing documentation and to manage nursing data in late 1980s (Werley & Zorn, 1987; 1989). With these developments, nurse researchers were studying how to classify patient

outcomes because of the importance of patient outcomes to nursing (Sovie, 1989), and then the Nurse Sensitive Patient Outcomes Research Team at the University of Iowa College of Nursing reviewed the literature on outcomes in order to identify and classify nurse-sensitive patient outcomes, using an inductive approach, and to validate outcome indicators with data from patients and nurse clinicians (Delaney et al., 1992).

The Iowa Outcome Research Team, formed in 1991, published the 1st edition of NOC in 1997 as a standardized language for nursing outcomes, and this edition included 6 domains, 24 classes, and 197 outcome labels with indicators (Johnson & Maas, 1997). Since the 1st edition, the nursing outcome taxonomy has been refined and expanded to include additional classes and outcomes (Table 2), and many NOC outcomes were validated to increase nurses' confidence in the measurement tools when evaluating patient outcomes by validated NOC outcomes (Head et al., 2004; Head et al., 2003; Keenan, Stocker, Barkauskas, Johnson, et al., 2003; Moorhead, Johnson, Maas, & Swanson, 2008).

Table 2. Development of the NOC Taxonomy (Moorhead et al., 2013, p.44−45)

Edition	Numbers of Domain	Numbers of Class	Numbers of Outcome
Original	6	24	197
2nd Edition	7	29	260
3rd Edition	7	31	330
4th Edition	7	31	385
5th Edition	7	32	490

The efforts to develop and update new outcomes have continued to cover specific populations, diseases, and current health issues. In the latest edition, the Health Management class was added, and additional outcome labels were added to the class

focused on Health Knowledge (Moorhead et al., 2013). Validation of the new outcomes is needed to provide nurses with clinical usefulness and accuracy as measurement tools.

Validation of SNL

The meaning of validation from the dictionary is that something is valid when it is "well-grounded or justifiable" or "relevance and meaningful," and it is "logically correct" (Merriam-Webster Dictionary, 1993). A valid nursing language is one that is well-grounded on evidence and can be used by nurses meaningfully and correctly. Historically, validation issues were raised from nurses and students using nursing diagnoses in practice since the early 1980s. When they used the nursing diagnoses, they were not confident whether the diagnoses reflect nursing phenomena in the real world, so they needed empirical evidence. For these issues, Gordon and Sweeney (1979) provided directions for validating nursing diagnoses: the retrospective identification model, the clinical model, and the nurse-validation model. However, these three types of validation methods did not provide the methodological detail for researchers, and results of these three models were hardly applicable for the complex statistical analysis in validation studies (Fehring, 1987; 1994). Thus, new validation models were developed that are now known as the Fehring models: the clinical diagnostic validity (CDV) model and the diagnostic content validation (DCV) model.

Since Fehring published the original method of validation for nursing diagnoses in 1987, many nurse researchers have used this method in their studies to validate specific NANDA diagnoses such as *Anxiety, Hopelessness,* and *Ineffective airway clearance* (Fehring, 1994, p.57). From these validation studies, several problems and

recommendations were raised and resulted in, modifications to the Fehring method to clarify the way of interpretation and expert selection were done (Fehring, 1994). After this modification, many nurse researchers have applied this method to their studies to validate NANDA diagnoses with definitions, defining characteristics, and related factors for specific populations. The results of these studies provide nurses with clinical evidence for accurate diagnostic judgments (Chaves et al., 2010; Paganin & Rabelo, 2012; Speksnijder et al., 2011; Suriano et al., 2011). The nursing intervention research team also used this method to validate nursing interventions and activities before publishing the 1st edition of NIC (Bulechek & McCloskey, 1992). NIC interventions also have been validated to provide clinical evidence for practice focused on content and consensus validity for NIC interventions and activities for specific NANDA diagnoses or populations (Bavaresco & Lucena, 2012; de Abreu Almeida et al., 2010; Lopes, Barros, & Michel, 2009; Lopes & Barros, 2003).

The DCV Model and the Outcome Content Validity Method

The DCV model was described by Fehring to validate nursing diagnoses (1987). This model was originally referred to as a methodology for developing nursing diagnoses and was first presented at the 5th Conference on the Classification of Nursing Diagnoses in St. Louis in 1984 (McLane & Fehring, 1984). This model is based on obtaining expert opinions from nurses on the degree to which each defining characteristic is indicative of a given diagnosis. The steps for the DCV model are as follows (Fehring, 1987):

1. Nurse experts rate the defining characteristics of the diagnosis being tested on a scale of 1 (not at all characteristic) to 5 (very characteristic).

2. Weighted ratios are calculated for each defining characteristics. These are obtained by summing the weights assigned to each response. The weights are as follows: 1=0; 2=0.25; 3=0.5; 4=0.75; 5=1.

3. Defining characteristics with weighted ratios greater than or equal to 0.80 will be considered as major; weighted ratios less than 0.80 but greater than 0.50 will be labeled as minor; and weighted ratios less than or equal to 0.50 as a cutoff criterion will be discarded.

4. Obtain a total DCV score by summing the individual ratio scores and dividing by the total number of defining characteristics of the tested diagnosis.

According to this method, weighted ratios greater than or equal to 0.80 are labeled as major. The rationale is that this score means the experts agree that the defining characteristics are very much indicative of the diagnosis being tested (Fehring, 1987), and reliability coefficients with the 0.80 score for measurement tools is a standard cutoff score (Polit, 2010).

However, there were doubts about the cutoff criterion of 0.50 from some validation studies that were conducted using this method (Fadden, Fehring, & Kenkel-Rossi, 1987; Metzger & Hiltunen, 1897). In order to improve results of validation, modification of the DCV model was suggested (Sparks & Lien-Gieschen, 1994). Sparks and Lien-Gieschen suggested revisions to the scoring in the DCV model, and the cutoff score of 0.60 was identified as an appropriate criterion for defining characteristic content validity. They mentioned that the number of clinically vague diagnostic cues would be limited with the cutoff score of 0.60. By limiting and identifying concise and descriptive

defining characteristics, nurses can use nursing diagnoses accurately and usefully within the areas of clinical practice, education, and research (Sparks & Lien-Gieschen, 1994). The investigators of the Iowa outcome research team agreed with Sparks and Lien-Gieschen on the importance of clinical accuracy and usefulness. For validation of NOC outcomes, the research team adopted the modified Fehring method with the expert rating system and the criterion suggested by Sparks and Lien-Gieschen. It was introduced as the Outcome Content Validity (OCV) method (Johnson & Maas, 1998).

Table 3. Fehring Validation Model Expert Rating System

Rater	Point
Master's degree in nursing	4
Master's degree in nursing with a thesis in content relevant to the diagnosis of interest	1
Published research on the given diagnoses or relevant content	2
Published article on the diagnoses in a refereed journal	2
Doctoral dissertation on diagnosis	2
Current clinical practice of at least 1 year duration in an area relevant to the diagnoses of interest	1
Certification in an area of clinical practice relevant to the diagnosis of interest	2

In order to improve validation results and to refine a methodology of this model, Fehring modified the model with the suggestion of defining the level of expertise that raters should have (Table 3), since the expertise of raters is very critical for the validation study (Fehring, 1994). Fehring recommended that experts should have a minimum of master's degree in nursing with a defined area of clinical expertise. Based on his system, the raters would need to have a minimum of 5 total points. The higher point indicates the

high levels of expertise for stronger evidence. He expected that having experts with high levels of expertise would be desirable for the DCV model because the study requires fewer raters (Fehring, 1994).

Validation of NOC

One of purposes of NOC is to evaluate patient health outcomes as a measurement tool. According to Polit, instruments should have and report acceptable validity and reliability. The meaning of validity is "the degree to which an instrument is measuring what it is supposed to be measuring" (Polit, 2010, p.217). Validation of NOC outcomes is required to provide empirical evidence, so nurses can be confident in clinical judgment for evaluation of patient outcomes with NOC outcomes. Because of the importance, many validation studies of NOC have been conducted.

At the beginning of development of NOC, several NOC outcomes were validated to provide clinical evidence of validity, reliability, sensitivity, and usefulness as a measurement tool (Head et al., 2004; Head et al., 2003; Keenan, Stocker, Barkauskas, Johnson, et al., 2003; Maas et al., 2002; Moorhead, Johnson, Maas, & Reed, 2003; Scherb, Johnson, & Maas, 1998). These studies reported that NOC outcomes had acceptable psychometric properties as a measurement tool. After publishing the 3rd edition of NOC, many studies focused on the effects of using NOC outcomes and the most frequent NOC outcomes for specific populations (Head, Scherb, Maas, et al., 2011; Head, Scherb, Reed, et al., 2011; Lunney, Parker, Fiore, Cavendish, & Pulcini, 2004; Muller-Staub et al., 2007; Park, 2010; Scherb et al., 2011), and these studies developed nursing knowledge through validation. Current NOC outcomes have been developed to cover various populations, their needs, and latest health issues. Recent validation studies

have emphasized on the linkage among NANDA-I diagnoses, NIC interventions, and NOC outcomes. Some studies validated the most important NOC outcomes for specific NANDA-I diagnoses focused on particular populations or conditions (da Silva et al., 2011; de Fátima Lucena, Holsbach, Pruinelli, Serdotte Freitas Cardoso, & Schroeder Mello, 2013; Morilla-Herrera et al., 2011; Seganfredo & Almeida Mde, 2011). These studies reported the importance of the NOC outcomes with their indicators related to the NANDA-I diagnoses using the DCV model. One of the studies developed operational definitions of outcome indicators to help nurses measure the indicators in clinical settings, and reported it contributed to accurate assessment (da Silva et al., 2011). Additionally, there were some studies to validate the linkage between NIC interventions and NOC outcomes for specific populations or conditions (Lopes et al., 2009; Lopes & Barros, 2003). These validation studies provided not only acceptable psychometric properties of NOC outcomes but also reinforced the importance and effects of using SNL in clinical settings. In the latest edition of NOC, 107 new outcomes were developed and added. As a new measurement tool, these new outcomes should be validated to provide clinical evidence and nursing knowledge to nurses.

The Delphi technique for validation

The Delphi technique has proven a popular method in validation studies to obtain the most reliable consensus of a group of experts (Okoli & Pawlowski, 2004). Lisntone and Turoff (2002, p.3) described common characteristics as following:

> Delphi may be characterised as a method for sturcting a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. From this communication process, there

> are provided: some feedback of individual contributions of information and knowledge; some assessment of the group judgment or view; some opportunity for individuals to revise views; and some degree of anonymity for the individual responses.

Burns and Grove (2009) described "the Delphi technique measures the judgments of a group of experts for the purpose of making decisions, assessing priorities, or making forecasts (p.414)." Since 1996, the Delphi technique has been used in nursing research. To implement the technique, the researcher identifies a panel of experts with inclusion and exclusion criteria. Members of panel remain anonymous, and questionnaires usually contain open-ended questions. The role of the researcher is to maintain objectivity. The results of a questionnaire is returned to the panel of experts, along with a second questionnaire. Respondents return the second round questionnaire to the researcher for analysis. This procedure is usaully repeated to obtain a consensus among the panel (Burns & Grove, 2009). One of limitations to using this technique is the panelists are anonymous. Thus, they have no accountability for their responses. Their feedback could tend to be centralized, or traditional analyses which use means and medians may mask the responses of those who are resistant to the consensus. Therefore, researchers should consider this limiation when analyzing data.

Patients with CVDs and Diabetes

Globally, chronic diseases are the leading causes of death. According to World Health Organization (WHO), a total of 56 million deaths occurred in the world during 2012 and approximately 38 million (67.8%) were as a result of chronic diseases, principally CVDs, diabetes, cancer, and chronic respiratory diseases (WHO, 2014). The WHO predicts that the importance of chronic diseases will continue to increase in the next decade as well as deaths by chronic diseases are projected to increase by 17% from 2012 to 2030 (WHO, 2014, p.4). Specifically, the leading cause of death in 2012 was CVDs (46.2% of chronic disease deaths, or 17.5 million deaths). CVDs are a group of disorders of the heart and blood vessels and they include: coronary heart disease, cerebrovascular disease, rheumatic heart disease, peripheral arterial disease, congenital heart disease, and deep vein thrombosis and pulmonary embolism (WHO, 2013a). Diabetes resulted in an additional 1.5 million deaths in 2012 (WHO, 2014). Although the proportion of deaths due to diabetes was smaller than other diseases: cancer (8.2 million) and respiratory diseases (4.0 million) (WHO, 2014), diabetes is strongly related to CVDs pathologically. Impaired glucose tolerance and impaired fasting glycemia, which are typical symptoms of diabetes, are crucial risk factors for future development of CVDs (Jurado et al., 2009). Diabetes is the leading cause of stroke and renal failure in many populations (WHO, 2014). Thus, there is no doubt that a combination of CVDs and diabetes is the primary cause and the largest proportion of chronic disease deaths in the world.

Not surprisingly, 60 to 80% of general medical costs are related to the care of persons with chronic diseases (Rapoport, Jacobs, Bell, & Klarenbach, 2004). According

to WHO, 11.2 billion US dollars annually are spent on the cost of implementing a set of high-impact interventions to reduce chronic diseases in the world (WHO, 2014). Heart disease, stroke and diabetes cause billions of dollars in losses of national income each year in the world's most populous nations. Particularly, diabetes care may account for up to 15% of national health care budgets. Each year, an estimated 100 million people are pushed into poverty because they have to pay directly for health services (WHO, 2011). Due to the significance of CVDs and diabetes, many health care providers have paid attention to caring for patients with these chronic diseases.

Health Behavior Change through Self-Management

Health care providers and researchers recognize that changing health behaviors by individuals is one of the most effective ways to prevent development of chronic diseases. The WHO (2014) found that CVDs and diabetes can be prevented through appropriate health behaviors: healthy diet, regular physical activity, avoiding tobacco use, and stress management. Individuals can reduce their risks of CVDs and diabetes by engaging in regular physical activities, avoiding tobacco use and second-hand tobacco smoke, choosing a diet rich in fruit and vegetables and avoiding foods that contain saturated fats, sugar, and salt, maintaining a healthy body weight, and avoiding the harmful use of alcohol (WHO, 2013a). Many health care providers and researchers have made efforts to develop and provide interventions that instruct patients on how to self-manage their health conditions to change health behaviors in their daily lives.

Self-management has become a popular term for behavioral interventions and health education, and the meaning of self-management is whether one is engaging in a health promoting activity such as healthy diet or is living with a chronic disease, persons

have the responsibility for day-to-day management. The issue of self-management is especially important for people with chronic diseases because of maintenance of their health conditions over the length of the illness (Lorig & Holman, 2003). Self-management has been used to refer to three different phenomena by various health care providers and researchers: namely a process, a program, or an outcome (Ryan & Sawin, 2009). The process of self-management means the use of self-regulation skills to manage chronic conditions or risk factors. The process generally contains activities such as forming partnerships with health care providers, goal setting, self-monitoring, reflective thinking and decision making, planning for and engaging in specific behaviors, self-evaluation, and management of physical, emotional, and cognitive responses associated with health behavior changes (Bodenheimer, 2003; Carver & Scheier, 1998; Creer & Holroyd, 1997; Lorig & Holman, 2003). The programs or interventions of self-management are designed by health care providers with the intent of preparing persons to assume the responsibility for managing their chronic illnesses or engaging in health promotion activities. Self-management has also been used to describe outcomes achieved by engaging in the process, such as stabilization of blood pressures in persons with CVDs or smoking cessation (Ryan & Sawin, 2009). In these three different phenomena, self-management repeatedly involves core elements: knowledge, health beliefs, self-regulation skills and abilities, self-efficacy, learning, attitudes, social facilitation, motivation, reinforcement to manage chronic conditions or engage in health behaviors (Elder et al., 1999; Pearson et al., 2007).

Traditionally, self-management programs provided patients with chronic diseases with information and knowledge about diseases, so that the term patient education is

often used interchangeably with self-management programs. Patient education as a method of providing knowledge and information has been associated with outcomes such as increased levels of knowledge, increased patient satisfaction, or change in readiness to engage in a health behavior. However, patient education is not sufficient for self-management even though knowledge is very necessary, because self-management programs facilitate development of self-management skills and activities designed to enhance health behavior change, decrease health care costs, and increase quality of life (Bodenheimer, 2003; Lorig & Holman, 2003; Pearson et al., 2007). Health care providers can provide self-management programs to patients with CVDs and diabetes in order to improve their health outcomes by using self-management processes. To accurately evaluate patient self-management outcomes and effects of self-management programs, an appropriate measurement tool is required. Specifically, a nursing-sensitive outcome evaluation tool should be developed to assist nurses in various health settings.

Development of Self-Management Outcomes

As mentioned above, the new self-management NOC outcomes were developed based on the current health issue. In 2010, Public Law 111-148, the Patient Protection and Affordable Care Act (PPACA), was enacted. The PPACA included efforts to address the triad of challenges in health policy: increased expenditures, access to care, and quality (Mueller, 2010). Especially, Titles III and IV in the PPACA focused on the quality of health care and prevention of chronic disease (Democratic Policy Committee, 2009).

Title III was *Improving the Quality and Efficiency of Health Care*, and addressed the value-based purchasing program and development of a national strategy to improve

the delivery of health care services, patient health outcomes, and population health (Mueller, 2010). The intent of this legislation was to improve the quality and efficiency of health care by accurately assessing quality of performance based on performance standards. To be evaluated the value of nursing concisely, empirical evidence of nursing care should be provided. Also, this legislation has focused on development of quality measures to assess health outcomes and functional status. Thus, appropriate measurement tools for nursing care are required.

Title IV was *Prevention of Chronic Disease and Improving Public Health*, and the intent was for health promotion and disease prevention by establishing three new agencies to support clinical preventive services, community prevention interventions, and immunization practices. These three agencies have supported health care organizations, providers, and researchers who want to develop health promotion and prevention interventions for patients with chronic diseases and the public (Democratic Policy Committee, 2009). Self-management interventions are one of effective ways to reduce risk factors and prevent development of chronic diseases across the lifespan. Therefore, evaluation of nurse-derived self-management outcomes for use in clinical settings is required to identify the effects of the interventions and to contribute to health promotion and disease prevention.

Need for Validation of the Self-Management Outcomes

Based on the needs mentioned above, the self-management outcomes for chronic diseases were developed and added in the latest edition of NOC. As a measurement tool, these new outcomes should be validated to provide clinical evidence with acceptable psychometric properties. In this study, the 12 knowledge and self-management NOC

outcomes for adults with CVDs or diabetes were validated. Knowledge is one of the most important elements for performing self-management. Thus, content of both knowledge and self-management outcomes describing the same disease or condition should be related to each other. Self-management for chronic diseases contains various aspects to prevent development of diseases. The new self-management outcomes should reflect the complexity of self-management. Through validation of the NOC outcomes, clinical evidence and nursing knowledge are enhanced.

CHAPTER III

RESEARCH DESIGN, METHODS, AND DATA ANALYSIS

Research Design

A descriptive exploratory design was used to validate selected nursing-sensitive patient outcomes from the Nursing Outcomes Classification (NOC). Specifically, the knowledge and self-management outcomes for chronic diseases such as CVDs and diabetes were selected. The knowledge outcomes were measurement tools that evaluate levels of patient knowledge and information about a disease, its treatment, prevention of disease progression and complications. The self-management outcomes measured patient behaviors and effects of nursing interventions related to components of self-management such as goal setting, knowledge, skills, and confidence (Moorhead et al., 2013). Both knowledge and self-management can affect patient's problem-solving, decision-making, and ability to change patient health behaviors (Lorig & Holman, 2003). Through the validated knowledge and self-management outcomes, nurses can measure not only accurate baselines of patient knowledge and health behaviors but also results of patient status changes and nursing interventions over time and across settings.

As a preliminary step of this study, the knowledge and self-management outcomes related to CVDs and diabetes were selected for this validation study (see Table 1). The results of this step were the basis of the survey. A Delphi technique was utilized to validate the selected outcomes with their definitions, indicators, and measurement scales. For clear consensus among a sample of nurse experts about the survey, the Delphi technique was applied twice. The created electronic survey was sent to potential

respondents, and they were asked to evaluate the selected outcomes for definition adequacy, content validity, clinical usefulness, and content similarity between knowledge and self-management outcomes. Also, the respondents were asked to describe any recommendations and comments about the outcomes, definitions, indicators, and measurement scales to improve and refine the selected outcomes.

Sample

In order to obtain the most reliable consensus of a group of experts, soliciting qualified experts is one of the most important procedures in the Delphi technique. Okoli and Pawlowski (2004) introduced a relevant procedure of selecting experts for the Delphi technique, and this study followed their procedure.

Inclusion and Exclusion Criteria

According to the Okoli and Pawlowski procedure, the first step is to make categories for the necessary panels. In this study, there were two important concepts for the study purposes: NOC and self-management for CVDs or Diabetes. Thus, two panel categories were required to evaluate the definition adequacy, content validity, clinical usefulness, and content similarity of the selected NOC outcomes based on the two important concepts: 1) experts in SNL such as NANDA-I, NOC, and NIC, and 2) experts in self-management. Additionally, both panels were required to have at least a master's degree in nursing. This study used the modified Fehring method to validate NOC. According to the method, raters who have a master's degree in clinical nursing show high levels of expertise (Fehring, 1994). Detailed inclusion criteria are as follows:

Category 1. Experts in NOC who: 1) were members of the NANDA -I or fellows of the Center for Nursing Classification & Clinical Effectiveness (CNC), and 2) had at least a master's degree in nursing.

Category 2. Experts in self-management about CVDs or diabetes who: 1) were members of the two research interest sections (RIS) *Health Promoting Behaviors Across Lifespan* and *Self Care* in the Midwest Nursing Research Society (MNRS), and 2) had at least a master's degree in nursing.

Experts in self-management were recruited from these two RISs because self-management is strongly associated with chronic diseases, health behavior change, health promotion, and self-care.

Detailed exclusion criteria are as follows:

Experts in NOC or self-management who: 1) cannot speak English, and 2) lived outside the United States.

The selected NOC outcomes were in English; thus, an expert was required to understand English. The compensation process for this study was not applied to people who live outside the U.S., so they were excluded.

Expertise of Sample

In a validation study with the Delphi technique, expertise of respondents is the most important factor to obtain valuable results (Fehring, 1994; Okoli & Pawlowski, 2004). Fehring recommended using his validation model expert rating system (see Table 3) to qualify experts, and his recommended score was a minimum of 5 total points for the DCV model. Fehring's expert rating system was modified by the investigator for

validation of NOC, and then applied in this study (Table 4). The original expert rating system focused on nursing diagnoses, however, the modified expert rating system dealt with NOC outcomes and self-management for chronic diseases.

Also, the minimum point of an expert was set at 4 total points which indicated that the expert has at least a master's degree in clinical nursing. Having a master's degree in nursing was considered to have enough expertise for the use of the OCV method consistent with other NOC validation studies (Head et al., 2004; Head et al., 2003; Johnson & Maas, 1998).

Table 4. Modified Fehring Validation Model Expert Rating System

Rater	Point
Master's degree in nursing	4
Master's degree in nursing with a thesis focused on SNL or self-management for chronic diseases	1
Conducted research on SNL or self-management for chronic diseases	2
Published articles on SNL or self-management in a refereed journal	2
Doctoral dissertation on SNL or self-management for chronic diseases	2
Clinical practice of at least 1 year duration in an area relevant to CVDs or diabetes	1
Certification in an area of clinical practice relevant to CVDs or diabetes	2

Sample Size

There are no standard rules of sample size for the Delphi technique. Usually, 3 to 10 experts are recommended for a panel discussion as one group. A minimum of 5 experts would provide a sufficient level of control for chance agreement; however, a

number of 3 experts would be used in content/domain areas where it may be difficult to invite appropriate experts and to obtain their cooperation. Additionally, over 10 experts is not recommended to make a consensus among panels (Lynn, 1986). In this study, there were six panel groups for the survey (see Table 6). The range of number of panels in each group were 5 to 10 in the first round survey, and 4 to 5 in each panel group in the second round survey. The exact numbers of panels are reported in Chapter IV.

Sampling Procedure

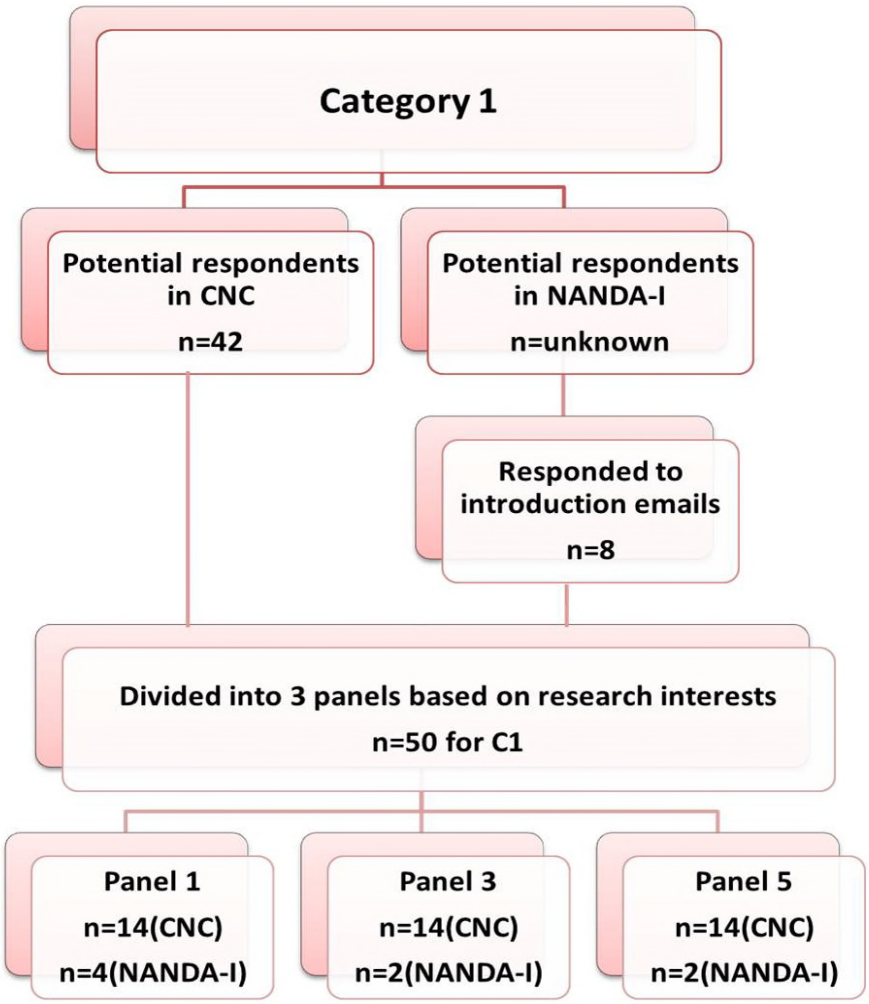


Figure 2. Sampling Procedure for Category 1

Figure 2 and 3 shows the flow of sampling procedure for category 1 (C1) and category 2 (C2). After setting the expert categories for the study, the next step was to build the invitation list. In order to create the list, the investigator contacted the offices of each professional association (NANDA-I and CNC) for C1 by email including a cover letter which introduced the purpose and significance of the study, benefits, research procedures, and contact information for cooperation. The investigator requested the two offices and chair persons to provide contact information of relevant members (name and email address). The CNC agreed and provided the list of names and email addresses of 42 fellows. NANDA-I agreed with cooperation, and asked the investigator to send the introduction email about this study to the office. The office of NANDA-I sent the introduction email to eligible members of NANDA-I rather than providing a list of membership with names and email addresses. In the case of C2, the MNRS provided member directories by RIG to MNRS members via its website. As a member of MNRS, the investigator accessed the directories and created a list of members in the two RIGs. There were 194 members from the two RIGs. The investigator checked and deleted 26 duplicated members in the two RIGs. Based on names and email addresses, the investigator searched education levels, research interests, and specialty areas of the 42 fellows in the CNC and 168 members in the MNRS. After deleting student members without degrees, the investigator built the invitation list with 42 fellows from the CNC and 138 members from the MNRS. The office of NANDA-I sent the invitation emails of this study to members of NANDA-I on March 4, 2015. The investigator received emails from 8 members who were interested in this study. Finally, there were 50 for C1, and 138 for C2. All of them were satisfied with the inclusion and exclusion criteria of this study.

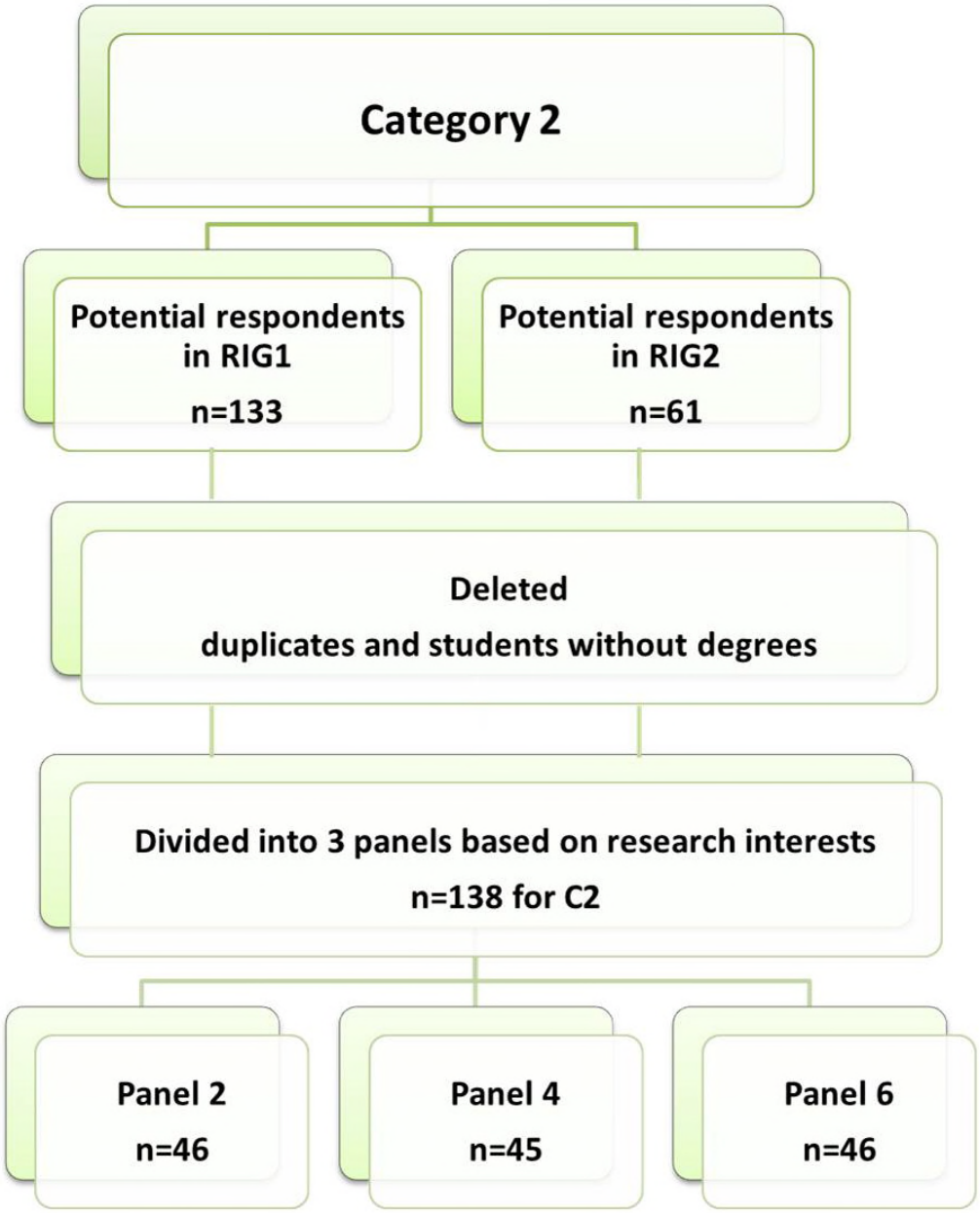


Figure 3. Sampling Procedure for Category 2

Variables and Measures

Survey Sets

In this study, the 12 NOC outcomes focused on knowledge and self-management for CVDs and diabetes were selected to be validated. These NOC outcomes were from the Health Knowledge and Health Management Classes. Most of these NOC outcomes contain an average of 37 indicators. Validation of the 12 NOC outcomes made a heavy burden to respondents, so the 12 NOC outcomes were categorized into three Survey Sets based on a relationship between diseases or conditions in order to save the time and efforts of respondents (Table 5).

Table 5. Survey Sets

	Outcomes
Set 1	Knowledge: Chronic Disease Management Self-Management: Chronic Disease Knowledge: Diabetes Management Self-Management: Diabetes
Set 2	Knowledge: Cardiac Disease Management Self-Management: Cardiac Disease Knowledge: Hypertension Management Self-Management: Hypertension
Set 3	Knowledge: Coronary Artery Disease Management Self-Management: Coronary Artery Disease Knowledge: Lipid Disorder Management Self-Management: Lipid Disorder

Potential respondents in the two categories were divided into the three Survey Sets based on their research interests or specialty areas. Finally, the six panel groups of respondents were identified (Table 6). The respondents in panel group 1 (P1) and panel group 2 (P2) received the Survey Set 1 focused on chronic disease and diabetes

management. The respondents in panel group 3 (P3) and panel group 4 (P4) received the Survey Set 2 focused on cardiac disease and hypertension management. The respondents in panel group 5 (P5) and panel group 6 (P6) received the Survey Set 3 focused on coronary artery disease and lipid disorder management.

Table 6. Panel Groups and Survey Sets

Survey Set	Category 1	Category 2
1	Panel 1	Panel 2
2	Panel 3	Panel 4
3	Panel 5	Panel 6

Variables

The variables for this study were in the second part of the questionnaires, and the variables were definition adequacy, content validity, clinical usefulness, and content similarity. The respondents also were asked to comment and make recommendations about the outcomes and the study.

Definition adequacy: the questionnaires asked the respondents to rate the adequacy of each definition for capturing the essence of the outcome. A 5-point scale was used as 1-not at all adequate; 2-slightly adequate; 3-moderately adequate; 4-quite adequate; and 5-perfectly adequate to describe each outcome. Comments were requested from the respondents for a further refinement of each definition.

Content validity: the questionnaires asked the respondents to rate the importance of indicators of each outcome for measuring the outcome. A 5-point scale was used as 1-

not at all important; 2-slightly important; 3-moderately important; 4-quite important; and 5-very important. Comments were requested from the respondents for improvement of each outcome and indicators.

Clinical usefulness: the questionnaires asked the respondents to rate the relevance of use of the measurement scale for measuring the outcome clinically. A 5-point scale was used as 1-never relevant; 2-slightly relevant; 3-moderately relevant; 4-quite relevant; and 5-very relevant to measure each indicator. Comments were requested from the respondents for a further refinement of the measurement scale.

Content similarity: the questionnaires asked the respondents to rate content similarity between the indicators of the knowledge and self-management outcomes focusing on the same disease or clinical condition for matching up the knowledge indicators with the behavior indicators from the two NOC outcomes. A 5-point scale was used as 1-not matched; 2-slightly matched; 3-partially matched; 4-mostly matched; and 5-perfectly matched. Comments were requested from the respondents for a further refinement of the indicators.

The analyzed results from the first round survey were the basis of the second round survey. The second round survey was developed with the same format of the first round. However, the second round survey contained the content validity variable, and asked for comments about the outcomes. More than half of the comments were associated with indicators, and several indicators were evaluated differently by the two expert categories in the first round survey; thus, the confirmation of the results about the importance of outcomes and indicators from the first round was required. Indicators rated

as unnecessary for this outcome in the first round were not included in the second round survey.

Questionnaires

The questionnaires for this survey were developed by the investigator using Qualtrics (Appendix A). Qualtrics is a web-based tool for creating questionnaires, conducting online surveys, collecting and saving data, provided by the University of Iowa.

The three questionnaires were conducted based on the Survey Sets. The format of the three questionnaires was the same, and each questionnaire included the four NOC outcomes according to the Survey Sets (see Table 5). The questionnaire format followed the survey method of the NOC validation study by Head (2004). Head's study adopted the outcome content validity (OCV) method for NOC outcomes (Johnson & Maas, 1998) which was modified based on the diagnostic content validation (DCV) model developed by Fehring (1994).

The questionnaires for the first round survey consisted of three parts: organization of this questionnaire, the variables about the four NOC outcomes, and general information. The beginning of this questionnaire explained the purpose of this study, the four NOC outcomes, and how to respond to this questionnaire with definitions of the variables. The variables in the first round survey were definition adequacy, content validity, clinical usefulness, and content similarity. The first round survey also asked the respondents to comment and make recommendations about the outcomes and the study.

General information questions asked the respondents about demographic characteristics, working specialty, and levels of expertise.

The questionnaires for the second round survey consisted of three parts: organization of this questionnaire, the variables about the four NOC outcomes, and compensation information. The beginning of the second round questionnaires explained the purpose of the second round survey, the four NOC outcomes, and how to respond to this questionnaire with criteria for the results of the first round. The variable in the second round survey was the content validity, and comments about the outcomes were requested. Compensation questions asked the respondents about mailing addresses and residency.

The developed questionnaires were evaluated by two doctoral students in nursing before sending to the respondents. In this preliminary procedure, the doctoral students were asked to determine if the questionnaires were user-friendly, readable, and understandable. They also evaluated whether there were any technical problems when accessing the survey via email.

Data Collection and Procedures

Based on the invitation list, the investigator sent the invitation emails to potential respondents using Qualtrics for the first round survey. For C1, forty-two invitation emails were sent to fellows of the CNC on February 12, 2015, and the office of NANDA-I sent introduction emails about this study to members of NANDA-I on March 4, 2015. The introduction email explained the purpose of this study, inclusion criteria, compensation, and contact information for participating in this study. The investigator received emails

from 8 members of NANDA-I who were interested in participating in this study, and invitation emails were sent on March 9, 2015. For C2, one hundred thirty-eight invitation emails were sent to members of the MNRS who were members of the two RIGs: *Health Promoting Behaviors Across the Lifespan* or *Self Care* on February 12, 2015.

The invitation email included the consent information which was a) the purpose of the study, b) why subjects were invited, c) the subject's right to decline, d) risks and benefits, e) the confidentiality of all responses, f) compensation information, and g) contact information of the investigator. This email also included a link to access the survey and informed that accessing the link would indicate agreement of participation in this study.

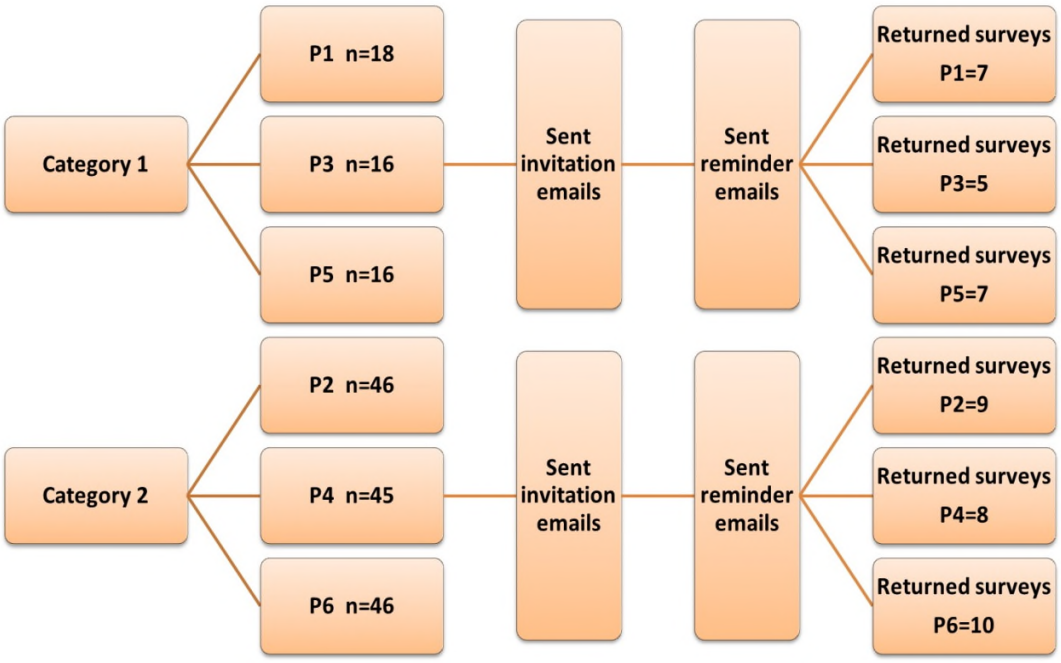


Figure 4. Data Collection Procedure for the First Round

Figure 4 shows the procedure for the first round data collection. Three days after the date of the initial emails, reminder emails about an incomplete survey were sent to respondents who had not completed the survey. Two weeks after from the date of the initial emails, reminder emails about no response were sent to respondents who had not participated in the survey in order to encourage them to join in the study.

After analyzing the data from the first round, the questionnaires for the second round were developed. The notification emails for the second round survey were sent to the first round respondents on May 26, 2015. Like the first round survey, this notification email explained the purpose of the second round survey, survey procedure, compensation information, the subject's right to decline, and contact information, and included a link to access the second round survey at the bottom of the email. Three days and two weeks later, reminder emails for incomplete and unanswered surveys were sent to the respondents. The introduction, invitation, reminder, and notification emails are in Appendix B.

Data Analysis and Interpretation

The purpose of data analysis was to provide statistical information about definition adequacy, content validity, clinical usefulness, and content similarity of the selected knowledge and self-management outcomes. The data were analyzed using SPSS WIN 21.0 and Microsoft Excel 2010. Data analysis was performed according to each specific aim.

Demographics and levels of expertise: Descriptive statistics were used.

Specific Aim 1. Definition Adequacy: Descriptive statistics were used to identify modes, means, and standard deviations (SD) of definition adequacy. Mann Whitney U-tests were used to compare the means of definition adequacy between the two expert categories.

Specific Aim 2. Content Validity: The OCV method was used to establish content validity of the outcomes in the first round. The following description is the OCV method to identify importance ratios for each indicator, and to calculate OCV scores of NOC outcomes.

1. Experts' ratings of 1 to 5 will be weighted as follows: 5=1.0; 4=0.75; 3=0.50; 2=0.25; and 1=0.
2. Weighted scores for each indicator were summed and divided by the total number of the responses to produce indicator ratios. The ratio of each indicator could reach only 1.0, and the meaning of this value is the indicator is very important for the outcome.
3. On the basis of the ratios, indicators were categorized in the three categories of importance: critical, supplemental, and unnecessary.
4. Weighted scores for each indicator in the critical and supplemental categories were summed and divided by the number of the indicators to calculate the OCV scores of the outcomes.

Mann Whitney U-tests were used to compare the importance of the indicators between the two expert categories. In the second round survey, descriptive statistics were used to examine frequencies of responses.

Specific Aim 3. Clinical Usefulness: Descriptive statistics were used to identify modes, means, and SDs of clinical usefulness. Mann Whitney U-tests were used to compare the means of clinical usefulness between the two expert categories.

Specific Aim 4. Content Similarity: Descriptive statistics were used to determine modes, means, and SDs of content similarity. Mann Whitney U-tests were used to compare the means of content similarity between the two expert categories.

Through the specific aims 1 to 4, Mann Whitney U-tests were used for comparisons between the two expert categories because the variables were not satisfied with the normality assumption (Table 7). In addition, the p-value was set at .10. Because this study was exploratory, a more flexible significance level was applied in this study.

Specific Aim 5. Recommendations: Qualitative data such as recommendations and comments were analyzed according to specific aims. All the comments were reviewed in their entirety several times and categorized into three areas which were definition, measurement scale, and indicator areas. The data within categories were reviewed critically by the investigator and are reported under the corresponding outcome labels and the final section in Chapter IV.

Table 7. Results of Normality Tests

Outcome	Category	Variables		
		Definition Adequacy	Clinical Usefulness	Content Similarity
Knowledge: Chronic Disease Management	1	.050	.182	−
	2	–[a]	.044	−
Self-Management: Chronic Disease	1	.140	.200	−
	2	.002	.002	.008
Knowledge: Diabetes Management	1	.019	.200	−
	2	<.001	.005	−

Table 7 continued

Self-Management: Diabetes	1	.140	.140	<.001
	2	.002	.002	.002
Knowledge: Cardiac Disease Management	1	.161	.026	−
	2	.001	.200	−
Self-Management: Cardiac Disease	1	.200	.046	.001
	2	<.001	.200	.001
Knowledge: Hypertension Management	1	.001	.001	−
	2	.012	.200	−
Self-Management: Hypertension	1	.026	.046	.200
	2	<.001	.200	.001
Knowledge: Coronary Artery Disease Management	1	.140	.039	−
	2	.009	.011	−
Self-Management: Coronary Artery Disease	1	.001	.001	<.001
	2	.035	<.001	<.001
Knowledge: Lipid Disorder Management	1	.050	.039	−
	2	.035	.035	−
Self-Management: Lipid Disorder	1	.001	.039	.007
	2	.091	.002	.035

[a] Tests (Kolmogorov-Smirnov) were not available.

Interpretation

For the specific aims 1, 3, and 4, the means of definition adequacy, clinical usefulness, and content similarity were used. Higher means of the variables indicated that the definition was perfectly adequate for capturing the essence of the outcome; the measurement scale was very relevant to measure indicators in clinical settings; and the indicators in the two outcomes were similar to each other to evaluate patient knowledge and behaviors.

For the specific aim 2, the OCV method was used. There were three categories for the importance of indicators based on ratios: critical, supplemental, and unnecessary. Ratios greater than or equal to 0.80 were categorized as critical indicators; those ratios

between 0.60 and 0.799 were categorized as supplemental indicators of a NOC outcome and its indicators; and those scoring below 0.60 were discarded as unnecessary indicators, and these indicators were not included to calculate OCV scores for NOC outcomes. Additionally, the mean of ratios of indicators categorized in the critical and supplemental levels was an OCV score of a NOC outcome. These score categories were applied to the first round survey.

Human Subjects

The proposed involvement of human subjects was participating in and completing surveys for this study from February 12 to July 1, 2015. The data were collected via the online survey tool Qualtrics, and the electronic data were stored in the secured server of Qualtrics. Respondent identification information was protected, and only the investigator accessed the server by using a password. No external devices were allowed to store data. The coded data were downloaded from the server to a statistical program for data analysis without any identifiers. Identifiers were replaced with an automated number. Compensation information was only used for the compensation procedure processed by the research office in the College of Nursing, University of Iowa. The approval from the University of Iowa Institutional Review Board was granted for the study on September 2, 2014 (Appendix C).

Summary

The purpose of this study was to validate the twelve nursing-sensitive patient outcomes focused on knowledge and self-management for adults with two chronic diseases: CVDs and diabetes. To achieve this purpose, a descriptive exploratory design was demonstrated, and two round surveys with the Delphi technique were used to collect data. In order to obtain sufficient professional opinions, there were the two categories for experts in SNL and self-management. The twelve NOC outcomes were categorized into the three Survey Sets based on similarity in describing diseases or conditions. The questionnaires were developed according to the Survey Sets for online survey. A total number of 188 invitation emails were sent with the questionnaires in the first round, and a total number of 46 notification emails were sent to the first round respondents in the second round. Descriptive statistics, Mann Whitney U-tests, and the OCV method were used to analyze the data from both rounds. Comments from the respondents were thoroughly reviewed and categorized corresponding to specific aims. All the results from both surveys are reported in Chapter IV.

CHAPTER IV

DATA ANALYSIS AND RESULTS

The results of the data analysis are presented in this chapter. Collected data were analyzed to verify the five specific aims of this study. The five specific aims were evaluations of definition adequacy (Aim 1), outcome and indicator importance (Aim 2), clinical usefulness (Aim 3), content similarity (Aim 4), and comments from respondents (Aim 5) about the 12 selected NOC outcomes.

The results of this research are presented in three sections. The first section describes response rates and levels of expertise. The level of expertise was evaluated using an adapted version of Fehring's expert rating system. In the second section, participant demographics and four specific aims are presented by the Survey Sets and NOC outcomes. Results about the specific aim 2 are explained after the results of the other aims 1, 3, and 4, because the specific aim 2 has separate tables from the result tables of the other aims. Also, particular comments related to the specific aims for each outcome are reported in this section. Finally, general comments from respondents about the study and the outcomes are presented in the third section.

Respondents

Response Rate

Using the Delphi technique, this study invited nurse experts from two content categories. Respondents in C1 were fellows from the CNC at the University of Iowa or members of NANDA-I. Respondents in C2 were members of the two RIGs in the MNRS,

Health Promoting Behaviors Across the Lifespan or *Self Care*. A total of 46 nurse experts participated in the first round survey of this study. Nineteen experts were in C1, and 27 were in C2. Of the 46 first round respondents, 27 experts repeatedly participated in the second round survey: 13 experts were in C1, and 14 experts were in C2.

In the first round survey, a total of 46 completed questionnaires were returned for analysis with an overall 24.2% rate of response (Table 8). For C1, 42 invitation emails were sent to fellows of CNC on February 12, 2015. Three of them refused to receive the email. Three days later, reminder emails were sent to fellows who had not completed the questionnaire. Two weeks later (February 25), reminder emails were sent to fellows who had not responded. After the initial and reminder emails, 12 of 42 questionnaires were returned with a 29% response rate, finally. The office of NANDA-I sent invitation emails for this study to members of NANDA-I on March 4, 2015. The investigator received emails from 8 members who were interested in participating in this study, and invitation emails were sent on March 9, 2015. Four days later, reminder emails were sent to encourage them to complete the survey and seven questionnaires were returned with an 88% response rate (7/8).

Table 8. Number of Participants by Panels in the First Round

Survey Set	Panel	Category 1			Category 2	Total
		CNC	NANDA-I	Subtotal	MNRS	
1	1	3	4	7	-	**16**
	2			-	9	
2	3	4	1	5	-	**13**
	4			-	8	
3	5	5	2	7	-	**17**
	6			-	10	
Rate		29%	88%	38%	20%	46/188 (24.4%)

For C2, 138 invitation emails were sent to members of the two RIGs in the MNRS on February 12, 2015. Three of them refused to receive the email. Three days and two weeks later, reminder emails were sent to members who had not completed the questionnaire. Finally, 27 of 138 questionnaires were returned with a 20% response rate (Table 8).

In the second round survey, a total of 46 questionnaires were sent to the first round respondents and 27 of them were returned with a 59% response rate (Table 9). For C1, 19 emails were sent to respondents from the CNC and NANDA-I on May 26, 2015. Reminder emails about either on incomplete survey and no response to the survey were sent after three days and again two weeks from the initial date (May 29 and June 8, 2015), respectively. A total of 13 questionnaires were returned for a response rate of 68%. For C2, 27 emails were sent to respondents from the MNRS on May 26, and the same procedure of C1 was applied. Finally, 14 of 27 questionnaires were returned for a 52% response rate.

Table 9. Number of Participants by Panels in the Second Round

Survey Set	Panel	Category 1			Category 2	Total
		CNC	NANDA-I	Subtotal	MNRS	
1	1	2	2	4	-	**9**
	2			-	5	
2	3	3	1	4	-	**8**
	4			-	4	
3	5	4	1	5	-	**10**
	6			-	5	
Rate		75%	57%	68%	52%	27/46 (59%)

Level of Respondent Expertise

A total of 46 respondents were evaluated to verify their levels of expertise in nursing languages and self-management. An adapted version of Fehring's validation model expert rating system was used after modification for this study (see Table 4). A minimum score for participation in this study was a total of 4 points.

The mean expert rating score of respondents was 6.5, and 33 respondents (72%) were rated over 5 points. All the respondents (100%) held at least a master's degree in nursing (4 points), and the range of expert rating scores was from 4 to 12 in this study. Seven of the 46 respondents (15.2%) had a master's degree and wrote a thesis focused on SNL or self-management for chronic diseases. Fifteen respondents (32.6%) conducted research, and 12 respondents (26%) published articles on SNL or self-management for chronic diseases. Doctoral dissertations on SNL or self-management for chronic diseases were completed by seven respondents (15.2%). More than half of respondents (52.2%) had clinical experiences in CVDs or diabetes. Eight respondents (17.4%) had a certification in an area of clinical practice relevant to CVDs or diabetes.

Description of Study Aims

The description of the study aims that follows is organized by the Survey Sets. There were three survey sets. Each survey set included four NOC outcomes and was evaluated by two panels. In each survey set section, demographic characteristics of the experts and results of the specific aims are reported by the outcome. Three specific aims 1, 3, and 4: definition adequacy, clinical usefulness, and content similarity were rated

using a 5-point scale. Higher scores indicated perfectly adequate to describe a definition, very relevant to measure indicators, and perfectly matched knowledge with behaviors content. Descriptive statistical analyses were used to examine participant demographics, specific aims 1, 3, and 4. These three aims were evaluated in the first round survey only. Specific aim 2, the importance of the outcome and its indicators for content validity, also was evaluated using a 5-point scale of 1 (not at all important) to 5 (very important) in the first round. The outcome content validity (OCV) method was used to calculate the indicator ratios and the OCV scores of outcomes in the first round. Indicators were categorized based on their ratios. Indicators with ratios equal to or greater than .80 were defined as critical indicators for determining the specific client outcome. Indicators with ratios of less than .80 but equal to or greater than .60 were identified as supplemental indicators. Indicators with importance ratios less than .60 were considered as unnecessary indicators. The indicator importance ratios were summed and divided by the total number of indicators to calculate the OCV score. The outcome with a .80 was evaluated as a critical outcome. In the second round, the importance of indicators in the first round was evaluated using a 3-choice scale of 1 (agree with the result), 2 (disagree with the result), and 3 (discard this indicator), but the indicator evaluated as unnecessary was not included. Descriptive statistical analyses were used to identify a consensus of the respondents by using frequency for the specific aim 2. To confirm the different perspectives between both expert categories, Mann-Whitney U-tests were used with a .10 significance level. Qualitative data for specific aim 5 were reviewed thoroughly and categorized by the specific aim. The analyses were conducted using IBM SPSS WIN 21.0. and Microsoft Excel 2010.

In this section, every NOC outcome has two tables to report results of the four specific aims 1, 2, 3, and 4. The table for specific aims 1, 3, and 4 describes the means, modes and *p*-values with the outcome definition and measurement scale. The table for specific aim 2 presents the indicator ratios and OCV scores from the first round survey, and the percentage of 'disagreement' and 'discard' by the respondents from the second round. The tables of results with details about specific aim 2 for the 12 NOC outcomes from both rounds are in Appendix D. The outcome indicators are listed in rank order according to the ratios generated in this chapter. The percentage of disagreement and discard are reported by panels. The specific comments for each outcome also are presented in this section.

Survey Set 1

Survey Set 1 included four NOC outcomes: *Knowledge: Chronic Disease Management, Self-Management: Chronic Disease, Knowledge: Diabetes Management,* and *Self-Management: Diabetes*.

Demographic Data of Survey Set 1

Sixteen of 64 invited experts (25%) from both categories responded to Survey Set 1 in the first round (Table 10). Seven of 18 nurse experts (39%) in C1 (P1) and 9 of 46 nurse experts (20%) in C2 (P2) participated in Survey Set 1, respectively. The mean age of respondents was 54.06 years (SD=12.95). The average experience in nursing was 28.44 years (SD=16.43). The number of years of specialty experience ranged from 1 to 45 years, with an average of 20.16 years (SD=15.20). All respondents were female, and the majority of them (87.5%) are currently working in nursing. Half of them worked at a

college or university as a researcher or educator, and a quarter of them worked at hospitals as a clinical specialist, case manager or nurse practitioner. All but one respondent (93.8%) had experiences in using SNL.

Table 10. Demographics for Survey Set 1 (n=16)

Characteristics		Mean (SD)		
		Panel 1	Panel 2	Total
Age (Year)		61.28 (12.64)	48.44 (10.65)	54.06 (12.95)
experience in nursing (Year)		36.85 (16.19)	21.88 (14.11)	28.44 (16.43)
experience in specialty (Year)		27.14 (13.22)	14.78 (15.01)	20.16 (15.20)
		Frequency (%)		
		P1	P2	Total
Gender	Female	7	9	16
Working in nursing	Yes	6 (37.5)	8 (50.0)	14 (87.5)
	No	1 (6.3)	1 (6.3)	2 (12.5)
Education	Master's in nursing	4 (25.0)	3 (18.8)	7 (43.8)
	Master's level	0	1 (6.3)	1 (6.2)
	PhD in nursing	1 (6.3)	4 (25.0)	5 (31.2)
	PhD level	1 (6.3)	0	1 (6.2)
	DNP	0	1 (6.3)	1 (6.2)
	Other	1 (6.3)	0	1 (6.2)
Working area	Hospital	2 (12.5)	2 (12.5)	4 (25)
	Ambulatory setting	0	1 (6.3)	1 (6.2)
	Professional organization	0	1 (6.3)	1 (6.2)
	College or university	3 (18.8)	5 (31.3)	8 (50)
	Other	2 (12.5)	0	2 (12.5)
Specialty (Multiple choice)	Education	1	2	3
	Geriatrics	1	1	2
	Home health	1	0	1
	Management	2	0	2
	Nursing informatics	1	1	2
	Medical-surgical	1	0	1
	Oncology	0	2	2
	Pediatrics	0	2	2
	Psychiatrics	0	1	1
	Public health	0	1	1
	Specialty medicine	0	1	1

Table 10 continued

	Specialty surgery	0	1	1
	Women's health	1	0	1
	Other	2	3	5
Position (Multiple choice)	Clinical specialist	2	0	2
	Case manager	1	0	1
	Nurse practitioner	0	2	2
	Researcher	0	5	5
	Educator	5	5	10
	Other	2	1	3
Experience in SNL	Yes	7 (43.8)	8 (50.0)	15 (93.8)
	No	0	1 (6.2)	1 (6.2)

The number of respondents were in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).

Knowledge: Chronic Disease Management

Definition Adequacy

The majority of respondents decided that the definition of the outcome *Knowledge: Chronic Disease Management* was quite adequate (mode=4) to describe this outcome. The mean of definition adequacy for this outcome evaluated by all the respondents was 4.06 (SD=.680). The two means by both panels were similar, and there was no statistically significant difference between panels (Table 11). The definition adequacy was rated as quite adequate by all experts in P2, however a few experts in P1 considered the definition was *slightly* adequate to describe this outcome.

Clinical Usefulness

Clinical usefulness for the relevance of use of the measurement scale of this outcome was rated as quite relevant (mode=4) to evaluate each indicator (Table 11). The mean of clinical usefulness for this outcome was 4.13 (SD=.719), and it was evaluated by all respondents. The two means by both panels were 4.29 (SD=.756) and 4.0 (SD=.707),

respectively. The respondents in the two panels rated from *moderately* relevant to *very* relevant for clinical usefulness.

Table 11. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Chronic Disease Management (n=16)

Definition	Extent of understanding conveyed about a specific chronic disease, its treatment, and the prevention of disease progression and complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
	Mode	Mean (SD) Total (n=16)	Panel 1 (n=7)	Panel 2 (n=9)	*p*	
Definition adequacy	4	4.06 (.680)	4.14 (1.06)	4.00 (0)	.351	
Clinical usefulness	4	4.13 (.719)	4.29 (.756)	4.00 (.707)	.470	

Outcome and Indicator Content Validity

There were 30 outcome indicators to evaluate the outcome *Knowledge: Chronic Disease Management.* Each outcome indicator was rated to establish content validity by calculating indicator ratios (IR) and OCV scores of this outcome. Twenty-two of 30 indicators were identified as critical, and 8 indicators were categorized as supplemental. No indicator was rated as 'not at all important' in the first round survey (Table 12). The most important indicator in this outcome was *Strategies to prevent complications* (1) with a .969 IR. On the other hand, the indicator *Required laboratory tests* (30) had the lowest ratio (IR=.688). The importance of this outcome was decided as a critical outcome (OCV=.842). The OCV score by P1 (OCV=.882) was moderately higher than the score by P2 (OCV=.811). The importance of 7 indicators was evaluated differently by both panels in the first round: indicators 17, 21−24, 27, and 28. These seven indicators were

evaluated as critical by P1 while they were determined as supplemental by P2, see Appendix D: Table D-1.

In the second round, the importance of the 30 indicators in this outcome was re-evaluated to confirm the results from the first round. The numbers of experts in both panels were four and five, respectively. The respondents in P1 had agreements about the importance of the 21 indicators. One or two experts in P1 disagreed with the results of the 9 indicators: 16, 17, 21−24, 26, 28, and 30. The experts in P2 agreed with the importance of the 21 indicators; however, they did not reach agreements about the results of the 9 indicators: 9, 14, 18, 22, 26−30. Two to three experts of both panels disagreed with the results of the 4 indicators: *Available community resources* (22), *Procedures involved in treatment regimen* (26), *Available support groups* (28), and *Required laboratory tests* (30). Except for the indicator 22, three of these indicators were categorized in the supplemental level in the first round. Table 12 shows the percent of disagreement and discard by the experts in each panel in the second round. Regardless of the evaluated importance in the first round, 4 indicators were rated as unnecessary for this outcome in the second round: Indicators *Potential medication interactions* (12), *Reputable sources of chronic disease information related to disease* (14), *Recommended immunizations* (27), and *Cultural influences on compliance to treatment regimen* (29).

There were several comments by the experts to improve this outcome. One of the suggestions was that a few indicators needed to be revised because they were related to behaviors rather than knowledge (e.g., *Correct use of prescribed medication* (Indicator 8)). The other suggestion was about the word *compliance*. One expert thought it would be better to change the word compliance to adherence or agreement with plan for treatment.

Table 12. Importance of the Outcome with Indicators in Knowledge: Chronic Disease Management

Results of 1st and 2nd Rounds about Knowledge: Chronic Disease Management							
		1st Round		2nd Round			
				Percent of			
Rank order	Indicators	Criteria	IR	Disagree		Discard	
				P1	P2	P1	P2
1	Strategies to prevent complications	Critical	.969	-[a]	-	-	-
2	Benefits of disease management	Critical	.953	-	-	-	-
3	Actions to take in an emergency	Critical	.953	-	-	-	-
4	Signs and symptoms of complications	Critical	.922	-	-	-	-
5	When to obtain assistance from a health professional	Critical	.922	-	-	-	-
6	Signs and symptoms of chronic disease	Critical	.891	-	-	-	-
7	Available treatment options	Critical	.891	-	-	-	-
8	Correct use of prescribed medication	Critical	.891	-	-	-	-
9	Personal responsibilities for treatment regimen	Critical	.891	-	20	-	-
10	Strategies to cope with adverse effects of disease	Critical	.891	-	-	-	-
11	Strategies to manage pain	Critical	.875	-	-	-	-
12	Potential medication interactions	Critical	.875			25	
13	Medication side effects	Critical	.859	-	-	-	-
14	Reputable sources of chronic disease information related to disease	Critical	.859	-	20	-	25
15	Medication therapeutic effects	Critical	.844	-	-	-	-
16	Prescribed diet	Critical	.844	25	-	-	-
17	Importance of compliance with treatment regimen +	Critical	.828	25	-	-	-
18	Financial resources for assistance	Critical	.828	-	20	-	-
19	Cause and contributing factors	Critical	.813	-	-	-	-
20	Usual course of disease	Critical	.813	-	-	-	-
21	Signs and symptoms of disease progression +	Critical	.813	25	-	-	-
22	Available community resources +	Critical	.813	25	40	-	-
23	Medication adverse effects +	Supplemental	.797	75	-	-	-
24	Strategies to balance activity and rest +	Supplemental	.781	50	-	-	-

Table 12 continued

25	Strategies for tobacco cessation	Supplemental	.781	-	-	-	-
26	Procedures involved in treatment regimen	Supplemental	.750	25	20	-	-
27	Recommended immunizations +	Supplemental	.750	-	20	25	-
28	Available support groups +	Supplemental	.750	50	20	-	-
29	Cultural influences on compliance to treatment regimen	Supplemental	.734	-	20	25	-
30	Required laboratory tests	Supplemental	.688	50	25	-	-
	OCV score		.842				

The number of respondents were in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Self-Management: Chronic Disease

Definition Adequacy

The majority of the raters indicated that the definition of the outcome *Self-Management: Chronic Disease* was quite adequate (mode=4) to describe this outcome (Table 13). The means of definition adequacy by the two panels ranged from 3.86 (SD=1.06) to 4.44 (SD=.527). The average mean of definition adequacy by all respondents was 4.19 (SD=.834). All experts in P2 rated that the definition was *quite* or *perfectly* adequate to describe the outcome. However, a few experts in P1 determined that the definition was *slightly* or *moderately* adequate.

Clinical Usefulness

The relevance of use of the measurement scale for this outcome was identified as very relevant (mode=5) for measuring the indicators. The mean of clinical usefulness for this outcome evaluated by all respondents was 4.25 (SD=.856). The two means by both panels were 4.0 (SD=1.15) and 4.44 (SD=.527) respectively, and there was no

statistically significant difference between both panels (Table 13). The range of ratings by the respondents in P2 was from *quite* to *perfectly* relevant, while a few respondents in P1 evaluated the measurement scale as *slightly* or *moderately* relevant to measure the indicators.

Table 13. Means and Modes of Definition Adequacy, Clinical Usefulness, and Content Similarity of Self-Management: Chronic Disease (n=16)

Definition	Personal actions to manage a chronic disease, its treatment, and to prevent disease progression and complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 1	Panel 2	*p*	
Definition adequacy	4	4.19 (.834)	3.86 (1.06)	4.44 (.527)	.299	
Clinical usefulness	5	4.25 (.856)	4.00 (1.15)	4.44 (.527)	.606	
Similarity of Chronic Disease pair	4	3.88 (.719)	4.00 (0)	3.78 (.972)	.758	

Content Similarity

The first pair of outcomes was *Knowledge: Chronic Disease Management* and *Self-Management: Chronic Disease*. The majority of the raters determined that the indicators for knowledge and behaviors in the two outcomes about a chronic disease were mostly matched (mode=4). The mean of the content similarity generated by all respondents was 3.88 (SD=.719. The two means by both panels were 4.00 and 3.78 (SD=.972), and there was no significant difference between the means (Table 13).

Outcome and Indicator Content Validity

The outcome *Self-Management: Chronic Disease* contains 51 indicators and they were rated to identify their importance. In the first round, 36 of the 51 indicators were evaluated as critical, 14 of the 51 indicators were supplemental, and one Indicator *Uses support group* (51) was identified as unnecessary for this outcome (Table 14). The most important indicator for this outcome was *Reports signs and symptoms of complications* (1) with a .984 IR. However, 3 of the 51 indicators were rated as 'not at all important' for this outcome by a few experts: Indicators *Obtains influenza seasonal vaccine* (36), *Avoids behaviors that potentiate disease progression* (40), and *Identifies cultural beliefs that impact treatment* (45). The total OCV by both panels for the importance of this outcome was designated as critical (OCV=.859). The two OCV scores of both panels were similar to each other (OCV=.874; OCV=.847). The importance of 12 indicators differed between panels. The rank orders in Table 14 of these 12 indicators were 34, 36−41, 43−46, and 51.

In the second round, Indicator 51 was not included because it was evaluated as unnecessary in the first round. The results of the 50 indicators were re-evaluated. The respondents in P1 reached agreements about the importance of 29 indicators: 1−8, 10, 12−17, 19, 20, 23, 24, 28, 31−35, 39, 43, 47, and 50. The experts in P2 also agreed with the results of 33 indicators: 1−17, 19, 21, 23, 25, 27−31, 34, 36, 37, 40, 41, 48, and 50. Two to three experts of both panels disagreed with the importance of 9 indicators: 18, 22, 26, 38, 42, 44−46, and 49 (Table 14). Regardless of the importance levels of indicators from the first round, two to three experts of both panels evaluated that 13 of the 50

indicators were unnecessary to measure this outcome: Indicators 20, 29, 33, 35−37, 40, and 45−50.

Several comments by the experts were related to the number of indicators. This outcome includes 51 indicators in order to describe general signs and symptoms from chronic diseases. Commenters stated that some indicators were duplicative and that patients may be overwhelmed because there were so many aspects of care plans which patients would have to follow.

Table 14. Importance of the Outcome with Indicators in Self-Management: Chronic Disease

Results of 1st and 2nd Rounds about Self-Management: Chronic Disease							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P1	P2	P1	P2
1	Reports signs and symptoms of complications	Critical	.984	-[a]	-	-	-
2	Monitors treatment side effects	Critical	.969	-	-	-	-
3	Uses strategies to prevent complications	Critical	.969	-	-	-	-
4	Participates in health care decisions	Critical	.969	-	-	-	-
5	Monitors signs and symptoms of disease	Critical	.953	-	-	-	-
6	Monitors for signs and symptoms of complications	Critical	.953	-	-	-	-
7	Uses treatment devices correctly	Critical	.953	-	-	-	-
8	Uses strategies to cope with effects of disease	Critical	.953	-	-	-	-
9	Develops plan for medical emergencies	Critical	.938	25	-	-	-
10	Follows recommended precautions	Critical	.922	-	-	-	-
11	Eliminates tobacco use	Critical	.922	50	-	-	-
12	Uses reputable sources of information	Critical	.922	-	-	-	-
13	Uses symptom relief strategies	Critical	.906	-	-	-	-
14	Follows recommended treatment	Critical	.906	-	-	-	-

Table 14 continued

15	Follows medication regimen	Critical	.906	-	-	-	-
16	Obtains advice from health professional as needed	Critical	.906	-	-	-	-
17	Keeps appointments with health professional	Critical	.906	-	-	-	-
18	Seeks information about methods to prevent complications	Critical	.891	25	20	-	-
19	Monitors medication side effects	Critical	.891	-	-	-	-
20	Monitors medication adverse effects	Critical	.891	-	40	25	-
21	Follows recommended diet	Critical	.891	25	-	-	-
22	Balances activity and rest	Critical	.891	25	40	-	-
23	Performs prescribed procedure	Critical	.875	-	-	-	-
24	Monitors treatment therapeutic effects	Critical	.875	-	20	-	-
25	Follows recommended activity level	Critical	.875	25	-	-	-
26	Participates in recommended exercises	Critical	.875	25	20	-	-
27	Adjusts life routine for optimal health	Critical	.875	25	-	-	-
28	Monitors changes in disease	Critical	.875	-	-	-	-
29	Uses health care services congruent with needs	Critical	.875	25	-	-	20
30	Discusses cultural beliefs that impact treatment with health provider	Critical	.859	50	-	-	-
31	Uses strategies to control pain	Critical	.859	-	-	-	-
32	Uses strategies to maintain adequate sleep	Critical	.844	-	20	-	-
33	Obtains pneumonia vaccine	Critical	.844	-	20	25	-
34	Monitors medication therapeutic effects +	Critical	.828	-	-	-	-
35	Uses strategies to enhance comfort	Critical	.813	-	20	25	-
36	Obtains influenza seasonal vaccine +	Critical	.813	50	-	50	-
37	Accepts diagnosis +	Supplemental	.797	25	-	25	-
38	Obtains required laboratory tests +	Supplemental	.797	50	20	-	-
39	Maintains optimum weight +	Supplemental	.797	-	20	-	-
40	Avoids behaviors that potentiate disease progression +	Supplemental	.797	25	-	-	20
41	Seeks information about disease +	Supplemental	.781	50	-	-	-
42	Seeks assistance for self-care	Supplemental	.781	25	20	-	-
43	Uses stress management strategies +	Supplemental	.781	-	20	-	-

Table 14 continued

44	Participates in prescribed educational program +	Supplemental	.766	25	40	-	-
45	Identifies cultural beliefs that impact treatment +	Supplemental	.750	25	40	25	-
46	Uses only nonprescription medication approved by health professional +	Supplemental	.750	25	40	25	-
47	Monitors vital signs	Supplemental	.750	-	20	-	20
48	Alters roles to meet treatment requirements	Supplemental	.688	25	-	-	20
49	Uses case manager to coordinate care	Supplemental	.672	25	20	25	-
50	Uses available community resources	Supplemental	.656	-	-	-	20
51	Uses support group +	Unnecessary	.594	NA	NA	NA	NA
	OCV score		.859				

The number of respondents were in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio/ NA none applied

Knowledge: Diabetes Management

Definition Adequacy

Most respondents of Survey Set 1 rated the definition of the outcome *Knowledge: Diabetes Management* was quite adequate (mode=4) to describe this outcome. The average score of definition adequacy rated by all the respondents was 4.0 (SD=.730). The two means by both panels were slightly different. The mean by P2 was slightly higher than that of P1, but there was no statistically significant difference (p=.351, Table 15). All the experts in P2 evaluated the definition was *quite* or *perfectly* adequate to describe the outcome, whereas a few experts in P1 rated the definition as *slightly* or *moderately* adequate. The specific comment about the definition of this outcome was that including etiology and potential consequences of diabetes would improve the clarity of definition.

Table 15. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Diabetes Management (n=16)

Definition	Extent of understanding conveyed about diabetes, its treatment, and the prevention of complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
	Mode	Mean (SD)				
		Total	Panel 1	Panel 2	*p*	
Definition adequacy	4	4.00 (.730)	3.71 (.951)	4.22 (.441)	.351	
Clinical usefulness	5	4.25 (.931)	4.00 (1.15)	4.44 (.726)	.536	

Clinical Usefulness

The clinical usefulness of this outcome was identified as quite relevant (mean=4.25, SD=.931, Table 15) to measure indicators using the measurement scale; however, the mode was 5 (very relevant). The two means by both panels were 4.0 (SD=1.15) and 4.44 (SD=.726), and indicated that the clinical usefulness was quite useful. However, the range of clinical usefulness was from *slightly* to *very* relevant by all the respondents in both panels.

Outcome and Indicator Content Validity

A total of 36 indicators were rated by the respondents to build the outcome content validity (Table 16). In the first round survey, 35 of the 36 indicators were evaluated as critical, and one indicator was designated as supplemental: *Correct procedure for urine ketone testing* (Indicator 36). The most important indicator for this outcome was *Correct use of Insulin* (1) with a perfect ratio (IR=1.0). On the other hand, the indicator *Correct procedure for urine ketone testing* (36) had the lowest ratio (IR=.750). The importance of this outcome by all the respondents was identified as

critical (OCV=.923). The OCV by P1 (OCV=.951) was slightly higher than the OCV by P2 (OCV=.901). The importance of two indicators differed between both panels: *Signs and symptoms of early disease* (Indicator 35) and Indicator 36. The ratios of these indicators by P1 were evaluated as supplemental while the ratios by P2 were categorized as critical in the first round (see Appendix D: Table D-3).

In the second round, the importance of 36 indicators was re-identified, and the respondents of both panels reached agreements about the results of most of the indicators. An expert in each panel disagreed with the importance of 5 indicators. The experts considered that the four indicators were not critical but supplemental for this outcome: *Medication adverse effects* (18), *Importance of dilated eye exam and vision testing by an ophthalmologist* (23), *Cause and contributing factors* (34), and Indicator 35. One expert in P1 thought the indicator 36 was not supplemental but critical (Table 16). Regardless of the evaluated importance of indicators, two indicators were rated as unnecessary for this outcome: Indicators 18 and 36 (*Correct procedure for urine ketone testing).*

Specific comments for this outcome were suggested. One of the respondents asked to include more psychosocial indicators because psychosocial factors such as depression or eating disorders have a huge impact on patient adherence. Changing words was recommended from how to use a monitoring device (Indicator 13) to how to use a blood glucose monitoring device. One of the suggestions was related to diabetic medication (Indicators 3 and 7). Because most patients use only one medication at a time, separating insulin and oral medication as an indicator was not needed. A few respondents evaluated that some indicators were related to behaviors rather than knowledge: Indicators *Correct use of prescribed medication* (9), *Proper disposal of syringes and*

needle (22), *Strategies to increase diet compliance* (25), and *Correct use of non-prescription medication* (27).

Table 16. Importance of the Outcome with Indicators in Knowledge: Diabetes Management

Results of 1st and 2nd Rounds about Knowledge: Diabetes Management							
		1st Round		2nd Round			
				Percent of			
Rank order	Indicators	Criteria	IR	Disagree		Discard	
				P1	P2	P1	P2
1	Correct use of insulin	Critical	1.00	-[a]	-	-	-
2	Actions to take in response to blood glucose levels	Critical	.984	-	-	-	-
3	Prescribed oral medication regimen	Critical	.984	-	-	-	-
4	Hypoglycemia and related symptoms	Critical	.969	-	-	-	-
5	Hypoglycemia prevention	Critical	.969	-	-	-	-
6	Procedures to be followed in treating hypoglycemia	Critical	.969	-	-	-	-
7	Prescribed insulin regimen	Critical	.969	-	-	-	-
8	Proper technique to draw up and administer insulin	Critical	.969	-	-	-	-
9	Correct use of prescribed medication	Critical	.969	-	-	-	-
10	Hyperglycemia and related symptoms	Critical	.953	-	-	-	-
11	Hyperglycemia prevention	Critical	.953	-	-	-	-
12	Importance of maintaining blood glucose level within target range	Critical	.953	-	-	-	-
13	How to use a monitoring device	Critical	.953	-	-	-	-
14	When to obtain assistance from a health professional	Critical	.953	-	-	-	-
15	Preventive foot care practices	Critical	.953	-	-	-	-
16	Onset, peak and duration of prescribed insulin	Critical	.938	-	-	-	-
17	Proper medication storage	Critical	.938	-	-	-	-
18	Medication adverse effects	Critical	.938	-	20	25	-
19	Role of diet in blood glucose control	Critical	.922	-	-	-	-
20	Procedures to be followed in treating hyperglycemia	Critical	.922	-	-	-	-
21	Plan for rotation of injection sites	Critical	.922	-	-	-	-

Table 16 continued

22	Proper disposal of syringes and needles	Critical	.922	-	-	-	-
23	Importance of dilated eye exam and vision testing by an ophthalmologist	Critical	.922	-	20	-	-
24	Reputable sources of diabetes information	Critical	.922	-	-	-	-
25	Strategies to increase diet compliance	Critical	.906	-	-	-	-
26	Role of exercise in blood glucose control	Critical	.906	-	-	-	-
27	Correct use of non-prescription medication	Critical	.906	-	-	-	-
28	Benefits of disease management	Critical	.906	-	-	-	-
29	Impact of acute illness on blood glucose level	Critical	.891	-	-	-	-
30	Medication side effects	Critical	.891	-	-	-	-
31	Prescribed meal plan	Critical	.875	-	-	-	-
32	Role of sleep in blood glucose control	Critical	.859	-	-	-	-
33	Medication therapeutic effects	Critical	.859	-	-	-	-
34	Cause and contributing factors	Critical	.828	25	-	-	-
35	Signs and symptoms of early disease +	Critical	.813	25	-	-	-
36	Correct procedure for urine ketone testing +	Supplemental	.750	25	-	-	20
	OCV score		.923				

The number of respondents were in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Self-Management: Diabetes

Definition Adequacy

Most raters evaluated the definition of the outcome *Self-Management: Diabetes* was quite adequate (mode=4) to describe this outcome (Table 17). The means of definition adequacy by the two panels ranged from 3.86 (SD=1.06) to 4.44 (SD=.527).

The mean by P2 was slightly higher than the mean by P1, but there was no statistically significant difference (p=.299). The mean of definition adequacy by all the respondents was 4.19 (SD=.834). The definition adequacy was rated as *quite* or *perfectly* adequate by all experts in P2; however, a few experts in P1 rated the definition as *slightly* or *moderately* adequate to describe this outcome.

Table 17. Means and Modes of Definition Adequacy, Clinical Usefulness and Content Similarity of Self-Management: Diabetes (n=16)

Definition	Personal actions to manage diabetes, its treatment, and to prevent complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 1	Panel 2	*p*	
Definition adequacy	4	4.19 (.834)	3.86 (1.06)	4.44 (.527)	.299	
Clinical usefulness	5	4.25 (.856)	3.86 (1.06)	4.56 (.527)	.210	
Similarity of Diabetes pair	4	4.00 (.516)	4.14 (.378)	3.89 (.601)	.470	

Clinical Usefulness

The mean of clinical usefulness of this outcome evaluated by all the respondents was 4.25 (SD=.856). The range of means by both panels was from 3.86 (SD=1.06) to 4.56 (SD=.527). The mean by P2 was higher than the mean by P1, but there was no statistical difference (Table 17). Even though a few experts in P1 rated the measurement scale as *slightly* or *moderately* relevant, most raters determined that this measurement scale was very relevant (mode=5) to evaluate the indicators. All the experts in P2 rated that this scale is *quite* or *very* relevant.

Content Similarity

The content of indicators in the pair *Knowledge: Diabetes Management* and *Self-Management: Diabetes* was mostly matched (mode=4). The mean of the content similarity evaluated by all the respondents was 4.0 (SD=.516). The range of means by both panels was from 3.89 (SD=.601) to 4.14 (SD=.378), and there was no significant difference (Table 17). Most raters identified the content similarity of this pair was *mostly* or *perfectly* matched; however, a few experts in P2 determined it was *partially* matched.

Outcome and Indicator Content Validity

The respondents evaluated a total of 44 indicators in the NOC outcome *Self-Management: Diabetes*. Thirty-eight of the 44 indicators were identified as critical. Six indicators were determined as supplemental, and no indicator was designated as unnecessary in the first round (Table 18). The most important indicator for this outcome was *Reports non-healing breaks in skin to primary care provider* (1) with a perfect ratio (IR=1.0). However, 2 indicators were rated as 'not at all important' for this outcome by a few respondents: Indicators *Obtains influenza seasonal vaccine* (36) and *Follows recommendations for alcohol use* (44). The average ratio of all indicators for the importance of this outcome was decided as critical (OCV=.887). The OCV by P1 (OCV=.904) was slightly higher than the OCV by P2 (OCV=.874). The importance of 7 indicators was evaluated differently by panels in the first round: Indicators 32, 33, 35, 36, 39, 41, and 44. The last indicator *Follows recommendations for alcohol use* (44) was identified as an unnecessary indicator (IR=.500) by P1,while the importance of Indicator 44 was considered as supplemental by P2 (IR=.722), see Appendix D: Table D-4.

The results of 44 indicators were re-determined in the second round. The experts in P1 agreed with the importance of 35 indicators among 44: Indicators 1−24, 26, 27, 32−35, 38, 39−41, and 44. On the other hand, the experts in P2 agreed with the results of 27 indicators: 1−13, 15−19, 21, 22, 26, 31, 32, 34, 39, 40, and 44. Two to three experts of both panels disagreed with the importance of 8 indicators: 25, 28−30, 36, 37, 42, and 43 (Table 18). One or two experts of each panel thought that 8 indicators were not necessary for this outcome (Indicators 14, 35, 36, 39, 40, 41, 43, and 44). Most indicators rated as unnecessary had low rankings. Specifically, the indicator *Uses only nonprescription medication approved by health professional* (40) was decided as unnecessary by the experts of both panels. Also, Indicator 36 was repeatedly rated as unnecessary for this outcome in both rounds.

The commenters in both panels suggested that reducing the length of this tool would make a better measurement tool. One comment about the indicator *Accepts diagnosis* (24) was that acceptance of a diagnosis is not a behavior for managing a disease. Some comments for the indicator *Obtains health care if blood glucose levels fluctuate outside of recommendations* (29) were that this indicator needs to be revised because health care and the outside of range of blood glucose levels are vague. The other comment for Indicator 36 (*Obtains influenza seasonal vaccine)* was that the flu vaccine does not have an impact on increased mortality epidemiologically.

Table 18. Importance of the Outcome with Indicators in Self-Management: Diabetes

Results of 1st and 2nd Rounds about Self-Management: Diabetes							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P1	P2	P1	P2
1	Reports non-healing breaks in skin to primary care provider	Critical	1.00	-[a]	-	-	-
2	Participates in prescribed educational program	Critical	.984	-	-	-	-
3	Performs treatment regimen as prescribed	Critical	.984	-	-	-	-
4	Performs correct procedure for blood glucose testing	Critical	.984	-	-	-	-
5	Monitors blood glucose	Critical	.984	-	-	-	-
6	Uses correct procedure for insulin administration	Critical	.984	-	-	-	-
7	Obtains required medication	Critical	.984	-	-	-	-
8	Uses medication as prescribed	Critical	.984	-	-	-	-
9	Participates in health care decisions	Critical	.969	-	-	-	-
10	Treats symptoms of hyperglycemia	Critical	.969	-	-	-	-
11	Reports symptoms of complications	Critical	.969	-	-	-	-
12	Stores insulin correctly	Critical	.969	-	-	-	-
13	Performs preventive foot care practices	Critical	.953	-	-	-	-
14	Obtains dilated vision examination as recommended	Critical	.953	-	20	-	20
15	Adjusts medication when acutely ill	Critical	.953	-	-	-	-
16	Obtains preconception counseling	Critical	.938	-	-	-	-
17	Treats symptoms of hypoglycemia	Critical	.906	-	-	-	-
18	Participates in recommended exercise	Critical	.906	-	-	-	-
19	Monitors frequency of hypoglycemia episodes	Critical	.891	-	-	-	-
20	Uses effective weight control strategies	Critical	.891	-	40	-	-
21	Participates in smoking cessation regimen	Critical	.891	-	-	-	-
22	Rotates injection sites	Critical	.891	-	-	-	-
23	Adjusts life routine for optimal health	Critical	.891	-	20	-	-
24	Accepts diagnosis	Critical	.875	-	20	-	-

Table 18 continued

25	Maintains optimum weight	Critical	.875	50	60	-	-
26	Monitors medication therapeutic effects	Critical	.875	-	-	-	-
27	Reports need for financial assistance	Critical	.875	-	40	-	-
28	Uses preventive measures to reduce risk for complications	Critical	.859	25	20	-	-
29	Obtains health care if blood glucose levels fluctuate outside of recommendations	Critical	.859	50	20	-	-
30	Uses health care services congruent with needs	Critical	.859	50	20	-	-
31	Maintains plan for medical emergencies	Critical	.859	25	-	-	-
32	Seeks information about methods to prevent complications +	Critical	.844	-	-	-	-
33	Uses diary to monitor blood glucose level over time +	Critical	.844	-	40	-	-
34	Keeps appointments with health professional	Critical	.844	-	-	-	-
35	Performs usual life routine +	Critical	.828	-	20	25	-
36	Obtains influenza seasonal vaccine +	Critical	.828	25	20	50	-
37	Follows recommended activity level	Critical	.813	25	20	-	-
38	Monitors body weight	Critical	.813	-	20	-	-
39	Monitors urinary glucose and ketones +	Supplemental	.797	-	-	-	20
40	Uses only nonprescription medication approved by health professional	Supplemental	.781	-	-	25	20
41	Obtains pneumonia vaccine +	Supplemental	.766	-	40	25	-
42	Follows recommended diet	Supplemental	.750	50	20	-	-
43	Monitors for signs and symptoms of depression	Supplemental	.750	25	20	-	20
44	Follows recommendations for alcohol use +	Supplemental	.625	-	-	-	20
	OCV score		.887				

The number of respondents were in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Survey Set 2

Survey Set 2 included four NOC outcomes: *Knowledge: Cardiac Disease Management, Self-Management: Cardiac Disease, Knowledge: Hypertension Management,* and *Self-Management: Hypertension*.

Demographic Data of Survey Set 2

Demographic data were collected on the 13 individuals (21.3%) who responded to Survey Set 2 in the first round (Table 19). Five of 16 nurse experts (31.2%) in C1 and 8 of 45 nurse experts (18%) in C2 participated in this survey as P3 and P4, respectively. The mean age of respondents was 52.92 years (SD=12.55). The average experience in nursing was 30.15 years (SD=12.85). The range of the number of years of specialty experience was from 2 to 37 years, with an average of 15 years (SD=11.77). All the respondents were female, and the majority of them (84.6%) are currently employed in nursing. More than 70% of participants worked at a college or university as a researcher or educator. The largest part of respondents (23.1%) had an expertise in special medicine areas. All of them had an experience in using SNL.

Table 19. Demographics for Survey Set 2 (n=13)

Characteristics		Mean (SD)		
		Panel 3	Panel 4	Total
Age (Year)		64.6 (5.03)	44.57 (8.77)	52.92 (12.55)
experience in nursing (Year)		42 (2.55)	22.7 (10.79)	30.15 (12.85)
experience in specialty (Year)		21.2 (13.1)	11.12 (9.74)	15 (11.77)
		Frequency (%)		
		P3	P4	Total
Gender	Female	5	8	13
Working in nursing	Yes	4 (30.8)	7 (53.8)	11 (84.6)
	No	1 (7.7)	1 (7.7)	2 (15.4)

Table 19 continued

Education	Master's in nursing	1 (7.7)	2 (15.4)	3 (23.1)
	PhD in nursing	3 (23.1)	4 (30.8)	7 (53.8)
	PhD level	1 (7.7)	2 (15.4)	3 (23.1)
Working area	Hospital	1 (7.7)	0	1 (7.7)
	Ambulatory setting	1 (7.7)	0	1 (7.7)
	Home health	0	1 (7.7)	1 (7.7)
	College or university	3 (23.1)	7 (53.8)	10 (76.9)
Specialty	Ambulatory care	0	1	1
(Multiple choice)	Education	1	2	3
	Geriatrics	1	1	2
	Home health	1	0	1
	Management	0	1	1
	Medical-surgical	1	1	2
	Oncology	2	0	2
	Pediatrics	1	0	1
	Public health	2	1	3
	Specialty medicine	1	6	6
	Women's health	0	1	1
	Other	1	2	3
Position	Staff nurse	1	1	2
(Multiple choice)	Clinical specialist	1	0	1
	Nurse practitioner	0	2	2
	Researcher	1	4	5
	Educator	2	4	6
	Other	2	2	4
Experience in SNL	Yes	5 (38.5)	8 (61.5)	13 (100)

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).

Knowledge: Cardiac Disease Management

Definition Adequacy

The majority of respondents determined that the definition of the outcome *Knowledge: Cardiac Disease Management* was quite adequate (mode=4) to describe this outcome. All the means for the definition adequacy by each and both panels were 4.0 (Table 20). The range of ratings by all the respondents was from *moderately* to *perfectly*

adequate. The one specific comment for the definition was that this definition does not appear to incorporate the individual role in management of cardiac disease.

Table 20. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Cardiac Disease Management (n=13)

Definition	Extent of understanding conveyed about heart disease, its treatment, and the prevention of disease progression and complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
			Mean (SD)			
	Mode	Total (n=13)	Panel 3 (n=5)	Panel 4 (n=8)		*p*
Definition adequacy	4	4.00 (.577)	4.00 (.707)	4.00 (.535)		-
Clinical usefulness	5	3.92 (1.15)	4.60 (.548)	3.50 (1.19)		.127

Clinical Usefulness

The clinical usefulness for the relevance of use of the measurement scale rated by the majority of respondents was very relevant (mode=5) to evaluate indicators (Table 20). The mean of clinical usefulness for the outcome *Knowledge: Cardiac Disease Management* was 3.92 (SD=1.15), and indicated that using this measurement scale is quite relevant for this outcome. The range of means by both panels was from 4.60 (SD=.548) to 3.50 (SD=1.19). All the experts in P3 determined this measurement scale was *quite* or *very* relevant while some experts in P4 evaluated this scale was *slight* or *moderately* relevant to evaluate indicators.

Outcome and Indicator Content Validity

There were 36 indicators to evaluate the outcome *Knowledge: Cardiac Disease Management*. Each indicator was rated for IR and OCV scores. For this outcome, 25 of

the 36 indicators were identified as critical, and 11 indicators were categorized as supplemental. There were no unnecessary indicators by the first round evaluation (Table 21). The most important indicator was *Signs and symptoms of worsening disease* (1) with a .962 IR. Indicator *Benefits of following a low-fat, low-cholesterol diet* (30) was rated as 'not at all important' for this outcome by a few experts. The importance of this outcome was decided as critical (OCV=.841). The OCV score by P3 was higher than the OCV by P4 (OCV=.876; OCV=.819). The importance of 13 indicators differed between panels: Indicators 15, 16, 19, 26−33, and 35. Among these 13 indicators, IR of the 11 indicators evaluated by P3 was higher than the IR by P4 (see Appendix D: Table D-5).

In the second round, the importance of 36 indicators was re-evaluated. The number of respondents in each panel was four. The experts in P3 agreed with the importance of 20 indicators: 1−6, 8, 10−19, 22, 23, and 33. The experts in P4 agreed with the results of 18 indicators: 1, 2, 4, 6, 7, 9−11, 13, 14, 17, 22−25, 30, 31, and 35. Two to four experts in both panels disagreed with the results of 9 indicators: 20, 21, 26−29, 32, 34, and 36 (Table 21). Eight of the 36 indicators were rated as unnecessary by one or two experts in each panel. These 8 indicators were evaluated as supplemental in the first round, and the importance of them was debatable in the second round: Indicators 28−34, and 36. Indicator 30 (*Benefits of following a low-fat, low-cholesterol diet*) was rated as unnecessary in both rounds.

There were several comments by the respondents to improve this outcome. One respondent stated that the indicators included sufficient knowledge to manage conditions. Adding indicators related to lipid levels such as total cholesterol, triglycerides (TG), low-density lipoprotein (LDL), and high-density lipoprotein (HDL) also was suggested. The

other comment was about Indicator 30. This indicator had a low ratio by P4 (IR=.656), and a few experts rated this indicator was 'not at all important' for this outcome in both rounds. The suggestion for this indicator was that encouraging patients to eat good fats such as olive and grapeseed oils, nuts, and avocado instead of focusing on a low-fat and low-cholesterol diet and to have more vegetables, fruits, and less simple carbohydrates would be better for this outcome.

Table 21. Importance of the Outcome with Indicators in Knowledge: Cardiac Disease Management

Results of 1st and 2nd Rounds about Knowledge: Cardiac Disease Management							
		1st Round		2nd Round			
				Percent of			
Rank order	Indicators	Criteria	IR	Disagree		Discard	
				P3	P4	P3	P4
1	Signs and symptoms of worsening disease	Critical	.962	-[a]	-	-	-
2	Strategies to reduce risk factors	Critical	.962	-	-	-	-
3	Benefits of regular exercise	Critical	.942	-	25	-	-
4	Strategies to manage stress	Critical	.942	-	-	-	-
5	Benefits of disease management	Critical	.923	-	25	-	-
6	When to obtain assistance from a health professional	Critical	.923	-	-	-	-
7	Strategies to limit sodium intake	Critical	.904	25	-	-	-
8	Strategies to decrease treatment side effects	Critical	.885	-	25	-	-
9	Importance of tobacco abstinence	Critical	.885	25	-	-	-
10	Recommended physical activity	Critical	.885	-	-	-	-
11	Medication therapeutic effects	Critical	.885	-	-	-	-
12	Medication side effects	Critical	.885	-	25	-	-
13	Family's role in treatment plan	Critical	.865	-	-	-	-
14	Signs and symptoms of early disease	Critical	.846	-	-	-	-
15	Methods to measure blood pressure +	Critical	.846	-	25	-	-
16	Methods to monitor heart rate +	Critical	.846	-	25	-	-
17	Strategies to increase diet compliance	Critical	.846	-	-	-	-
18	Energy conservation techniques +	Critical	.846	-	50	-	-
19	Medication adverse effects +	Critical	.846	-	25	-	-

Table 21 continued

20	Importance of obtaining influenza seasonal vaccine	Critical	.846	25	50	-	-
21	Importance of obtaining pneumonia vaccine	Critical	.846	25	50	-	-
22	Importance of completing cardiac rehabilitation	Critical	.827	-	-	-	-
23	Guidelines for sexual activity	Critical	.827	-	-	-	-
24	Reputable sources of cardiac disease information	Critical	.827	50	-	-	-
25	Care options for assistance with medical emergencies	Critical	.808	25	-	-	-
26	Strategies to limit fluid intake +	Supplemental	.789	50	25	-	-
27	Importance of monitoring weight +	Supplemental	.789	50	25	-	-
28	Cultural influences on compliance to treatment regimen +	Supplemental	.789	25	25	-	25
29	Available support groups +	Supplemental	.789	25	25	25	-
30	Benefits of following a low-fat, low-cholesterol diet +	Supplemental	.750	50	-	25	-
31	Importance of alcohol restrictions +	Supplemental	.750	25	-	25	-
32	Recommended work activity +	Supplemental	.750	25	50	25	-
33	Recommended leisure activity +	Supplemental	.750	-	50	50	-
34	Potential sexual difficulties	Supplemental	.750	25	75	50	-
35	Importance of family learning cardiopulmonary resuscitation +	Supplemental	.750	50	-	-	-
36	Usual course of disease	Supplemental	.712	25	25	50	25
	OCV score		.841				

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Self-Management: Cardiac Disease

Definition Adequacy

Most respondents of Survey Set 2 rated that the definition of the outcome *Self-Management: Cardiac Disease* was quite adequate (mode=4) to describe this outcome (Table 21). The means of definition adequacy by both panels ranged from 3.63

(SD=1.06) to 4.20 (SD=.837), and the average mean by all the respondents was 3.85 (SD=.987). Although the mean by P4 was slightly lower than the mean by P3, there was no significant difference (p=.328). The definition adequacy was rated as *quite* or *perfectly* adequate by all experts in P3 while a few experts in P4 rated the definition was *not at all* or *slightly* adequate to describe the outcome.

Clinical Usefulness

The clinical usefulness of this outcome was evaluated as very relevant (mode=5) by the majority of raters in Survey Set 2 (Table 22). The mean of clinical usefulness by all the respondents was 3.77 (SD=1.23). The range of means by both panels was from 4.40 (SD=.894) to 3.38 (SD=1.30). The mean by P3 was higher, but there was no statistical difference between panels (p=.171). Although the majority of the respondents determined that using this measurement scale was *very* relevant, some experts identified this scale was *slightly* or *moderately* relevant to evaluate indicators.

Table 22. Means and Modes of Definition Adequacy, Clinical Usefulness, and Content Similarity of Self-Management: Cardiac Disease (n=13)

Definition	Personal actions to manage heart disease, its treatment, and to prevent disease progression and complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 3	Panel 4	*p*	
Definition adequacy	4	3.85 (.987)	4.20 (.837)	3.63 (1.06)	.435	
Clinical usefulness	5	3.77 (1.23)	4.40 (.894)	3.38 (1.30)	.171	
Similarity of Cardiac Disease pair	4	4.08 (.76)	4.80 (.447)	3.63 (.518)	.006	

Content Similarity

The pair for the content similarity comprised two outcomes *Knowledge: Cardiac Disease Management* and *Self-Management: Cardiac Disease*. Most raters evaluated the content similarity between these two NOC outcomes was mostly matched (mode=4). The mean of the content similarity by all the respondents was 4.08 (SD=.76). However, most experts in P4 rated that indicators for knowledge and behaviors in these two outcomes about cardiac diseases were *partially* or *mostly* matched. Perspectives by both panels about the content similarity were statistically different (p=.006, Table 22).

Outcome and Indicator Content Validity

This outcome contains 45 indicators and they were rated to identify their importance. Thirty-five of the 45 indicators were evaluated as critical, and 10 indicators were identified as supplemental for this outcome in the first round (Table 23).The most important indicator for this outcome was *Monitors symptom onset* (1) with a .962 IR. However, 6 of the 45 indicators were rated that they were 'not at all important' for this outcome by a few respondents in the first round. These 6 indicators were ranked at 13th, 14th, 39th, 40th, 41st, and 43rd in Table 23. The importance of this outcome was designated as critical (OCV=.846), and the two OCV scores for the outcome by both panels were similar (OCV=.840; OCV=.850). The importance of 10 indicators was evaluated differently by panels: Indicators 33−40, 44, and 45(see Appendix D: Table D-6).

In the second round, the importance of 45 indicators was re-evaluated. The experts in P3 agreed with the results of 22 indicators: 3, 5, 6, 10, 11, 13, 14, 16, 17, 22, 23, 25−28, 30, 34, and 41−45. The experts in P4 had agreements about the importance of

22 indicators: 1−5, 7−10, 12−14, 16, 1, 22−24, 26, 30, 31, 33, and 44. Two to five experts in both panels disagreed with the results of 13 indicators: 15, 18−21, 29, 32, and 35−40. In addition, two to five experts of both panels responded that 9 indicators were not necessary for this outcome: 28, 33, 36, 38, 39, 41, 42, 43, and 44 (Table 23). Three indicators *Limits fat and cholesterol intake* (39), *Participates in screening for cholesterol* (41), and *Performs usual life routine* (43) were rated as a not important indicator in both rounds.

Several comments by the experts were raised. One of the suggestions was to add indicators related to obtaining lab results such as liver enzymes or creatinine because these lab results are important to detect side effects to medications. The other comment asked to change the label of the outcome to Effective Self-Management: Cardiac Disease. There was a comment related to the two indicators *Obtains influenza seasonal vaccine* (20) and *Obtains pneumonia vaccine* (21). An expert suggested that appropriate vaccines for specific ages and conditions would be recommended to patients instead of only two influenza and pneumonia vaccines. Creating an indicator about social support also was recommended because social support is especially important for women with heart diseases. A respondent recommended that a few indicators should be revised from original one to *monitors sodium intake* (Indicator 15), *monitors fluid intake* (Indicator 27), and *monitors weight* (Indicators 17 and 29).

Table 23. Importance of the Outcome with Indicators in Self-Management: Cardiac Disease

Results of 1st and 2nd Rounds about Self-Management: Cardiac Disease							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P3	P4	P3	P4
1	Monitors symptom onset	Critical	.962	25	-[a]	-	-
2	Monitors symptom frequency	Critical	.942	25	-	-	-
3	Uses preventive measures to reduce risk of complications	Critical	.942	-	-	-	-
4	Participates in smoking cessation regimen	Critical	.942	25	-	-	-
5	Uses medication as prescribed	Critical	.942	-	-	-	-
6	Participates in health care decisions	Critical	.923		25	-	-
7	Monitors symptom persistence	Critical	.923	25	-	-	-
8	Monitors symptom severity	Critical	.923	25	-	-	-
9	Uses symptom relief methods	Critical	.904	25	-	-	-
10	Obtains required medication	Critical	.904	-	-	-	-
11	Adjusts life routine for optimal health	Critical	.904	-	25	-	-
12	Reports signs and symptoms of depression	Critical	.885	25	-	-	-
13	Reports symptoms of worsening disease	Critical	.865	-	-	-	-
14	Obtains health care when warning signs occur	Critical	.865	-	-	-	-
15	Limits sodium intake	Critical	.865	25	25	-	-
16	Follows recommended diet	Critical	.865	-	-	-	-
17	Monitors body weight	Critical	.865	-	-	-	-
18	Balances activity and rest	Critical	.865	25	25	-	-
19	Uses stress management strategies	Critical	.865	25	25	-	-
20	Obtains influenza seasonal vaccine	Critical	.865	25	25	-	-
21	Obtains pneumonia vaccine	Critical	.865	25	25	-	-
22	Keeps appointments with health professional	Critical	.865	-	-	-	-
23	Maintains plan for medical emergencies	Critical	.865	-	-	-	-
24	Seeks information about methods to maintain cardiovascular health	Critical	.846	25	-	-	-
25	Participates in prescribed cardiac rehabilitation	Critical	.846	-	25	-	-

Table 23 continued

26	Monitors blood pressure	Critical	.846	-	-	-	-
27	Follows fluid restrictions	Critical	.846	-	25	-	-
28	Uses effective weight control strategies	Critical	.846	-	25	25	
29	Maintains optimum weight	Critical	.846	50	25	-	-
30	Monitors prescribed medication therapeutic effects	Critical	.846	-	-	-	-
31	Uses health care services congruent with needs	Critical	.846	25	-	-	-
32	Follows recommendations for alcohol use	Critical	.827	50	25	-	-
33	Reports need for financial assistance +	Critical	.827	50	-	25	-
34	Performs treatment regimen as prescribed +	Critical	.808	-	25	-	-
35	Uses energy conservation techniques +	Critical	.808	25	25	-	-
36	Accepts diagnosis +	Supplemental	.789	50	25	-	50
37	Monitors pulse rate and rhythm +	Supplemental	.789	25	75	-	-
38	Uses only nonprescription medication approved by health professional +	Supplemental	.789	25	50	25	25
39	Limits fat and cholesterol intake +	Supplemental	.769	25	50	25	-
40	Participates in recommended exercise +	Supplemental	.769	50	75	-	-
41	Participates in screening for cholesterol	Supplemental	.769	-	25	50	-
42	Follows recommendations for sexual activity	Supplemental	.731	-	25	50	-
43	Performs usual life routine	Supplemental	.692	-	25	75	50
44	Monitors effects of stimulants +	Supplemental	.673	-	-	50	-
45	Uses diary to monitor symptoms over time +	Supplemental	.654	-	25	-	-
	OCV score		.846				

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Knowledge: Hypertension Management

Definition Adequacy

The majority of the raters indicated that the definition of the outcome *Knowledge: Hypertension Management* was quite adequate (mode=4) to describe this outcome (Table 24). The mean of definition adequacy by all the respondents was 4.23 (SD=.725). The two means by both panels were 4.80 (SD=.725) and 3.88 (SD=.725), and there was a statistically significant difference (p=.030). Most experts in P3 evaluated the definition was *perfectly* adequate, whereas a few experts in P4 identified the definition was *moderately* or *quite* adequate. To improve the definition, one suggestion was to add *prevention of disease progression leading to heart disease, heart failure, and stroke* instead of prevention of complications.

Table 24. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Hypertension Management (n=13)

Definition	Extent of understanding conveyed about high blood pressure, its treatment, and the prevention of complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
	Mode	Mean (SD) Total	Panel 3	Panel 4	*p*	
Definition adequacy	4	4.23 (.725)	4.80 (.447)	3.88 (.641)	.030	
Clinical usefulness	5	4.00 (.108)	4.60 (.894)	3.63 (1.06)	.127	

Clinical Usefulness

The mean of clinical usefulness of the outcome *Knowledge: Hypertension Management* rated by all the respondents was 4.0 (SD=.108). On the other hand, most

raters evaluated that the relevance of use of the measurement scale was very relevant (mode=5). The two means by both panels were 4.60 (SD=.894) and 3.63 (SD=1.06). Although there was no statistical difference, the mean by P3 was higher (Table 24). A few experts in P4 decided that this measurement scale was *slightly* or *moderately* relevant to evaluate indicators.

Outcome and Indicator Content Validity

A total of 31 indicators were rated by respondents to evaluate the importance. For this outcome, 29 of the 31 indicators were categorized in the critical level, and 2 indicators were categorized in the supplemental level (Table 25): Indicators *Strategies to manage stress* (30) and *Available support groups* (31). Two of the 31 indicators were rated as 'not at all important' for this outcome by a few experts in the first round: Indicator *Methods to measure blood pressure* (26) and Indicator 31. On the other hand, the most important indicator was *Normal range for diastolic blood pressure* (1) with a .942 IR. The importance of this outcome was identified as critical (OCV=.864). The OCV score by P3 was slightly higher than the OCV by P4 (OCV=.889; OCV=.849). The importance of 6 indicators differed between both panels (Indicators 25−30). The ratios of these 6 indicators by P3 were in the critical level while the ratios by P4 were in the supplemental level (see Appendix D: Table D-7).

In the second round, the results of 31 indicators were re-determined. The experts in P3 had agreements about the importance of 20 indicators: 1−7, 12−14, 16, 18−22, 25, 26, 30, and 31. The experts in P4 agreed with the results of 13 indicators: 2, 4, 6, 12−18, 21, 24, and 26. Two to four experts in both panels disagreed with the importance of 8

indicators: 8−11, 23, and 27−29 (Table 25). In the second round, no indicator was rated as unnecessary.

Specific comments for this outcome were suggested. One comment was related to Indicator 26 (*Methods to measure blood pressure)*. The comment suggested that there are several knowledge components (e.g., systolic, diastolic, and purse pressure, cuff size for arms, and differences between arms) related to monitor blood pressure; thus, revisions of Indicator 26 were recommended. The other comment stated that Indicators 26 and 31 (*Available support groups)* would not be necessary for this outcome. Both indicators were rated as 'not at all important' for this outcome in the first round.

Table 25. Importance of the Outcome with Indicators in Knowledge: Hypertension Management

Results of 1st and 2nd Rounds about Knowledge: Hypertension Management							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P3	P4	P3	P4
1	Normal range for diastolic blood pressure	Critical	.942	-[a]	25	-	-
2	Signs and symptoms of exacerbation of hypertension	Critical	.942	-	-	-	-
3	Importance of adherence to treatment	Critical	.942		25	-	-
4	Benefits of long-term treatment	Critical	.923	-	-	-	-
5	Benefits of regular exercise	Critical	.923		25	-	-
6	Target blood pressure	Critical	.904	-	-	-	-
7	Medication adverse effects	Critical	.904	-	25	-	-
8	Strategies to change dietary habits	Critical	.904	25	25	-	-
9	Strategies to limit sodium intake	Critical	.904	25	25	-	-
10	Strategies to increase diet compliance	Critical	.904	25	25	-	-
11	Importance of tobacco abstinence	Critical	.904	25	25	-	-
12	Potential complications of hypertension	Critical	.885	-	-	-	-

Table 25 continued

13	Medication therapeutic effects	Critical	.885	-	-	-	-
14	Medication side effects	Critical	.885	-	-	-	-
15	Available treatment options	Critical	.865	25	-	-	-
16	Correct use of prescribed medication	Critical	.865	-	-	-	-
17	Reputable sources of hypertension information	Critical	.865	25	-	-	-
18	When to obtain assistance from a health professional +	Critical	.865	-	-	-	-
19	Benefits of disease management	Critical	.865	-	25	-	-
20	Importance of informing health professional of all current medication	Critical	.846	-	25	-	-
21	Recommended schedule for monitoring blood pressure	Critical	.846	-	-	-	-
22	Benefits of ongoing self-monitoring	Critical	.827	-	50	-	-
23	Benefits of lifestyle modifications	Critical	.827	25	25	-	-
24	Adverse health effects of alcohol use	Critical	.827	50	-	-	-
25	Normal range for systolic blood pressure +	Critical	.808	-	25	-	-
26	Methods to measure blood pressure +	Critical	.808	-	-	-	-
27	Importance of keeping follow-up appointments +	Critical	.808	25	25	-	-
28	Benefits of weight loss +	Critical	.808	25	25	-	-
29	Prescribed diet +	Critical	.808	25	25	-	-
30	Strategies to manage stress +	Supplemental	.789	-	50	-	-
31	Available support groups	Supplemental	.712	-	25	-	-
	OCV score		.864				

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Self-Management: Hypertension

Definition Adequacy

Most raters determined that the definition of the outcome *Self-Management: Hypertension* was quite adequate (mode=4) to describe this outcome (Table 26). The two means of definition adequacy by both panels ranged from 3.63 (SD=.744) to 4.60

(SD=.548). The mean by P3 was higher than the mean by P4, and there was a statistically significant difference (p=.045). The experts in P3 evaluated the definition was *quite* or *perfectly* adequate; however, some experts in P4 rated the definition was *slightly* or *moderately* adequate to explain the outcome. The specific comment for this definition was similar to the suggestion for the outcome Knowledge: Hypertension Management that was to change words from prevention of complications to *prevention of disease progression leading to heart disease, heart failure, and stroke*.

Table 26. Means and Modes of Definition Adequacy, Clinical Usefulness, and Content Similarity of Self-Management: Hypertension (n=13)

Definition	Personal actions to manage high blood pressure, its treatment, and to prevent complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 3	Panel 42	*p*	
Definition adequacy	4	4.00 (.816)	4.60 (.548)	3.63 (.744)	.045	
Clinical usefulness	5	4.15 (.899)	4.40 (.894)	4.00 (.926)	.524	
Similarity of Hypertension pair	4	4.08 (.641)	4.20 (.837)	4.00 (.535)	.622	

Clinical Usefulness

The relevance of use of the measurement scale of this outcome was identified as very relevant (mode=5) to evaluate the indicators (Table 26). The mean of clinical usefulness rated by all the respondents was 4.15 (SD=.899). The two means by both panels were 4.40 (SD=.894) and 4.0 (SD=.926), respectively. The range of ratings by all the respondents was from *moderately* to *very* relevant.

Content Similarity

The indicators between the two outcomes *Knowledge: Hypertension Management* and *Self-Management: Hypertension* were considered as mostly matched (mode=4) by the majority of respondents in Survey Set 2 (Table 26). The means of content similarity by both panels were 4.20 (SD=.837) and 4.0 (SD=.535), and the mean by all respondents was 4.08 (SD=.641). All the respondents in both panels rated the content similarity of this pair was from *partially* to *perfectly* matched.

Outcome and Indicator Content Validity

The respondents evaluated a total of 33 indicators in this outcome. Twenty-one of the 33 indicators were identified as critical. Twelve indicators were determined as supplemental, and there was no indicator evaluated as unnecessary in the first round (Table 27). A few respondents rated 3 of the 33 indicators as 'not at all important' for this outcome, and the importance of these 3 indicators (Indicators 25, 32, and 33) was supplemental. The most important indicator in this outcome was *Uses medication as prescribed* (1) with a .962 IR. The importance of this outcome was decided as critical (OCV=.826), and the two OCV scores by both panels were similar to each other (OCV=.817; OCV=.832). The importance of 11 indicators was evaluated differently by panels: Indicators 14, 15, 19, 21−26, 30, and 33, see Appendix D: Table D-8.

In the second round, the importance of 33 indicators was re-evaluated to confirm the results from the first round. The experts in P3 agreed with the importance of 19 indicators: 1, 2, 4, 7−9, 11, 12, 15, 18, 22−24, 26−28, 30, 32, and 33. The experts in P4 agreed with the importance of 16 indicators: 1, 5−7, 10, 12−19, 21, 24, and 28. About 5

indicators, two to five experts of both panels disagreed with the evaluated importance: Indicators 3, 20, 25, 29, and 31 (Table 27). Also, one or two experts in each panel considered that 8 indicators were not necessary for this outcome in the second round: Indicators 20, 24−28, 31, and 33. Among these 8 indicators, the two indicators *Monitors for complications of hypertension* (25) and *Uses support group* (33) overlapped the indicators rated as 'not at all important' for this outcome in the first round.

There were a few specific comments for this outcome. A respondent commented that the indicators in this outcome did not cover work activities; thus, this should be a part of measurements.

Table 27. Importance of the Outcome with Indicators in Self-Management: Hypertension

Results of 1st and 2nd Rounds about Self-Management: Hypertension							
		1st Round		2nd Round			
				Percent of			
				Disagree		Discard	
Rank order	Indicators	Criteria	IR	P3	P4	P3	P4
1	Uses medication as prescribed	Critical	.962	-[a]	-	-	-
2	Performs correct procedure for blood pressure measurement	Critical	.923	-	25	-	-
3	Uses relaxation techniques	Critical	.923	50	25	-	-
4	Monitors blood pressure	Critical	.904	-	25	-	-
5	Limits sodium intake	Critical	.904	25	-	-	-
6	Participates in smoking cessation regimen	Critical	.904	25	-	-	-
7	Maintains target blood pressure	Critical	.885	-	-	-	-
8	Monitors medication side effects	Critical	.885	-	25	-	-
9	Maintains optimum body weight	Critical	.885	-	25	-	-
10	Uses reputable sources of information	Critical	.885	25	-	-	-
11	Monitors medication adverse effects	Critical	.865	-	25	-	-
12	Participates in recommended exercises	Critical	.865	-	-	-	-

Table 27 continued

13	Limits high calorie fluids	Critical	.865	50	-	-	-
14	Contacts health provider when not in target range +	Critical	.865	25	-	-	-
15	Monitors medication therapeutic effects +	Critical	.846	-	-	-	-
16	Uses only nonprescription medication approved by health professional	Critical	.846	25	-	-	-
17	Uses strategies for weight reduction	Critical	.846	25	-	-	-
18	Keeps appointments with health professional	Critical	.846	-	-	-	-
19	Limits high calorie snacks +	Critical	.827	50	-	-	-
20	Limits caffeine consumption	Critical	.827	25	25	-	25
21	Follows recommended diet +	Critical	.808	25		-	-
22	Uses stress management strategies +	Supplemental	.789	-	50	-	-
23	Uses social support +	Supplemental	.789	-	50	-	-
24	Checks calibration of home blood pressure device +	Supplemental	.769	-	-	-	25
25	Monitors for complications of hypertension +	Supplemental	.769	50	50	25	-
26	Uses available community resources +	Supplemental	.769	-	25	25	-
27	Decreases food portions	Supplemental	.750	-	25	25	25
28	Seeks financial resources	Supplemental	.750	-	-	50	-
29	Follows recommendations for alcohol use	Supplemental	.731	25	25	-	-
30	Uses diary to monitor blood pressure over time +	Supplemental	.731	-	25	-	-
31	Eliminates tobacco use	Supplemental	.712	25	75	25	-
32	Uses strategies to maintain adequate sleep	Supplemental	.692	-	50	-	-
33	Uses support group +	Supplemental	.654	-	25	-	25
	OCV score		.826				

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Survey Set 3

Survey Set 3 included four NOC outcomes: *Knowledge: Coronary Artery Disease Management, Self-Management: Coronary Artery Disease, Knowledge: Lipid Disorder Management,* and *Self-Management: Lipid Disorder*.

Demographic Data of Survey Set 3

Seventeen of 63 invited experts (27%) responded to Survey Set 3 in the first round (Table 28). Seven of 16 nurse experts (43.7%) in C1 and 10 of 47 nurse experts (21.2%) in C2 participated in Survey Set 3 as P5 and P6, respectively. The mean age of the respondents was 49.06 years (SD=13.69). The average experience in nursing was 25.03 years (SD=14.95). The average year of specialty experience was 16.91 (SD=11.31), and the range was from 1 to 38 years. The majority of participants (94.1) were female and more than 80% were employed in nursing currently. More than 70% of respondents worked at a college or university as a researcher or educator, and less than a quarter of them worked at a hospital or ambulatory setting as a registered nurse or nurse practitioner. The largest part of the sample (29.6%) had a specialty in the medical-surgical area. Ten of 17 (58.8%) had an experience in using SNLs.

Table 28. Demographics for the Survey Set 3 (n=17)

Characteristics		Mean (SD)		
		Panel 5	Panel 6	Total
Age (Year)		54.86 (9.15)	45 (15.26)	49.06 (13.69)
experience in nursing (Year)		33.29 (8.59)	19.25 (16.01)	25.03 (14.95)
experience in specialty (Year)		20.57 (10.67)	14.34 (11.57)	16.91 (11.31)
		Frequency (%)		
		P5	P6	Total
Gender	Female	7 (41.2)	9 (52.9)	16 (94.1)
	Male	0	1 (5.9)	1 (5.9)

Table 28 continued

Working in nursing	Yes	6 (35.3)	9 (52.9)	15 (88.2)
	No	1 (5.9)	1 (5.9)	2 (11.8)
Education	Master's in nursing	1 (5.9)	5 (29.4)	6 (35.3)
	Master's level	0	1 (5.9)	1 (5.9)
	PhD in nursing	4 (23.5)	3 (17.6)	7 (41.2)
	PhD level	1 (5.9)	0	1 (5.9)
	DNP	1 (5.9)	1 (5.9)	2 (11.8)
Working area	Hospital	0	3 (17.6)	3 (17.6)
	Ambulatory setting	0	1 (5.9)	1 (5.9)
	Research organization	0	1 (5.9)	1 (5.9)
	College or university	7 (41.2)	5 (29.4))	12 (70.6)
Specialty (Multiple choice)	Ambulatory care	0	1	1
	Education	1	2	3
	Geriatrics	1	1	2
	Management	2	0	2
	Nursing informatics	1	0	1
	Medical-surgical	2	6	8
	Pediatrics	1	0	1
	Public health	1	1	2
	Specialty medicine	1	3	4
	Other	1	2	3
Position (Multiple choice)	Staff nurse	1	2	3
	Nurse practitioner	0	1	1
	Researcher	0	3	3
	Educator	7	4	11
	Quality assurance coordinator	0	1	1
Experience in SNL	Yes	7 (41.2)	3 (17.6)	10 (58.8)
	No	0	7 (41.2)	7 (41.2)

The number of respondents were in P5:7, P6:10 (1st round), and P5: 5, P6: 5 (2nd round).

Knowledge: Coronary Artery Disease Management

Definition Adequacy

Most respondents of Survey Set 3 evaluated that the definition of the outcome *Knowledge: Coronary Artery Disease Management* was quite adequate (mode=4) to explain this outcome (Table 29). However, the three means by each and both panels were slightly lower than 4.0. A few experts in both panels determined the definition was *slightly* or *moderately* adequate. There were several comments to improve the definition. One of specific suggestions was to describe etiology and risks about coronary artery disease in the definition. One expert asked to change the definition to *extent of understanding on coronary artery disease progress, contributing factors, relevant treatment, and the expected effects and complications.*

Table 29. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Coronary Artery Disease Management. (n=17)

Definition	Extent of understanding conveyed about coronary heart disease, its treatment, and the prevention of disease progression and complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
	Mode	Mean (SD)				
		Total (n=17)	Panel 5 (n=7)	Panel 6 (n=10)	*p*	
Definition adequacy	4	3.71 (.849)	3.86 (1.06)	3.60 (.699)	.475	
Clinical usefulness	4	4.12 (.857)	4.29 (1.11)	4.00 (.667)	.316	

Clinical Usefulness

The clinical usefulness of this outcome was identified as quite relevant (mode=4) to measure indicators using the measurement scale. The mean of clinical usefulness was

4.12 (SD=.857). The two means by both panels were 4.29 (SD=1.11) and 4.0 (SD=.667), and there was no significant difference (Table 29). The mean of clinical usefulness by P5 was higher than the mean by P6; however, a few experts in P5 evaluated this scale was *slightly* or *moderately* relevant for measuring the indicators in this outcome.

Outcome and Indicator Content Validity

There were 42 indicators to evaluate this outcome. Thirty of the 42 indicators were identified as critical, and 12 indicators were categorized as supplemental. There were no unnecessary indicators identified by the first round evaluation (Table 30). The most important indicator for this outcome was *Signs and symptoms of worsening disease* (1) with a .985 IR. However, 6 of the 42 indicators were rated as 'not at all important' for this outcome by a few experts in both panels in the first round: Indicators 25, 32, 34, 37, 41, and 42. The importance of this outcome was decided as a critical outcome (OCV=.850). The importance of this outcome by P5 was slightly higher than the OCV by P6 (OCV=.878; OCV=.830). The importance of 9 indicators differed between panels. The 9 indicators were ranked at 27^{th}, $31-37^{th}$, and 39^{th} in Table 30.

In the second round, the importance of 42 indicators was re-evaluated, and the number of experts in each panel was five. The experts in P5 had agreements about the importance of 22 indicators: 1−7, 9, 10, 14, 20, 22, 24−26, 28, 29, 32, 35, 36, 38, and 39. The experts in P6 had also agreements about the importance of 27 indicators in the second round (Table 30): Indicators 1−7, 9−15, 19, 21, 22, 24, 26, 28, 29, 32, 33, 35, 38, and 41. On the other hand, a few respondents of both panels disagreed with the importance of 12 indicators: 8, 16−18, 23, 27, 30, 31, 34, 37, 40, and 42. In addition, 9 indicators were considered as unnecessary for this outcome by one or two experts in each

panel: Indicators 13, 17, 22, 25, 28, 29, 36, 38, and 39. Indicator 25 (*Strategies to increase diet compliance*) was repeatedly rated as unnecessary in both rounds.

Table 30. Importance of the Outcome with Indicators in Knowledge: Coronary Artery Disease Management

Results of 1st and 2nd Rounds about Knowledge: Coronary Artery Disease Management							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P5	P6	P5	P6
1	Signs and symptoms of worsening disease	Critical	.985	-[a]	-	-	-
2	Benefits of disease management	Critical	.985	-	-	-	-
3	Importance of tobacco abstinence	Critical	.971	-	-	-	-
4	Strategies to reduce risk factors	Critical	.956	-	-	-	-
5	Signs and symptoms of early disease	Critical	.941	-	-	-	-
6	Medication therapeutic effects	Critical	.941	-	-	-	-
7	Medication schedule	Critical	.927	-	-	-	-
8	Guidelines for activity level	Critical	.927	20	20	-	-
9	When to obtain assistance from a health professional	Critical	.927	-	-	-	-
10	Medication side effects	Critical	.912	-	-	-	-
11	Cause and contributing factors	Critical	.897	-	-	-	-
12	Medication adverse effects	Critical	.897	20	-	-	-
13	Strategies to maintain optimal weight	Critical	.897	20	-	20	-
14	Strategies to prevent blood clots	Critical	.897	-	-	-	-
15	Methods to monitor blood pressure	Critical	.882	20	-	-	-
16	Methods to monitor heart rate	Critical	.882	20	20	-	-
17	Benefits of maintaining optimal weight	Critical	.882	20	20	20	-
18	Adverse health effects of stress on coronary artery disease	Critical	.882	20	40	-	-
19	Care options for assistance with medical emergencies	Critical	.882	20	-	-	-
20	Types of pain associated with disease	Critical	.868	-	20	-	-
21	Importance of completing cardiac rehabilitation	Critical	.868	40	-	-	-
22	Rationale for regular exercise	Critical	.868	-	-	20	-

Table 30 continued

23	Adverse health effects of anger on coronary artery disease	Critical	.868	20	60	-	-
24	Usual course of disease	Critical	.853	-	-	-	-
25	Strategies to increase diet compliance	Critical	.853	-	20	20	-
26	Importance of limiting sodium intake	Critical	.838	-	-	-	-
27	Guidelines for sexual activity +	Critical	.824	20	40	-	-
28	Strategies to manage stress	Critical	.824	-	-	20	-
29	Strategies to manage anger	Critical	.809	-	-	20	-
30	Reputable sources of cardiac disease information +	Critical	.809	20	20	-	-
31	Methods to monitor heart rhythm +	Supplemental	.794	20	80	-	-
32	Importance of periodic screening of cholesterol level +	Supplemental	.794	-	-	-	-
33	Importance of periodic screening of blood glucose level +	Supplemental	.779	20	-	-	-
34	Cultural influences on compliance to treatment regimen +	Supplemental	.779	20	20	-	-
35	Importance of alcohol restrictions +	Supplemental	.765	-	-	-	-
36	Family's role in treatment plan +	Supplemental	.750	-	20	20	-
37	Importance of obtaining pneumonia vaccine +	Supplemental	.735	20	20	-	-
38	Rationale for controlling blood glucose level	Supplemental	.735	-	-	20	-
39	Importance of family learning cardiopulmonary resuscitation +	Supplemental	.721	-	20	40	-
40	Available support groups	Supplemental	.706	20	20	-	-
41	Benefits of following a low-fat, low-cholesterol diet	Supplemental	.691	20	-	-	-
42	Importance of obtaining influenza seasonal vaccine	Supplemental	.691	20	20	-	-
	OCV score		.850				

The number of respondents were in P5:7, P6:10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Several comments were related to two indicators *Importance of periodic screening of cholesterol level* (32) and *Benefits of following a low-fat, low-cholesterol diet* (41). According to a few commenters, current studies report that low fat and

cholesterol diets are not linked to coronary artery disease. Patients should be taught to focus on low carbohydrate and low saturated fat diets instead of low fat or low cholesterol diets. The other comment was about medication. A respondent suggested that patients should know the right time for taking specific medications and interactions between drug and food.

Self-Management: Coronary Artery Disease

Definition Adequacy

The majority of respondents decided that the definition of the outcome *Self-Management: Coronary Artery Disease* was perfectly adequate (mode=5) to describe this outcome (Table 31). The mean by all the respondents was 4.0 (SD=.935), and the range of means by both panels was from 3.70 (SD=.675) to 4.43 (SD=1.13). The mean by P5 was higher than the mean by P6, and the difference was statistically significant (p=.070). Although the mean by P5 was higher, a few experts in this panel rated the definition was *slightly* adequate. On the other hand, all experts in P6 determined the definition was *moderately* or *quite* adequate. One of the comments for this outcome was similar to the suggestion for the outcome Knowledge: Coronary Artery Disease Management. The suggested definition was that personal actions to manage contributing factors to coronary artery disease progress, to comply with treatment and to prevent complications. The other suggestion for clarification was to change words from personal actions to *manage coronary artery disease to personal behaviors necessary for self-management of coronary artery disease*.

Clinical Usefulness

The clinical usefulness for the relevance of use of the measurement scale rated by the majority of respondents was very relevant (mode=5) to evaluate indicators (Table 31). The mean of clinical usefulness for the outcome *Self-Management: Coronary Artery Disease* was 4.18 (SD=1.13), and indicated that using this scale was *quite* relevant to evaluate the indicators. The two means by both panels were 4.43 (SD=1.13) and 4.0 (SD=1.15), respectively. Although all the means by the respondents were over 4.0, a few experts in both panels identified that this scale was *never* or *slightly* relevant for measuring the indicators.

Table 31. Means and Modes of Definition Adequacy, Clinical Usefulness, and Content Similarity of Self-Management: Coronary Artery Disease (n=17)

Definition	Personal actions to manage coronary artery disease, its treatment, and to prevent disease progression and complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 5	Panel 6	*p*	
Definition adequacy	5	4.00 (.935)	4.43 (1.13)	3.70 (.675)	.070	
Clinical usefulness	5	4.18 (1.13)	4.43 (1.13)	4.00 (1.15)	.230	
Similarity of Coronary Artery Disease pair	4	4.06 (.659)	4.29 (.488)	3.90 (.738)	.417	

Content Similarity

The indicators between the two outcomes *Knowledge: Coronary Artery Disease Management* and *Self-Management: Coronary Artery Disease* were considered as mostly matched (mode=4) by the majority of respondents in Survey Set 3 (Table 31). The mean

of the content similarity was 4.06 (SD=.659) evaluated by all the respondents. The two means by both panels were 4.29 (SD=.488) and 3.90 (SD=.738), and there was no significant difference (Table 30). All the experts in P5 determined that the content in the outcomes was *mostly* or *perfectly* matched while few experts in P6 identified the content was *slightly* or *partially* matched.

Outcome and Indicator Content Validity

This outcome *Self-Management: Coronary Artery Disease* contains 43 indicators and they were rated to identify their importance. Among the 43 indicators, 38 indicators were evaluated as critical, and the remaining 5 indicators were identified as supplemental for this outcome in the first round (Table 32). Although ratios of all the indicators were greater than .70, nine indicators were rated as 'not at all important' for this outcome by a few experts: Indicators 20, 22, 28, 32, 33, 34, 37, 38, and 42. On the other hand, the most important indicator was *Reports symptoms of worsening disease* (1) with a perfect ratio. The importance of this outcome was designated as critical (OCV=.873), and the two OCV scores by each panel were greater than .80. The importance of 11 indicators was differently evaluated by both panels: Indicators 26, 28, 32, 34−40, and 42 (see Appendix D: Table D-10).

In the second round, the importance of 43 indicators was re-evaluated to confirm the results from the first round. The experts in P5 did not reach agreements about 11 indicators: 17, 24, 30, 31, 35, 36, 39, 40, 41, 42, and 43. On the other hand, the experts in P6 agreed with the results of 18 indicators: 1, 2, 5, 6, 11, 12, 14−21, 25, 29, 30, and 38. Two to three respondents of both panels disagreed with the results of 4 indicators (24, 31, 35, and 36) as not critical but supplemental. Two to four experts of both panels also

disagreed with the results of 5 indicators (39, 40, 41, 42, and 43) as not supplemental but critical. Additionally, a few respondents of both panels considered that 6 indicators were not necessary for this outcome: Indicators 21, 25, 30, 33, 35, and 38. The two indicators *Accepts diagnosis* (33) and *Adapts life routine for optimal health* (38) were rated as not important indicators in both rounds.

Table 32. Importance of the Outcome with Indicators in Self-Management: Coronary Artery Disease

Results of 1st and 2nd Rounds about Self-Management: Coronary Artery Disease							
		1st Round		2nd Round			
				Percent of			
Rank order	Indicators	Criteria	IR	Disagree		Discard	
				P5	P6	P5	P6
1	Reports symptoms of worsening disease	Critical	1.00	-[a]	-	-	-
2	Uses medication as prescribed	Critical	.985	-	-	-	-
3	Monitors symptom persistence	Critical	.956	-	20	-	-
4	Monitors symptom frequency	Critical	.956	-	20	-	-
5	Uses preventive strategies to reduce risk of complications	Critical	.956	-	-	-	-
6	Eliminates tobacco use	Critical	.956	-	-	-	-
7	Keeps appointments with health professional	Critical	.956	-	20	-	-
8	Maintains plan for medical emergencies	Critical	.956	-	20	-	-
9	Monitors symptom onset	Critical	.941	-	20	-	-
10	Monitors symptom severity	Critical	.941	-	20	-	-
11	Monitors for shortness of breath	Critical	.927	-	-	-	-
12	Obtains health care for change in symptoms	Critical	.927	-	-	-	-
13	Monitors medication therapeutic effects	Critical	.927	-	20	-	-
14	Performs treatment regimen as prescribed	Critical	.912	-	-	-	-
15	Monitors for pain	Critical	.912	-	-	-	-
16	Monitors medication side effects	Critical	.912	-	-	-	-
17	Participates in recommended exercise	Critical	.912	20	-	-	-

Table 32 continued

18	Participates in prescribed cardiac rehabilitation	Critical	.897	-	-	-	-
19	Uses symptom relief methods	Critical	.897	-	-	-	-
20	Avoids stopping medication suddenly	Critical	.897	-	-	-	-
21	Uses stress management strategies	Critical	.882	-	-	20	-
22	Participates in screening for cholesterol	Critical	.868	-	40	-	-
23	Participates in health care decisions	Critical	.853	-	20	-	-
24	Follows prescribed diet	Critical	.853	20	20	-	-
25	Uses effective weight control strategies	Critical	.853	-	-	20	-
26	Seeks information about methods to manage disease +	Critical	.838	-	40	-	-
27	Monitors blood pressure	Critical	.838	-	20	-	-
28	Monitors effects of stimulants +	Critical	.838	-	20	-	-
29	Follows recommendations for alcohol use	Critical	.838	-	-	-	-
30	Uses anger management techniques	Critical	.838	20	-	20	-
31	Participates in screening for blood glucose level	Critical	.838	20	40	-	-
32	Uses health care services congruent with needs +	Critical	.824	-	20	-	-
33	Accepts diagnosis	Critical	.809	-	20	20	-
34	Uses only nonprescription medication approved by health professional +	Critical	.809	-	20	-	-
35	Maintains optimum weight +	Critical	.809	20	20	20	-
36	Follows recommendations for sexual activity +	Critical	.809	20	40	-	-
37	Obtains pneumonia vaccine +	Critical	.809	-	40	-	-
38	Adapts life routine for optimal health +	Critical	.809	-	-	20	-
39	Monitors heart rate and rhythm +	Supplemental	.794	20	20	-	-
40	Uses diary to monitor symptoms over time +	Supplemental	.779	20	40	-	-
41	Avoids second hand smoke	Supplemental	.765	40	40	-	-
42	Obtains influenza seasonal vaccine +	Supplemental	.765	20	20	-	-
43	Uses social support	Supplemental	.706	20	20	-	-
	OCV score		.873				

The number of respondents were in P5:7, P6:10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.

a zero (0) percent of disagree/discard
IR Indicator Ratio

There were several comments for this outcome. One of comments was about Indicator 34 (*Uses only nonprescription medication approved by health professional*). A revision of this indicator was asked to *uses nonprescription medication only as approved by health professional* because this indicator is vague to understand. An additional comment was related to Indicator 22 (*Participates in screening for cholesterol*). Total cholesterol is not enough to be a good risk factor of heart diseases, but TG, LDL, and HDL are more important than total cholesterol clinically. Thus, these three lab results should be considered as an indicator for this outcome. The other comment was that few indicators express multiple definitions: optimum weight (Indicator 35) and optimal health (Indicator 38). Revisions of these indicators were asked to make them clear by commenters.

Knowledge: Lipid Disorder Management

Definition Adequacy

The majority of the raters indicated that the definition of the outcome *Knowledge: Lipid Disorder Management* was quite adequate (mode=4) to explain this outcome (Table 33). The mean of definition adequacy by all the respondents was 3.88 (SD=.857). The two means by both panels were 4.14 (SD=1.06) and 3.70 (SD=.675). The mean by P5 was higher, but there was no a significant difference (p=.230). Some experts in both panels considered that the definition was *slightly* or *moderately* adequate to describe this outcome. One suggested definition was that extent of understanding about

hyperlipidemia progress, contributing factors, relevant treatment, therapeutic effects, and complications.

Table 33. Means and Modes of Definition Adequacy and Clinical Usefulness of Knowledge: Lipid Disorder Management (n=17)

Definition	Extent of understanding conveyed about hyperlipidemia, its treatment, and the prevention of complications					
Measurement scale	No knowledge 1	Limited knowledge 2	Moderate knowledge 3	Substantial knowledge 4	Extensive knowledge 5	NA
	Mode	Mean (SD)				
		Total	Panel 5	Panel 6	*p*	
Definition adequacy	4	3.88 (.857)	4.14 (1.06)	3.70 (.675)	.230	
Clinical usefulness	5	4.29 (.849)	4.29 (1.11)	4.30 (.675)	.740	

Clinical Usefulness

The mean of clinical usefulness of this outcome evaluated by all the respondents was 4.29 (SD=.849). The two means by both panels were similar to each other: 4.29 (SD=1.11) and 4.30 (SD=.675, Table 33). Most raters determined that the measurement scale was *very* relevant (mode=5) to evaluate indicators, but only one expert in P5 thought this scale was *slightly* relevant.

Outcome and Indicator Content Validity

A total of 21 indicators were rated by respondents to build the content validity of the outcome *Knowledge: Lipid Disorder Management.* In this outcome, 19 of the 21 indicators were evaluated as critical, and 2 indicators were designated as supplemental (Table 34). In the first round, the most important indicator was *Strategies to change dietary habits* (1) with a perfect ratio. However, 5 of the 21 indicators were rated as ‘not

at all important' for this outcome by few experts: Indicators 13, 14, 17, 18, and 20. The importance of this outcome was identified as critical (OCV=.904). The OCV score by P5 was slightly higher than P6 (OCV=.917; OCV=.895). The importance of one indicator differed between panels: *Recommendations for alcohol use* (20). This indicator was evaluated as critical by P6 but supplemental by P5.

In the second round, P5 had agreements about the importance of 15 indicators: 1, 2, 4, 5, 9−12, 14-16, 18, 19, and 20. The experts of P6 reached agreements about the importance of 13 indicators: 1−4, 6−9, 11, 12, 15, 18, and 20. In contrast, one or two respondents in each panel disagreed with the importance of 3 indicators: 13, 17, and 21. In the second round, there were no indicators rated as unnecessary for this outcome (Table 34).

One specific comment for this outcome was related to the indicator *Benefits of aerobic exercise* (13). Current research in exercise shows that all types of exercise are beneficial for heart diseases to decrease lipid levels and blood pressures.

Table 34. Importance of the Outcome with Indicators in Knowledge: Lipid Disorder Management

Results of 1st and 2nd Rounds about Knowledge: Lipid Disorder Management							
		1st Round		2nd Round			
				Percent of			
Rank order	Indicators	Criteria	IR	Disagree		Discard	
				P5	P6	P5	P6
1	Strategies to change dietary habits	Critical	1.00	-[a]	-	-	-
2	Benefits of hyperlipidemia management	Critical	.985	-	-	-	-
3	Benefits of weight loss	Critical	.971	20	-	-	-
4	Correct use of prescribed medication	Critical	.971	-	-	-	-
5	Importance of adherence to treatment	Critical	.971	-	20	-	-

Table 34 continued

6	Benefits of lifestyle modifications	Critical	.956	-	-	-	-
7	Prescribed diet	Critical	.927	20	-	-	-
8	Medication adverse effects	Critical	.927	20	-	-	-
9	Medication side effects	Critical	.912	-	-	-	-
10	Cause and contributing factors	Critical	.897	-	20	-	-
11	Required laboratory tests for monitoring lipid levels	Critical	.897	-	-	-	-
12	Target lipid levels	Critical	.897	-	-	-	-
13	Benefits of aerobic exercise	Critical	.897	20	20	-	-
14	Potential medication interactions with food	Critical	.897	-	20	-	-
15	Medication therapeutic effects	Critical	.897	-	-	-	-
16	When to obtain assistance from a health professional	Critical	.897	-	20	-	-
17	Signs and symptoms of complications	Critical	.882	20	40	-	-
18	Importance of tobacco abstinence	Critical	.882	-	-	-	-
19	Reputable sources of hyperlipidemia information	Critical	.868	-	20	-	-
20	Recommendations for alcohol use +	Supplemental	.765	-	-	-	-
21	Available support groups	Supplemental	.691	20	20	-	-
	OCV score		.904				

The number of respondents were in P5:7, P6:10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Self-Management: Lipid Disorder

Definition Adequacy

The mean of definition adequacy for the outcome *Self-Management: Lipid Disorder* identified by all the respondents was 4.29 (SD=.920). The two means by both panels were similar to, and there was not a statistical difference: 4.43 (SD=1.13) and 4.20 (SD=.789) (Table 35). Most raters in Survey Set 3 decided that the definition adequacy was perfectly adequate (mode=5); however, a few raters evaluated it was *slightly* or

moderately adequate. Specific comments for clarification of the definition were to add the word *prevention* before treatment, and to revise the definition as follow: personal actions to manage contributing factors to hyperlipidemia progress, to comply with treatment, and to prevent complications.

Clinical Usefulness

The relevance of use of the measurement scale was identified as quite relevant (mode=4) to measure indicators (Table 35). The mean of clinical usefulness for this outcome evaluated by all the respondents was 4.06 (SD=1.14). The two means by both panels were 4.29 (SD=1.11) and 3.90 (SD=1.19), and there was no a significant difference (p=.417). A few experts in both panels identified that this scale was *never* or *slightly* relevant to measure the indicators.

Table 35. Means and Modes of Definition Adequacy, Clinical Usefulness, and Content Similarity of Self-Management: Lipid Disorder (n=17)

Definition	Personal actions to manage hyperlipidemia, its treatment, and to prevent complications					
Measurement scale	Never demonstrated 1	Rarely demonstrated 2	Sometimes demonstrated 3	Often demonstrated 4	Consistently demonstrated 5	NA
	Mode	Mean (SD) Total	Panel 5	Panel 6	*p*	
Definition adequacy	5	4.29 (.920)	4.43 (1.13)	4.20 (.789)	.417	
Clinical usefulness	5	4.06 (1.14)	4.29 (1.11)	3.90 (1.19)	.417	
Similarity of Lipid Disorder pair	4	4.35 (.606)	4.43 (.535)	4.30 (.675)	.813	

Content Similarity

The final pair of the outcomes for the content similarity was *Knowledge: Lipid Disorder Management* and *Self-Management: Lipid Disorder*. Most raters evaluated the content similarity between these two NOC outcomes was mostly matched (mode=4, Table 35). The mean of the content similarity by all the respondents was 4.35 (SD=.606). The two means by both panels were 4.43 (SD=.535) and 4.30 (SD=.675). Most raters identified the content similarity of this pair was *mostly* or *perfectly* matched; however, a few experts in P6 determined it was *partially* matched.

Outcome and Indicator Content Validity

The respondents evaluated a total of 25 indicators in this outcome. Twenty-four of the 25 indicators were identified as critical, and one indicator was evaluated as supplemental (Table 36). In the first round, the most important indicator was *Adapts life routine for optimal health* (1) with a .971 IR. However, a few experts considered 6 of the 25 indicators were 'not at all important' for this outcome in the first round. These 6 indicators were ranked at 14th, 16th, 19th, 20th, 23rd, and 24th in Table 36. The importance of this outcome was decided as critical (OCV=.888), and the two OCV scores by both panels were similar to each other (OCV=.881; OCV=.893). The importance of 6 indicators was evaluated differently by panels: Indicators 14, 16, 19, 20, 23, and 24. These 6 indicators are the same indicators rated as 'not at all important' for this outcome.

In the second round, the importance of 25 indicators was re-evaluated. The experts of P5 did not have agreements about the importance of 4 indicators: 13, 14, 21, and 25. They agreed with the results of other 21 indicators. In contrast, the experts in P6

agreed with the results of 11 indicators: 1, 4, 6, 14, 15, 16, 19, 20, 22, 23, and 24. For 3 indicators, two to four experts of both panels disagreed with the importance: Indicators 13, 21, and 25 (Table 36). Additionally, 6 indicators were considered as unnecessary for this outcome by an expert in the second round. The indicator *Maintains optimum weight* (14) was repeatedly rated as unnecessary in both rounds.

A few comments by experts were raised. One of comments was related to two indicators *Monitors medication adverse effects* (19) and *Monitors medication side effects* (23). A commenter stated that it would be difficult to distinguish between medication adverse effects and side effects. The other comment was that some fats are good for healthy; thus, the indicator *Limits fat and cholesterol intake* (5) should be revised. Similarly, the indicator *Participates in recommended aerobic exercise* (15) was asked to be revised because all types of exercise would have a good impact on healthy lifestyles. Updating references related to lipid disorder also was requested.

Table 36. Importance of the Outcome with Indicators in Self-Management: Lipid Disorder

Results of 1st and 2nd Rounds about Self-Management: Lipid Disorder							
		1st Round		2nd Round			
Rank order	Indicators	Criteria	IR	Percent of Disagree		Discard	
				P5	P6	P5	P6
1	Adapts life routine for optimal health	Critical	.971	-[a]	-	20	-
2	Monitors medication therapeutic effects	Critical	.971	-	20	-	-
3	Uses significant others to support behavior changes	Critical	.971	-	40	20	-
4	Obtains required laboratory tests	Critical	.956	-	-	-	-
5	Limits fat and cholesterol intake	Critical	.956	-	20	-	-
6	Follows recommendations for alcohol use	Critical	.956	-	-	-	-

Table 36 continued

7	Participates in health care decisions	Critical	.941	-	20	-	-
8	Uses only nonprescription medication approved by health professional	Critical	.941	-	20	-	-
9	Uses health care services congruent with needs	Critical	.941	-	20	-	-
10	Monitors lipid levels	Critical	.927	-	20	-	-
11	Monitors changes in general health	Critical	.912	-	40	20	-
12	Keeps appointments with health professional	Critical	.912	-	20	-	-
13	Discusses benefits of medication with health professional	Critical	.882	20	20	-	-
14	Maintains optimum weight +	Critical	.882	20	-	20	-
15	Participates in recommended aerobic exercise	Critical	.882	-	-	20	-
16	Eliminates tobacco use +	Critical	.868	-	-	-	-
17	Seeks information about methods to manage disorder	Critical	.838	-	20	-	-
18	Uses effective weight control strategies	Critical	.838	-	20	20	-
19	Monitors medication adverse effects +	Critical	.838	-	-	-	-
20	Follows recommended diet +	Critical	.824	-	-	-	-
21	Uses available community resources	Critical	.824	40	40	-	-
22	Uses medication as prescribed	Critical	.809	-	-	-	-
23	Monitors medication side effects +	Critical	.809	-	-	-	-
24	Avoids stopping medication suddenly +	Critical	.809	-	-	-	-
25	Avoids second hand smoke	Supplemental	.750	20	20	-	-
	OCV score		.888				

The number of respondents were in P5:7, P6:10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard
IR Indicator Ratio

Analysis of Respondent Comments

Respondent comments for outcome definitions, measurement scales, indicators, and content similarity of the 12 NOC outcomes were collected from first and second round surveys. A total of 131 and 4 comments were collected from both rounds, respectively. Four comments from the second round overlapped with the general comments from the first round. General comments from both rounds are described in this final section by specific aims. Specific comments for each definition, measurement scale, and indicator are reported with corresponding outcomes in the second section.

General Comments for Definitions

A total of 13 respondents made 35 comments about the definition adequacy of the 12 NOC outcomes. Most repeated comments were that using easy and plain words in the definition will help users who are nursing students, new nurses, or the public understand NOC outcomes accurately when they use them in clinical settings. Other comments were separated in the two categories: the knowledge outcomes and the self-management outcomes. For the definition of knowledge outcomes, many experts asked to delete a word *conveyed* from each definition because the word *conveyed* made users confused and made the definitions unclear. The other comment was that extent of understanding equates to actual level of knowledge. Because of these two different meanings, the recommendation was to revise the definition.

For the definition of self-management outcomes, an expert suggested that it would be better for the definition of self-management outcomes to describe the domain of personal actions such as psychomotor, cognitive, behavioral, or decision making to

improve clarity of the definition. The other frequent comments were to change the word *manage* to *make response* because people cannot manage a disease itself but manage their health conditions related to the disease.

General Comments for Measurement Scales

Among the 46 respondents, 12 experts offered 39 comments about clinical usefulness of measurement scales. There were no comments for the specific outcomes. Some commenters expressed that using a 5-point scale is difficult in various clinical settings. For the measurement scales of the knowledge outcomes, most commenters mentioned that it is hard to distinguish between substantial and extensive knowledge. Some respondents asked that instead of the 5-point scale, using 2 (known-unknown) or 3 (none-some-sufficient known) choices would be better for the knowledge outcomes.

Similarly, the respondents commented that the measurement scales of the self-management outcomes are not appropriate. They suggested that the self-management outcomes should be reported by patients and the measurement scales need to be changed as patient-focused scales. For the self-management outcomes, some respondents asked that using percentages or a 2-choice scale (doing-not doing) by patients could be more appropriate to measure self-management activities.

General Comments for Indicators

There were 59 comments to improve outcome indicators, and some comments for a specific outcome and indicators are reported in the second section. The most repeated comments for both knowledge and self-management outcomes were about the number of indicators in each outcome. Respondents expressed that there were duplicate

indicators to measure the outcome in some outcomes including over 40 indicators specifically. They recommended deleting the redundant indicators to use NOC outcomes effectively. Also, commenters repeatedly asked to update references. Some indicators measure old recommendations or guidelines, and these indicators are not appropriate to apply to current patients. The experts asked to reflect results of current research about chronic diseases on indicators.

For indicators in the knowledge outcomes, some respondents asked to revise some indicators because these indicators measure behaviors rather than knowledge.

Several recommendations were commented for the self-management outcomes. One of them was to use patient-centered terms instead of provider-centered terms such as *prescribed, follow*, and *adjust*. The respondents expressed that self-management is really patient-driven activities; thus, indicators should be described with patient-focused terms (e.g., set goals with health care providers and agree with care plans). Similarly, the other suggestion was related to the terms of *prescription* and *prescribed*. Because these words are more of a medical management approach, using patient-focused words was recommended for nursing care. An additional comment was related to the indicator *Accept diagnosis* because respondents considered this indicator is not measured as behaviors for self-management. Thus, they asked to delete or revise this indicator. The other comment was about the indicator *Uses social support/group*. Respondents considered that depending on individual circumstances, this indicator would be important or not. They commented this indicator is debatable to identify as necessary.

General Comments for Content Similarity

Two respondents made two comments for the content similarity. The commenters asked to match up with the order of indicator content in both knowledge and self-management outcomes to figure out content in the two outcomes clearly.

Summary by Specific Aims

All data from both round surveys were analyzed to verify the five specific aims, and the results are described in this chapter. A total of 46 experts participated in the first round survey, and 27 of them responded to the second round survey. All the respondents had at least a master's degree in nursing. Descriptive statistical analyses were used to examine the results of specific aims 1, 3, and 4: definition adequacy, clinical usefulness, and content similarity. For specific aim 2, the OCV method was used to evaluate the importance of the outcome with its indicators. To confirm the different perspectives between both expert categories, Mann-Whitney U-tests were used with a .10 significance level. In the second round, the data for the specific aim 2 were collected and evaluated using descriptive statistical analyses to confirm the results from the first round.

The definition adequacy of the 12 NOC outcomes was evaluated as quite adequate to capture and describe the essence of the outcome, and there were no significantly different perspectives between both expert categories except for the three outcomes: *Knowledge: Hypertension Management, Self-Management: Hypertension,* and *Self-Management: Coronary Artery Disease* (Table 37).

Table 37. Means of Definition Adequacy of the 12 NOC Outcomes

Set	Outcome label	Mean (SD)			
		Total	P1	P2	*p*
1	Knowledge: Chronic Disease Management	4.06 (.680)	4.14 (1.06)	4.00 (0)	.351
	Self-Management: Chronic Disease	4.19 (.834)	3.86 (1.06)	4.44 (.527)	.299
	Knowledge: Diabetes Management	4.00 (.730)	3.71 (.951)	4.22 (.441)	.351
	Self-Management: Diabetes	4.19 (.834)	3.86 (1.06)	4.44 (.527)	.299
			P3	P4	
2	Knowledge: Cardiac Disease Management	4.00 (.577)	4.00 (.707)	4.00 (.535)	-
	Self-Management: Cardiac Disease	3.85 (.987)	4.20 (.837)	3.63 (1.06)	.435
	Knowledge: Hypertension Management	4.23 (.725)	4.80 (.447)	3.88 (.641)	.030
	Self-Management: Hypertension	4.00 (.816)	4.60 (.548)	3.63 (.744)	.045
			P5	P6	
3	Knowledge: Coronary Artery Disease Management	3.71 (.849)	3.86 (1.06)	3.60 (.699)	.475
	Self-Management: Coronary Artery Disease	4.00 (.935)	4.43 (1.13)	3.70 (.675)	.070
	Knowledge: Lipid Disorder Management	3.88 (.857)	4.14 (1.06)	3.70 (.675)	.230
	Self-Management: Lipid Disorder	4.29 (.920)	4.43 (1.13)	4.20 (.789)	.417

The numbers of respondents were P1:7, P2:9, P3:5, P4:8, P5:7, and P6:10.

Content validity of the 12 NOC outcomes were established using OCV scores of the outcomes and ratios of indicators. All the outcomes were identified as critical based on OCV scores. More than 80% of indicators were evaluated as critical in half of the outcomes in the first round: *Knowledge: Diabetes Management, Self-Management: Diabetes, Knowledge: Hypertension Management, Self-Management: Coronary Artery Disease, Knowledge: Lipid Disorder Management,* and *Self-Management: Lipid Disorder* (Table 38). More than 20% of indicators in the five NOC outcomes were considered as

unnecessary by a few experts in the second round: *Self-Management: Chronic Disease, Knowledge: Cardiac Disease Management, Self-Management: Hypertension, Knowledge: Coronary Artery Disease Management*, and *Self-Management: Lipid Disorder*.

Table 38. OCV Scores and the Number of Indicators of the 12 NOC Outcomes

Set	Outcome Label	OCV score	# of Ind	# of CI	# of SI
1	Knowledge: Chronic Disease Management	.882	30	22	8
	Self-Management: Chronic Disease	.867	51	36	14
	Knowledge: Diabetes Management	.951	36	35	1
	Self-Management: Diabetes	.904	44	38	6
2	Knowledge: Cardiac Disease Management	.876	36	25	11
	Self-Management: Cardiac Disease	.840	45	35	10
	Knowledge: Hypertension Management	.889	31	29	2
	Self-Management: Hypertension	.817	33	21	12
3	Knowledge: Coronary Artery Disease Management	.878	42	30	12
	Self-Management: Coronary Artery Disease	.893	43	38	5
	Knowledge: Lipid Disorder Management	.917	21	19	2
	Self-Management: Lipid Disorder	.881	25	24	1

The numbers of respondents were Set 1: 16, Set 2: 13, and Set 3: 17.
Ind Indicator
CI Critical Indicator
SI Supplemental Indicator

The clinical usefulness of the 12 NOC outcomes was evaluated as quite relevant to use the measurement scales in clinical settings, and there were no significantly different perspectives between both expert categories (Table 39).

Table 39. Means of Clinical Usefulness of the 12 NOC Outcomes

Set	Outcome Label	Mean (SD)			
		Total	P1	P2	*p*
1	Knowledge: Chronic Disease Management	4.13 (.719)	4.29 (.756)	4.00 (.707)	.470
	Self-Management: Chronic Disease	4.25 (.856)	4.00 (1.15)	4.44 (.527)	.606
	Knowledge: Diabetes Management	4.25 (.931)	4.00 (1.15)	4.44 (.726)	.536
	Self-Management: Diabetes	4.25 (.856)	3.86 (1.06)	4.56 (.527)	.210
			P3	P4	
2	Knowledge: Cardiac Disease Management	3.92 (1.15)	4.60 (.548)	3.50 (1.19)	.127
	Self-Management: Cardiac Disease	3.77 (1.23)	4.40 (.894)	3.38 (1.30)	.171
	Knowledge: Hypertension Management	4.00 (.108)	4.60 (.894)	3.63 (1.06)	.127
	Self-Management: Hypertension	4.15 (.899)	4.40 (.894)	4.00 (.926)	.524
			P5	P6	
3	Knowledge: Coronary Artery Disease Management	4.12 (.857)	4.29 (1.11)	4.00 (.667)	.316
	Self-Management: Coronary Artery Disease	4.18 (1.13)	4.43 (1.13)	4.00 (1.15)	.230
	Knowledge: Lipid Disorder Management	4.29 (.849)	4.29 (1.11)	4.30 (.675)	.740
	Self-Management: Lipid Disorder	4.06 (1.14)	4.29 (1.11)	3.90 (1.19)	.417

The numbers of respondents in P1:7, P2:9, P3:5, P4:8, P5:7, and P6:10.

The content similarity of 6 pairs of the NOC outcomes was evaluated that content of indicators in the pair were mostly matched each other, and there were no significantly different perspectives between both expert categories except for the one pair: *Knowledge: Cardiac Disease Management* and *Self-Management: Cardiac Disease* (Table 40).

Table 40. Means of Content Similarity of the 6 Pairs of NOC Outcomes

Set	Pair	Outcome Label	Mean (SD)			
			Total	P1	P2	*p*
1	1	Knowledge: Chronic Disease Management Self-Management: Chronic Disease	3.88 (.719)	4.00 (0)	3.78 (.972)	.758
	2	Knowledge: Diabetes Management Self-Management: Diabetes	4.00 (.516)	4.14 (.378)	3.89 (.601)	.470
				P3	P4	
2	3	Knowledge: Cardiac Disease Management Self-Management: Cardiac Disease	4.08 (.76)	4.80 (.447)	3.63 (.518)	.006
	4	Knowledge: Hypertension Management Self-Management: Hypertension	4.08 (.641)	4.20 (.837)	4.00 (.535)	.622
				P5	P6	
3	5	Knowledge: Coronary Artery Disease Management Self-Management: Coronary Artery Disease	4.06 (.659)	4.29 (.488)	3.90 (.738)	.417
	6	Knowledge: Lipid Disorder Management Self-Management: Lipid Disorder	4.35 (.606)	4.43 (.535)	4.30 (.675)	.813

The numbers of respondents in P1:7, P2:9, P3:5, P4:8, P5:7, and P6:10.

In this chapter, the respondents, the results of specific aims, and comments were analyzed and described. Discussions about the results of this study by specific aims, implications, and study limitations are described in Chapter V.

CHAPTER V

DISCUSSION AND CONCLUSION

The purpose of this descriptive exploratory study was to validate 12 nursing-sensitive patient outcomes (NOC). These 12 NOC outcomes were selected from the latest edition of NOC, and focused on knowledge and self-management for adults with CVDs and diabetes. The 12 NOC outcomes were *Knowledge: Chronic Disease Management; Self-Management: Chronic Disease; Knowledge: Diabetes Management; Self-Management: Diabetes; Knowledge: Cardiac Disease Management; Self-Management: Cardiac Disease; Knowledge: Hypertension Management; Self-Management: Hypertension; Knowledge: Coronary Artery Disease Management; Self-Management: Coronary Artery Disease; Knowledge: Lipid Disorder Management;* and *Self-Management: Lipid Disorder.* This study was conducted using an electronic survey design to investigate definition adequacy, content validity (importance of the outcome and its indicators), clinical usefulness, and content similarity.

Overview of Study Findings

The 12 NOC outcomes were validated using the Delphi technique by the two expert categories. The experts in the first category had expertise in SNL, and they were invited from two organizations: NANDA-I and CNC. The experts in the second category had expertise in self-management, and they were invited from the two RIGs related to self-management in MNRS. A total of 46 experts participated in the first round survey, and 27 of the 46 experts responded to the second round survey.

The Number of Respondents

In this study, there were six panel groups to validate the 12 NOC outcomes. Panels 1, 3, and 5 were in category 1 as experts in SNL. Panels 2, 4, and 6 were in category 2 as experts in self-management for chronic diseases. In the first round, a total of 46 experts participated in this study, and the number of experts in each panel was from 5 to 10. In the second round, the respondents in the first round were only invited, and the number of respondents in each panel was from 4 to 5. For a validation study, there are no standard rules for sample size. Some scholars in validation recommend that a number of experts from 5 to 10 would provide sufficient judgments and chances of agreement (Lynn, 1986; Polit & Beck, 2006). If it would be hard to invite many content/domain experts, a minimum of three experts should be used (Lynn, 1986). The number of respondents in this study satisfied the recommendation for a validation study, and there were sufficient judgments about the NOC outcomes from the respondents.

Level of Respondent Expertise

In this study, the level of respondent expertise played a more important role in validation of the NOC outcomes rather than the number of respondents and a response rate. A previous study focused on the validation of NOC outcomes for community health nursing (Head et al., 2004) reported that one of the study limitations was related to the level of expertise in the research topic. The research team recommended further studies to include experts who have a master's degree in the specialty, and have experiences in SNL development. To obtain valuable judgments from respondents, this study recruited potential respondents from the two expert categories, and applied Fehring's validation model expert rating system after applying modifications to adapt for this study (see Table

4). Indeed, there were eight respondents (17%) without experience in using SNL. However, all of them were in category 2 which was the self-management expert group, and it was an expected limitation. Based on Fehring's recommended level, 33 respondents (72%) met this recommendation. Although 28% of the respondents did not reach Fehring's recommended level, all of them had a master's degree in nursing. The investigator considered that this level of expertise would be enough to evaluate NOC outcomes based on the recommendation from Head's study (2004). Every respondent understood the purposes of this study, and completed the survey. Their judgments were valuable to obtain the results of the specific aims in this study.

Specific Aim 1: Definition Adequacy

Definition adequacy was validated to evaluate whether each definition captured the essence of the outcome, and was clear for users to understand the outcome. All the definitions were evaluated as quite adequate: the range of means was from 3.71 to 4.29 (see Table 37). Regardless of the Survey Sets, the eight means of definition adequacy by C2 were lower than the means by C1, and the comments about definition adequacy were suggested from the panel which had the lower mean. For example, the three means by C1 were lower than the means by C2 in Survey Set 1, and only the respondents in C1 commented about definition adequacy. Interestingly, the outcome *Knowledge: Coronary Artery Disease Management* had the lowest mean by the respondents, and received the most comments.

The comments from both expert categories were similar to one another, and they dealt with linguistic issues. Using easy and plain words, deleting the word *conveyed*, and changing the words *extent of understanding* to *level of understanding* in the definitions of

knowledge outcomes, and clarifying personal action in definitions of self-management outcomes were recommended. A lack of clarity in definitions would lead to misuses by unexperienced users such as nursing students, new nurses, and the public. The NOC research team was asked to apply these recommendations from the respondents to improve linguistic accuracy in definitions of NOC outcomes.

Historically, there were several validation studies about NOC; however, they did not research the level of definitions whether it is adequate to capture and describe essences of an outcome. An adequacy of outcome definition is very important because a definition is the foundation of an outcome. Also, outcome definitions would be used by most users when selecting NOC outcomes for their care plans. This study provides the level of definition adequacy of the 12 NOC outcomes. The results are valuable, and would help users understand and apply the NOC outcomes.

Specific Aim 2: Content Validity

Content validity was validated to evaluate whether the indicators of each outcome were important to measure the outcome. A total of 437 indicators were evaluated, and 80% of indicators (352/437) were categorized in the critical level in the first round. Only one indicator did not meet the study criteria (see Appendix D: Table D-2). The OCV scores were calculated for each outcome based on the indicator ratios, and all of them were identified as critical outcomes with over .80 OCV scores (see Table 38).

Usually, indicators related to understanding and monitoring/reporting worsening signs, symptoms, and complications were top ranked in each outcome. In cases of the three outcomes: Knowledge: Diabetes Management, Self-Management: Diabetes, and

Knowledge: Lipid Disorder Management, the most important indicators of these outcomes measured specific knowledge and behaviors such as using insulin, reporting non-healing breaks in skin, and changing diet habits. Nurse experts believed that these knowledge and behaviors were very significant to measure patient outcomes; thus, nurses need to consider this information when they educate patients with CVD or diabetes.

In the second round, 17% of the indicators (73/436) were rated as unnecessary for the outcome, and 68% of them (50/73) were in the self-management outcomes. One of the possible reasons for the increasing rate of unnecessary indicators was that the respondents directly selected a 'discard this indicator' option in the second round. In the first round, the importance of the indicators was evaluated based on their ratios, and the ratios were calculated by overall ratings of all the respondents.

Additionally, it would have been related to the number of indicators in the self-management outcomes (see Table 38). Based on the comments about content validity, some respondents mentioned that there were duplicated indicators (e.g., *Medication adverse effects* and *Medication side effects*). Thus, some respondents could have selected an indicator as an unnecessary indicator among indicators which had similar content.

Using content that has changed in the last few years in indicators also was a possible reason for the increasing rate of unnecessary indicators (e.g., O*btains influenza and pneumonia vaccines*, *Limits fat and cholesterol intake*, and *Participates in recommended aerobic exercise*). The commenters explained that only two kinds of vaccines are not enough to prevent diseases, and influenza and pneumonia vaccines are not significantly related to CVDs according to current research. The commenters also indicated that there are good fats for health; thus, limitation of fat and cholesterol intake

is not needed without any conditions. Likewise, all types of exercise are recommended rather than only aerobic exercise.

Some indicators which expressed general health information were rated as unnecessary (e.g., *Adapts life routine for optimal health, Avoids behaviors that potentiate disease progression, Performs usual life routine, Uses support group,* and *Uses available community resources*). These indicators were not focused on a specific disease or condition. In this case, the respondents could have considered that the importance of those indicators was not clear for the outcome.

Some respondents also selected the discard option for few indicators which were not evaluated in daily living by patients (e.g., *Correct procedure for urine ketone testing,* and *Monitors urinary glucose and ketones*). The commenters stated that self-management should be related to patients' daily living to manage their health conditions by themselves. The foregoing indicators were related to laboratory tests in clinical settings rather than patients' daily lives.

The indicator *Accepts diagnosis* was rated as unnecessary, and most often in the second round. Several comments also were related to this indicator because this indicator was not a behavior and not a part of self-management. Based on the decisions and comments of the respondents about content validity, revisions of some indicators mentioned above are required to improve the importance of the indicators and the credibility of the outcomes in the empirical world.

Current NOC validation studies usually identify important NOC outcomes for specific nursing diagnoses (de Fátima Lucena et al., 2013; Lopes et al., 2009; Seganfredo

& Almeida Mde, 2011). These studies adapt Fehrings' model to validate the importance of NOC outcomes, and report their importance such as OCV scores like this study. However, the results from these studies focused on more nursing diagnoses. In other words, their research questions were how a NOC outcome is important for a nursing diagnosis, not specific populations. The validated NOC outcomes in this study emphasized two chronic diseases rather than specific nursing diagnoses. Additionally, the results of content validity provide a direction for a revision of indicators. After revising indicators, the NOC outcomes will be widely used for the populations.

Specific Aim 3: Clinical Usefulness

Clinical usefulness was validated to evaluate whether the measurement scales were relevant for users to use knowledge or self-management outcomes in clinical settings. All the measurement scales were evaluated as quite relevant: the range of means was from 3.77 to 4.29 (see Table 39). Most respondents considered that the measurement scales were quite relevant; while the respondents in P4 considered that most scales were moderately relevant in Survey Set 2. Also, the respondents in P4 offered the most frequent comments on clinical usefulness of all the panels. Similarly to the case of the definition adequacy, the panel which marked the lower mean had more comments.

Regardless of the number of comments, the commenters frequently doubted the usefulness of the measurement scales using a 5-point format in clinical settings. They commented that it was really difficult for nurses to distinguish *substantial* from *extensive* knowledge. The commenters recommended using a 2 or 3- point scales instead of the 5-point scales, for example, the 2- point scales could be yes (known)/ no (unknown) choices, and the 3-point scales could be (I know) sufficiently/ some/ no choices for the

knowledge outcomes. Likewise, the commenters argued how to distinguish *often* and *consistently* demonstrated in the measurement scales of the self-management outcomes. In the case of self-management outcomes, they recommended using patient-focused scales such as doing/ not doing choices in order to use the outcomes directly by patients.

A previous study reported clinical usefulness of some NOC outcomes after field tests (Maas et al., 2002). This study collected comments from nurses about any difficulties using the outcomes and measures. The overall result of clinical usefulness was that the nurses find the outcomes and measures easy to use. However, some comments reported doubts about the indicator ratings, outcome scores, and the way of scoring. For consistency, all the NOC outcomes are evaluated using a 5-point scale with a not applicable (N/A) option. This measurement scale is appropriate for some NOC outcomes such as severity outcomes; however, using the 5-point scale would not be suitable for other NOC outcomes based on the comments about the measurement scales. Applying different types of a scale based on outcome domains would be recommended to improve the clinical usefulness of NOC outcomes for accurate assessments and evaluations in various clinical settings.

Specific Aim 4: Content Similarity

Content similarity was validated to evaluate whether knowledge and behavior indicators in a pair of the outcomes were connected to each other to measure the same disease or condition. There were the six pairs of outcomes, and all the pairs were evaluated that outcome indicators in the pair were mostly similar to each other. However, all the means by the respondents in C2 (P2, 4, and 6) were slightly lower than the means by the respondents in C1 (P1, 3, and 5) (see Table 40). One of the possible reasons for the

difference between both expert categories was that all the self-management outcomes contained more indicators than the knowledge outcomes (see Table 38), for example, *Self-Management: Chronic Disease* had 21 more indicators than *Knowledge: Chronic Disease Management*. Similarly, the self-management outcomes in both Pair 2 and 3 had 10 more indicators than the knowledge outcomes. The difference between the numbers of indicators in the pair would have made the respondents in C2 confused to evaluate content similarity.

The other possible reason was the order of the indicators. Because the self-management outcomes contained more indicators, the order of indicators in both self-management and knowledge outcomes was not directly matched. In case of Pair 3, indicators related to medication were ordered from 19th to 22nd in the self-management outcome, whereas the indicators about medication were placed from 12th to 15th in the knowledge outcome. This difference of indicator orders could have been a reason why the respondents in C2 did not consider that the content in pairs was matched. In order to increase content similarity, it is necessary for the pair outcomes to contain similar numbers and the order of indicators.

Implication of the Study Results

Implication for Nursing Practice

With the expansion and adoption of electronic health records (EHR), nursing computerized information systems (CIS) have developed. Development and use of standardized nursing languages (SNL) about nursing diagnoses, nursing-sensitive patient

outcomes, and nursing interventions also have been required to utilize CIS. Recently, many hospitals utilize CIS with developed SNL, and nurses use the SNL for planning of care. By using SNL such as NOC outcomes for patient outcomes, nurses can have standardized patient data and outcomes through patient assessments and evaluations. Especially, standardized patient outcomes can be obtained at baseline, intermediate, and terminal points within the care plans to make comparisons of the efficacy and effects of nursing interventions. Nurses can communicate and share these standardized results among nurses and with other health care providers without misunderstanding. This study validated the 12 NOC outcomes, and the results of this study provided evidence on these 12 NOC outcomes that the outcomes were credible to evaluate patient outcomes in clinical settings. Thus, nurses can obtain credible and accurate patient data and outcomes, determine the effects of applied nursing interventions, and communicate clearly among nurses and with health care providers in other disciplines about standardized nursing results. Clear communication among nurses and with other health care providers will contribute to the improvement of the quality of care, teamwork, and productivity.

Additionally, the 12 NOC outcomes validated in this study were related to self-management for patients with CVDs and diabetes. The validated NOC outcomes have linguistic clarity, and redundant indicators can be removed to save time. Patients with CVDs or diabetes can directly use the validated NOC outcomes to evaluate and self-manage their health conditions in daily lives. Also, patients can set or change their plans of care with their health providers based on the results of evaluations. Likewise, health care providers in other disciplines who work with patients with CVDs or diabetes can

also apply the validated NOC outcomes to their patient to evaluate patient outcomes and to test the efficacy and effects of their interventions in various settings.

Implication for Nursing Education

Nursing work environments have rapidly changed because of the health policies, new health technology, various patient needs, and diverse treatment procedures. To adapt to these changes, nurses should think critically, solve problems effectively, and make clinical decisions correctly. Nursing students should learn these ways of thinking in undergraduate nursing programs to be a professional nurse. The use of SNL in the nursing process helps nursing students learn how to think critically. Also, the importance of using SNL is emphasized to communicate effectively, collect and analyze nursing data efficiently, and evaluate the quality of care by expanding CIS in clinical settings. Thus, nursing faculty and students must be knowledgeable about SNL and how the languages can be used in the nursing process. Many nursing schools already have a course which is teaching the use of SNL in the nursing process in their curriculum for students to develop decision making skills. When learning the use of SNL, the languages need to be linguistically accurate and comprehensive for students to understand and use SNL rightly. The validated NOC outcomes provide linguistic accuracy. Nursing students can understand the exact meaning of the outcomes, and can utilize the outcomes to specific populations.

Implication for Nursing Research

This study provides empirical evidence of the 12 NOC outcomes which were linguistically accurate and clinically useful, and the indicators of the outcomes were

credibly important. The methods and results of this study will be used by researchers who are interested in validation research for NOC outcomes. When conducting a validation study, researchers can modify the methods of this study: developing inclusion and exclusion criteria, sampling procedure, developing questionnaires, measuring variables, survey settings, surveying procedure, and analyzing data. In addition, researchers can improve upon the limitations of this study to obtain more valuable results from respondents.

The results of this study can also be used for researchers who want to test the efficacy and effects of nursing interventions. The validated NOC outcomes in this study were focused on self-management. Knowledge, skills, and confidence are usually required for effective self-management, and the validated NOC outcomes can be linked to interventions for teaching and self-efficacy enhancement. If the purpose of research is to test the effects of these interventions, the validated NOC outcomes could be used to evaluate the effects of study interventions.

Moreover, the results of this study will be used for researchers who focus their research on patients with CVDs or diabetes. Researchers can use the validated NOC outcomes to evaluate the level of knowledge and self-management behaviors of their patients at base, intermediate, and terminal points of their clinical studies. These validated NOC outcomes would provide researchers with more accurate measured data.

Study Limitations and Recommendations for Future Research

Some study limitations and recommendations for further research were raised. The first limitation was related to the method of this study. Because the purpose of this study was a validation, the Delphi technique was applied. Generally, experts in the Delphi technique and a validation study have recommended researchers invite up to 10 experts to make a consensus effectively. However, this sample size was not suitable for statistical analyses. Indeed, this study had a small sample size, and most variables did not meet the criteria for the normality; thus, a non-parametric analysis method was applied for group comparisons. There were really small differences between both expert categories. For example, a total of 437 indicators were evaluated by the respondents in both categories, only the importance of 18 indicators (4%) significantly differed from both categories. In other words, the group comparisons with the small sample size in this study were not meaningful to verify differences between the two professional perspectives about the selected NOC outcomes which was one of reasons to collect data from the two expert categories. To obtain more valuable opinions and to verify different professional perspectives from respondents, it would be recommended to invite nurse experts who have a doctor of nursing practice degree or a PhD rather than a master's degree in the specialty, or to analyze respondents' comments qualitatively instead of using a statistical method for quantitative data.

This study used a two round survey design to make more clear evaluation. The purpose of the second round was to confirm the results from the first round. In the second round, this study did not ask to leave comments about the reasons of decisions to save the time and to reduce a burden of respondents because they rated around 150 questions.

Therefore, this study did not collect and analyze data from the second round respondents why they disagree with the results from the first round, and why they thought the indicator was not necessary for the outcome. Further study about content validity should collect and analyze data about reasons for decisions by using one or two NOC outcomes to obtain expert opinions on indicators to improve credibility of the validated NOC outcomes.

The other limitation was related to the OCV method. This method was developed based on the Fehring model, and many validation studies for NOC outcomes have used this method. However, the criteria for interpretation of the OCV method were unclear. Indicator ratio and OCV score were categorized by the same criteria, and there were no detailed explanations for interpretation. Thus, more clear and detailed information for interpretation is required to analyze data.

This study validated the 12 NOC outcomes by the nurse experts in SNLs and self-management to refine and improve the NOC outcomes. The next step from this study is to use the validated NOC outcomes in clinical settings by users, and then to evaluate the effects of using the NOC outcomes. The other suggestion is to verify possibilities that patients with CVDs or diabetes can use these NOC outcomes to evaluate their conditions by themselves in daily lives.

Moreover, the validated NOC outcomes were in English. The results and recommendations of this study could not be generalized to the NOC outcomes in other languages and in other domains although NOC is translated into 11 different languages at this time. For credible evidence of the validated NOC outcomes internationally, further validation studies based on particular cultures are recommended.

Conclusion

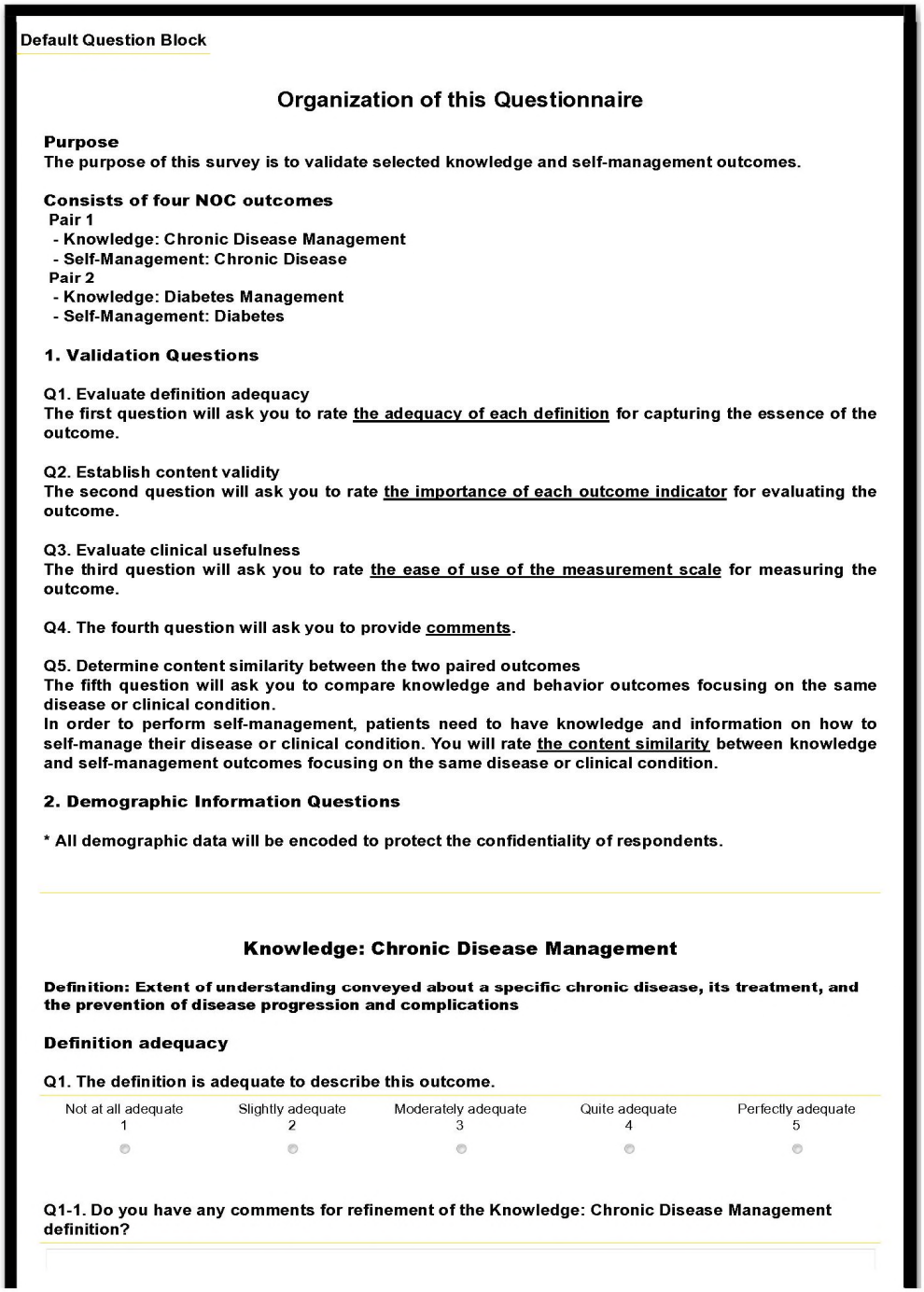
One of the major roles of nurses is to assess and evaluate patient health conditions and outcomes. Nurses should use a credible evaluation tool for patient assessment and evaluation to obtain accurate nursing data. Through the accurate nursing-sensitive patient data, nurses can recognize patients' status, and determine the effects of nursing interventions. The information about patients and nursing interventions will contribute to improvement of quality of care and development of nursing knowledge. In this study, the 12 nursing outcomes were validated to provide empirical evidence of the outcomes, and the results of this study were acceptable for the use of the outcomes in clinical settings. The validated 12 outcomes can be used by nurses, health care providers in other disciplines, and patients to evaluate patient outcomes. By using the outcomes, they can have accurately standardized patient outcomes. It would make them easy to share and communicate patient outcome information with one another. Sharing information and communication among nurses, other health care providers, and patients could lead to improving quality of care and patient satisfaction. The adoption and use of EHR has gradually expanded in health care settings, and a rate of adoption of CIS in EHR has also increased; thus, development and use of SNL for CIS has been required. To catch up with changes and challenges in health care, SNL will be continually developed in the future. To provide clinical evidence, further validation research is recommended.

Summary

This study was conducted to validate the 12 NOC outcomes focused on knowledge and self-management for patients with CVDs and diabetes. A total of 46 respondents participated in the first round, and 27 of the 46 respondents participated in the second round. There were six expert panels, and each panel validated four NOC outcomes. The number of experts in each panel in both rounds satisfied the recommendation for a content validity study. The level of expertise was evaluated using Fehring's method after modification. Most respondents reached his recommended level, and all were satisfied with the criteria for this study. There were four specific aims in this study: evaluations of definition adequacy, indicator importance, clinical usefulness, and content similarity. They obtained acceptable psychometric properties. A number of suggestions to improve the outcomes with definitions, indicators, measurement scales were made by respondents. These suggestions gave a direction to the outcomes how to be revised. The validated NOC outcomes will be used by nurses caring for patients with CVDs and diabetes to assess and evaluate patient status and health outcomes accurately. Standardized nursing outcomes through using these NOC outcomes can help nurses and other health care providers communicate and share information without misunderstanding. Nursing students and the public can understand the validated NOC outcomes clearly when they use these outcomes. These NOC outcomes can be used to test efficacy and effects of interventions for patients with CVDs and diabetes. As a result, development and validation of new outcomes will provide nurses with clinical evidence for quality improvement and knowledge development.

APPENDIX A: QUESTIONNAIRES

Questionnaire for the Survey Set 1 in the First Round



Default Question Block

Organization of this Questionnaire

Purpose
The purpose of this survey is to validate selected knowledge and self-management outcomes.

Consists of four NOC outcomes
Pair 1
- Knowledge: Chronic Disease Management
- Self-Management: Chronic Disease

Pair 2
- Knowledge: Diabetes Management
- Self-Management: Diabetes

1. Validation Questions

Q1. Evaluate definition adequacy
The first question will ask you to rate the adequacy of each definition for capturing the essence of the outcome.

Q2. Establish content validity
The second question will ask you to rate the importance of each outcome indicator for evaluating the outcome.

Q3. Evaluate clinical usefulness
The third question will ask you to rate the ease of use of the measurement scale for measuring the outcome.

Q4. The fourth question will ask you to provide comments.

Q5. Determine content similarity between the two paired outcomes
The fifth question will ask you to compare knowledge and behavior outcomes focusing on the same disease or clinical condition.
In order to perform self-management, patients need to have knowledge and information on how to self-manage their disease or clinical condition. You will rate the content similarity between knowledge and self-management outcomes focusing on the same disease or clinical condition.

2. Demographic Information Questions

* All demographic data will be encoded to protect the confidentiality of respondents.

Knowledge: Chronic Disease Management

Definition: Extent of understanding conveyed about a specific chronic disease, its treatment, and the prevention of disease progression and complications

Definition adequacy

Q1. The definition is adequate to describe this outcome.

Not at all adequate	Slightly adequate	Moderately adequate	Quite adequate	Perfectly adequate
1	2	3	4	5
○	○	○	○	○

Q1-1. Do you have any comments for refinement of the Knowledge: Chronic Disease Management definition?

Knowledge: Chronic Disease Management

Importance of outcome indicators

Q2. Please rate the importance of each indicator for this outcome (1/2).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Cause and contributing factors					
Usual course of disease					
Benefits of disease management					
Signs and symptoms of chronic disease					
Signs and symptoms of disease progression					
Signs and symptoms of complications					
Strategies to prevent complications					
Strategies to balance activity and rest					
Strategies to manage pain					
Available treatment options					
Correct use of prescribed medication					
Medication therapeutic effects					
Medication side effects					
Medication adverse effects					
Potential medication interactions					

Importance of outcome indicators

Q2. Please rate the importance of each indicator for this outcome (2/2).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Required laboratory tests					
Procedures involved in treatment regimen					
Personal responsibilities for treatment regimen					
Importance of compliance with treatment regimen					
Recommended immunizations					
Cultural influences on compliance to treatment regimen					
Prescribed diet					
Strategies for tobacco cessation					
Strategies to cope with adverse effects of disease					
Financial resources for assistance					
Available support groups					
Available community resources					
Reputable sources of chronic disease information related to disease					
When to obtain assistance from a health professional					
Actions to take in an emergency					

Knowledge: Chronic Disease Management

Ease of use of the measurement scale

This knowledge outcome uses a 5-point measurement scale: No knowledge (1) – Limited knowledge (2) – Moderate knowledge (3) – Substantial knowledge (4) – Extensive knowledge (5). This scale also includes 'Not applicable.'

Q3. Do you think this measurement scale is relevant to evaluate each indicator?

Never relevant 1	Slightly relevant 2	Moderately relevant 3	Quite relevant 4	Very relevant 5

Q3-1. Do you have any comments for the measurement scale of this outcome**?**

Q4. Do you have any comments for improving the outcome "Knowledge: Chronic Disease Management?"

Self-Management: Chronic Disease

Definition: Personal actions to manage a chronic disease, its treatment, and to prevent disease progression and complications

Definition adequacy

Q1. The definition is adequate to describe this outcome.

Not at all adequate 1	Slightly adequate 2	Moderately adequate 3	Quite adequate 4	Perfectly adequate 5
○	○	○	○	○

Q1-1. Do you have any comments for refinement of the Self-Management: Chronic Disease definition?

Self-Management: Chronic Disease

Importance of outcome indicators

Q2. Please rate the importance of each indicator for this outcome (1/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Accepts diagnosis	○	○	○	○	○
Seeks information about disease	○	○	○	○	○
Monitors signs and symptoms of disease	○	○	○	○	○
Follows recommended precautions	○	○	○	○	○
Seeks information about methods to prevent complications	○	○	○	○	○
Monitors for signs and symptoms of complications	○	○	○	○	○
Reports signs and symptoms of complications	○	○	○	○	○
Uses symptom relief strategies	○	○	○	○	○
Identifies cultural beliefs that impact treatment	○	○	○	○	○
Discusses cultural beliefs that impact treatment with health provider	○	○	○	○	○
Follows recommended treatment	○	○	○	○	○
Performs prescribed procedure	○	○	○	○	○
Uses treatment devices correctly	○	○	○	○	○
Monitors treatment therapeutic effects	○	○	○	○	○
Monitors treatment side effects	○	○	○	○	○
Alters roles to meet treatment requirements	○	○	○	○	○
Obtains required laboratory tests	○	○	○	○	○

Importance of outcome indicators

Q2. Please rate the importance of each indicator for this outcome (2/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Follows medication regimen					
Monitors medication therapeutic effects					
Monitors medication side effects					
Monitors medication adverse effects					
Uses only nonprescription medication approved by health professional					
Seeks assistance for self-care					
Follows recommended diet					
Follows recommended activity level					
Participates in recommended exercises					
Eliminates tobacco use					
Uses stress management strategies					
Maintains optimum weight					
Monitors vital signs					
Avoids behaviors that potential disease progression					
Uses strategies to prevent complications					
Adjusts life routine for optimal health					
Uses strategies to cope with effects of disease					

Importance of outcome indicators

Q2. Please rate the importance of each indicator for this outcome (3/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Uses strategies to enhance comfort	○	○	○	○	○
Uses strategies to control pain	○	○	○	○	○
Uses strategies to maintain adequate sleep	○	○	○	○	○
Balances activity and rest	○	○	○	○	○
Obtains influenza seasonal vaccine	○	○	○	○	○
Obtains pneumonia vaccine	○	○	○	○	○
Participates in prescribed educational program	○	○	○	○	○
Monitors changes in disease	○	○	○	○	○
Uses reputable sources of information	○	○	○	○	○
Participates in health care decisions	○	○	○	○	○
Uses case manager to coordinate care	○	○	○	○	○
Uses health care services congruent with needs	○	○	○	○	○
Develops plan for medical emergencies	○	○	○	○	○
Obtains advice from health professional as needed	○	○	○	○	○
Keeps appointments with health professional	○	○	○	○	○
Uses support group	○	○	○	○	○
Uses available community resources	○	○	○	○	○

Self-Management: Chronic Disease

Ease of use of the measurement scale

This self-management outcome uses a 5-point measurement scale: Never demonstrated (1) – Rarely demonstrated (2) – Sometimes demonstrated (3) – Often demonstrated (4) – Consistently demonstrated (5). This scale also includes 'Not applicable.'

Q3. Do you think this measurement scale is relevant to evaluate each indicator?

Never relevant 1	Slightly relevant 2	Moderately relevant 3	Quite relevant 4	Very relevant 5
○	○	○	○	○

Q3-1. Do you have any comments for the measurement scale of this outcome**?**

Q4. Do you have any comments for improving the outcome "Self-Management: Chronic Disease?"

Content similarity between indicators of Knowledge: Chronic Disease and Self-Management: Chronic Disease

Q5. Do you think the content of patient knowledge matches the content of patient behaviors about chronic disease self-management?

Not matched	Slightly matched	Partially matched	Mostly matched	Perfectly matched
1	2	3	4	5
○	○	○	○	○

Q5-1. Do you have any comments for content similarity between indicators of these paired outcomes for chronic disease management?

Knowledge: Diabetes Management

Definition: Extent of understanding conveyed about diabetes, its treatment, and the prevention of complications

Definition Adequacy

Q1. The definition is adequate to describe this outcome.

Not at all adequate	Slightly adequate	Moderately adequate	Quite adequate	Perfectly adequate
1	2	3	4	5
○	○	○	○	○

Q1-1. Do you have any comments for refinement of the Knowledge: Diabetes Management definition?

Knowledge: Diabetes Management

Importance of indicators

Q2. Please rate the importance of each indicator for this outcome (1/2).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Cause and contributing factors					
Signs and symptoms of early disease					
Role of diet in blood glucose control					
Prescribed meal plan					
Strategies to increase diet compliance					
Role of exercise in blood glucose control					
Role of sleep in blood glucose control					
Hyperglycemia and related symptoms					
Hyperglycemia prevention					
Procedures to be followed in treating hyperglycemia					
Hypoglycemia and related symptoms					
Hypoglycemia prevention					
Procedures to be followed in treating hypoglycemia					
Importance of maintaining blood glucose level within target range					
Impact of acute illness on blood glucose level					
How to use a monitoring device					
Actions to take in response to blood glucose levels					
Prescribed insulin regimen					

Importance of indicators

Q2. Please rate the importance of each indicator for this outcome (2/2).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Correct use of insulin					
Proper technique to draw up and administer insulin					
Plan for rotation of injection sites					
Onset, peak and duration of prescribed insulin					
Proper disposal of syringes and needles					
Prescribed oral medication regimen					
Correct use of prescribed medication					
Correct use of non-prescription medication					
Proper medication storage					
Medication therapeutic effects					
Medication side effects					
Medication adverse effects					
When to obtain assistance from a health professional					
Correct procedure for urine ketone testing					
Importance of dilated eye exam and vision testing by an ophthalmologist					
Preventive foot care practices					
Reputable sources of diabetes information					
Benefits of disease management					

Knowledge: Diabetes Management

Ease of use of the measurement scale

This knowledge outcome uses a 5-point measurement scale: No knowledge (1) – Limited knowledge (2) – Moderate knowledge (3) – Substantial knowledge (4) – Extensive knowledge (5). This scale also includes 'Not applicable.'

Q3. Do you think this measurement scale is relevant to evaluate each indicator?

Never relevant 1	Slightly relevant 2	Moderately relevant 3	Quite relevant 4	Very relevant 5

Q3-1. Do you have any comments for the measurement scale of this outcome**?**

Q4. Do you have any comments for improving the outcome "Knowledge: Diabetes Management?"

Self-Management: Diabetes

Definition: Personal actions to manage diabetes, its treatment, and to prevent complications

Definition adequacy

Q1. The definition is adequate to describe this outcome.

Not at all adequate 1	Slightly adequate 2	Moderately adequate 3	Quite adequate 4	Perfectly adequate 5
○	○	○	○	○

Q1-1. Do you have any comments for refinement of the Self-Management: Diabetes definition?

Self-Management: Diabetes

Importance of indicators

Q2. Please rate the importance of each indicator for this outcome (1/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Accepts diagnosis	○	○	○	○	○
Seeks information about methods to prevent complications	○	○	○	○	○
Performs preventive foot care practices	○	○	○	○	○
Obtains dilated vision examination as recommended	○	○	○	○	○
Adjusts medication when acutely ill	○	○	○	○	○
Reports non-healing breaks in skin to primary care provider	○	○	○	○	○
Participates in health care decisions	○	○	○	○	○
Participates in prescribed educational program	○	○	○	○	○
Performs treatment regimen as prescribed	○	○	○	○	○
Performs correct procedure for blood glucose testing	○	○	○	○	○
Monitors blood glucose	○	○	○	○	○
Treats symptoms of hyperglycemia	○	○	○	○	○
Treats symptoms of hypoglycemia	○	○	○	○	○
Monitors frequency of hypoglycemia episodes	○	○	○	○	○
Reports symptoms of complications	○	○	○	○	○

Importance of indicators

Q2. Please rate the importance of each indicator for this outcome (2/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Uses diary to monitor blood glucose level over time					
Uses preventive measures to reduce risk for complications					
Obtains health care if blood glucose levels fluctuate outside of recommendations					
Monitors urinary glucose and ketones					
Follows recommended diet					
Follows recommended activity level					
Monitors body weight					
Uses effective weight control strategies					
Maintains optimum weight					
Follows recommendations for alcohol use					
Participates in smoking cessation regimen					
Participates in recommended exercise					
Performs usual life routine					
Uses correct procedure for insulin administration					
Stores insulin correctly					

Importance of indicators

Q2. Please rate the importance of each indicator for this outcome (3/3).

	Not at all important 1	Slightly important 2	Moderately important 3	Quite important 4	Very important 5
Obtains required medication					
Uses medication as prescribed					
Monitors medication therapeutic effects					
Rotates injection sites					
Uses only nonprescription medication approved by health professional					
Obtains influenza seasonal vaccine					
Obtains pneumonia vaccine					
Uses health care services congruent with needs					
Reports need for financial assistance					
Keeps appointments with health professional					
Maintains plan for medical emergencies					
Obtains preconception counseling					
Monitors for signs and symptoms of depression					
Adjusts life routine for optimal health					

Self-Management: Diabetes

Ease of use of the measurement scale

This self-management outcome uses a 5-point measurement scale: Never demonstrated (1) – Rarely demonstrated (2) – Sometimes demonstrated (3) – Often demonstrated (4) – Consistently demonstrated (5). This scale also includes 'Not applicable.'

Q3. Do you think this measurement scale is relevant to evaluate each indicator?

Never relevant 1	Slightly relevant 2	Moderately relevant 3	Quite relevant 4	Very relevant 5

Q3-1. Do you have any comments for the measurement scale of this outcome?

Q4. Do you have any comments for improving the outcome "Self-Management: Diabetes?"

Content similarity between indicators of Knowledge: Diabetes and Self-Management: Diabetes

Q5. Do you think the content of patient knowledge matches the content of patient behaviors about diabetes self-management?

Not matched	Slightly matched	Partially matched	Mostly matched	Perfectly matched
1	2	3	4	5
○	○	○	○	○

Q5-1. Do you have any comments for content similarity between indicators of these paired outcomes for diabetes disease management?

Demographic Information

Age (years)

Gender

Male	Female
○	○

Are you currently employed in nursing?

Yes	No
○	○

How many years have you worked as a licensed professional nurse?

Are you currently participating in any of following organizations?

- ○ Organizations focused on standardized nursing languages (SNL) (e.g. NANDA-I)
- ○ Organizations focused on nursing research (e.g. MNRS)
- ○ Both
- ○ Other

Which organization are you participating in?

What is your highest level of education?

- Bachelor of Science in Nursing
- Master-Nursing
- Master-Other
- PhD-Nursing
- PhD-Other
- DNP
- Other

What is your current level of education?

Which of the following best describes the setting in which you work?

- Ambulatory Setting
- College or University
- Community Health
- Elementary or secondary school
- Home Health
- Hospital
- Long Term Care
- Occupational Health
- Professional Organization
- Public Health
- Research Organization
- Other

Which of the following best describes your specialty? (Check all that apply)

- ☐ Ambulatory Care
- ☐ Education
- ☐ Geriatrics
- ☐ Home Health
- ☐ Management/Administration
- ☐ Medical-Surgical
- ☐ Nursing Informatics
- ☐ Occupational Health
- ☐ Oncology
- ☐ Pediatrics
- ☐ Psychiatric and Mental Health
- ☐ Public Health
- ☐ Specialty Medicine (e.g. Cardiology, Organ Transplant, Neurology)
- ☐ Specialty Surgery (e.g. ENT, Urology, Orthopedics)
- ☐ Women's Health
- ☐ Other

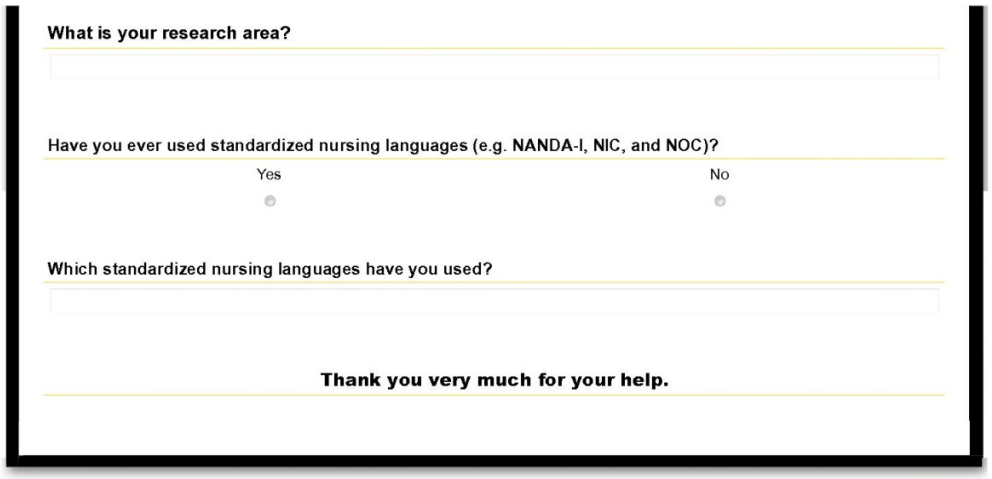
How long have you worked in your specialty? (years)

Which of the following experiences do you have? (Check all that apply)

- ☐ Master's degree in Nursing
- ☐ Master's degree in Nursing with a thesis related to SNLs/ self-management for chronic disease
- ☐ Conducted research on the given SNLs/ self-management for chronic disease
- ☐ Published article on the SNLs/ self-management in a refereed journal
- ☐ Doctoral dissertation on SNLs/ self-management for chronic disease
- ☐ Clinical practice of at least 1 year duration in an area related to cardiovascular disease or diabetes
- ☐ Certification in area of clinical practice relevant to cardiovascular disease or diabetes

Which of the following positions do you currently hold? (Check all that apply)

- ☐ Case Manager
- ☐ Chief Nurse Officer
- ☐ Clinical Specialist
- ☐ Educator (including Professor)
- ☐ Nurse Practitioner
- ☐ Quality Assurance Coordinator
- ☐ Researcher
- ☐ Staff Nurse
- ☐ Supervisor or Head Nurse
- ☐ Other



What is your research area?

Have you ever used standardized nursing languages (e.g. NANDA-I, NIC, and NOC)?

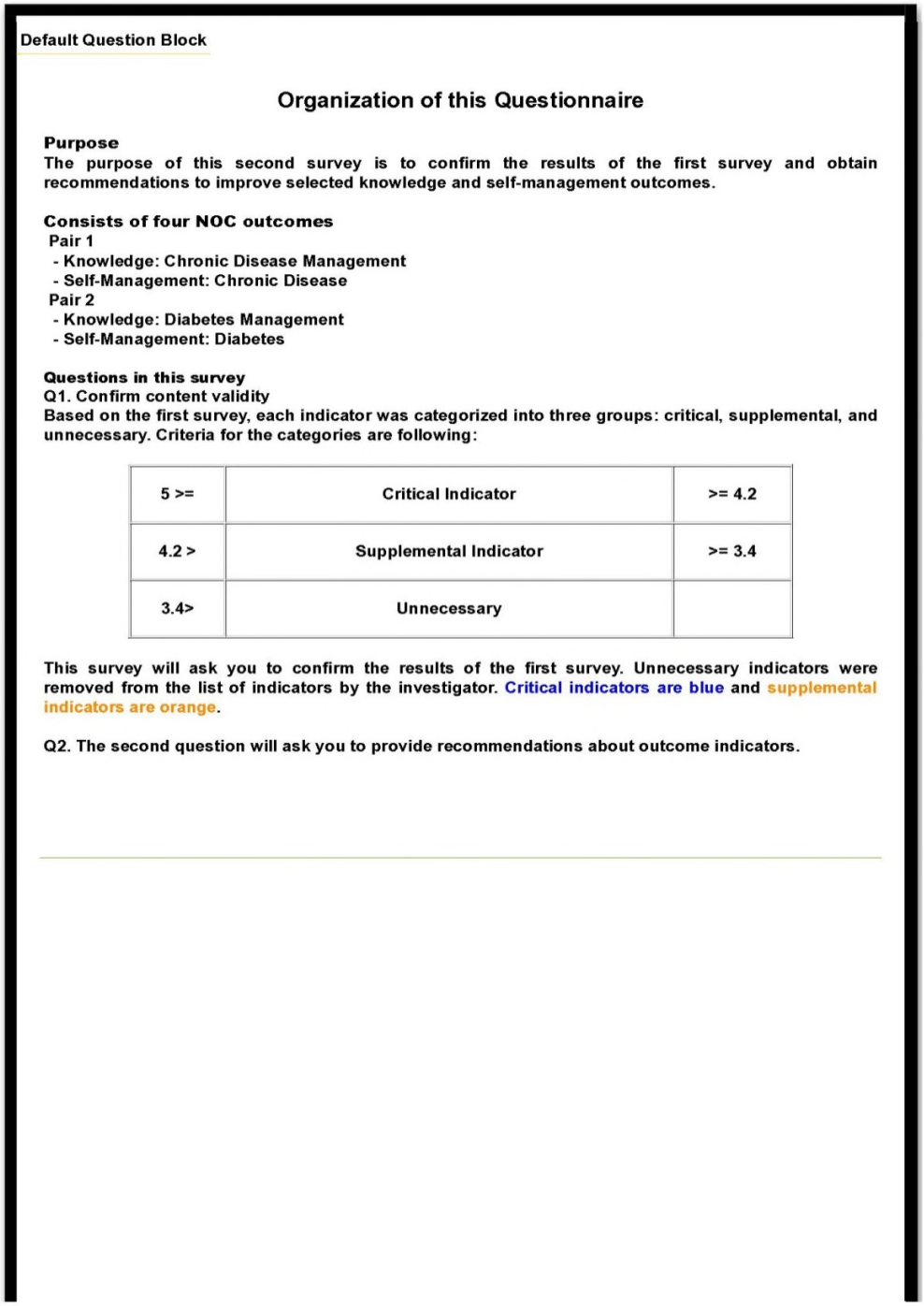
Yes

No

Which standardized nursing languages have you used?

Thank you very much for your help.

Questionnaire for the Survey Set 1 in the Second Round



Default Question Block

Organization of this Questionnaire

Purpose
The purpose of this second survey is to confirm the results of the first survey and obtain recommendations to improve selected knowledge and self-management outcomes.

Consists of four NOC outcomes
Pair 1
- Knowledge: Chronic Disease Management
- Self-Management: Chronic Disease

Pair 2
- Knowledge: Diabetes Management
- Self-Management: Diabetes

Questions in this survey
Q1. Confirm content validity
Based on the first survey, each indicator was categorized into three groups: critical, supplemental, and unnecessary. Criteria for the categories are following:

5 >=	Critical Indicator	>= 4.2
4.2 >	Supplemental Indicator	>= 3.4
3.4>	Unnecessary	

This survey will ask you to confirm the results of the first survey. Unnecessary indicators were removed from the list of indicators by the investigator. Critical indicators are blue and supplemental indicators are orange.

Q2. The second question will ask you to provide recommendations about outcome indicators.

Knowledge: Chronic Disease Management

Importance of outcome indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

Example>
If you think the indicator 'Cause and contributing factors' is critical, select "agree with priority rating";
if you think this indicator is not critical, select "disagree with priority rating";
or if you think this indicator is unnecessary for this NOC outcome, please select "discard."

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Cause and contributing factors	○	○	○
Usual course of disease	○	○	○
Benefits of disease management	○	○	○
Signs and symptoms of chronic disease	○	○	○
Signs and symptoms of disease progression	○	○	○
Signs and symptoms of complications	○	○	○
Strategies to prevent complications	○	○	○
Strategies to balance activity and rest	○	○	○
Strategies to manage pain	○	○	○
Available treatment options	○	○	○
Correct use of prescribed medication	○	○	○
Medication therapeutic effects	○	○	○
Medication side effects	○	○	○
Medication adverse effects	○	○	○
Potential medication interactions	○	○	○

Importance of outcome indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Required laboratory tests	○	○	○
Procedures involved in treatment regimen	○	○	○
Personal responsibilities for treatment regimen	○	○	○
Importance of compliance with treatment regimen	○	○	○
Recommended immunizations	○	○	○
Cultural influences on compliance to treatment regimen	○	○	○
Prescribed diet	○	○	○
Strategies for tobacco cessation	○	○	○
Strategies to cope with adverse effects of disease	○	○	○
Financial resources for assistance	○	○	○
Available support groups	○	○	○
Available community resources	○	○	○
Reputable sources of chronic disease information related to disease	○	○	○
When to obtain assistance from a health professional	○	○	○
Actions to take in an emergency	○	○	○

Self-Management: Chronic Disease

Importance of outcome indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

Example>
If you think the indicator 'Accepts diagnosis' is supplemental, select "agree with priority rating ";
if you think this indicator is not supplemental, select "disagree with priority rating";
or if you think this indicator is unnecessary for this NOC outcome, please select "discard."

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Accepts diagnosis	○	○	○
Seeks information about disease	○	○	○
Monitors signs and symptoms of disease	○	○	○
Follows recommended precautions	○	○	○
Seeks information about methods to prevent complications	○	○	○
Monitors for signs and symptoms of complications	○	○	○
Reports signs and symptoms of complications	○	○	○
Uses symptom relief strategies	○	○	○
Identifies cultural beliefs that impact treatment	○	○	○
Discusses cultural beliefs that impact treatment with health provider	○	○	○
Follows recommended treatment	○	○	○
Performs prescribed procedure	○	○	○
Uses treatment devices correctly	○	○	○
Monitors treatment therapeutic effects	○	○	○
Monitors treatment side effects	○	○	○
Alters roles to meet treatment requirements	○	○	○
Obtains required laboratory tests	○	○	○

Importance of outcome indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Follows medication regimen	○	○	○
Monitors medication therapeutic effects	○	○	○
Monitors medication side effects	○	○	○
Monitors medication adverse effects	○	○	○
Uses only nonprescription medication approved by health professional	○	○	○
Seeks assistance for self-care	○	○	○
Follows recommended diet	○	○	○
Follows recommended activity level	○	○	○
Participates in recommended exercises	○	○	○
Eliminates tobacco use	○	○	○
Uses stress management strategies	○	○	○
Maintains optimum weight	○	○	○
Monitors vital signs	○	○	○
Avoids behaviors that potentiate disease progression	○	○	○
Uses strategies to prevent complications	○	○	○
Adjusts life routine for optimal health	○	○	○
Uses strategies to cope with effects of disease	○	○	○

Importance of outcome indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Uses strategies to enhance comfort	○	○	○
Uses strategies to control pain	○	○	○
Uses strategies to maintain adequate sleep	○	○	○
Balances activity and rest	○	○	○
Obtains influenza seasonal vaccine	○	○	○
Obtains pneumonia vaccine	○	○	○
Participates in prescribed educational program	○	○	○
Monitors changes in disease	○	○	○
Uses reputable sources of information	○	○	○
Participates in health care decisions	○	○	○
Uses case manager to coordinate care	○	○	○
Uses health care services congruent with needs	○	○	○
Develops plan for medical emergencies	○	○	○
Obtains advice from health professional as needed	○	○	○
Keeps appointments with health professional	○	○	○
Uses available community resources	○	○	○

Knowledge: Diabetes Management

Importance of indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

Example>
If you think the indicator 'Cause and contributing factors' is critical, select "agree with priority rating ";
if you think this indicator is not critical, select "disagree with priority rating";
or if you think this indicator is unnecessary for this NOC outcome, please select "discard."

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Cause and contributing factors	○	○	○
Signs and symptoms of early disease	○	○	○
Role of diet in blood glucose control	○	○	○
Prescribed meal plan	○	○	○
Strategies to increase diet compliance	○	○	○
Role of exercise in blood glucose control	○	○	○
Role of sleep in blood glucose control	○	○	○
Hyperglycemia and related symptoms	○	○	○
Hyperglycemia prevention	○	○	○
Procedures to be followed in treating hyperglycemia	○	○	○
Hypoglycemia and related symptoms	○	○	○
Hypoglycemia prevention	○	○	○
Procedures to be followed in treating hypoglycemia	○	○	○
Importance of maintaining blood glucose level within target range	○	○	○
Impact of acute illness on blood glucose level	○	○	○
How to use a monitoring device	○	○	○
Actions to take in response to blood glucose levels	○	○	○
Prescribed insulin regimen	○	○	○

Importance of indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Correct use of insulin	○	○	○
Proper technique to draw up and administer insulin	○	○	○
Plan for rotation of injection sites	○	○	○
Onset, peak and duration of prescribed insulin	○	○	○
Proper disposal of syringes and needles	○	○	○
Prescribed oral medication regimen	○	○	○
Correct use of prescribed medication	○	○	○
Correct use of non-prescription medication	○	○	○
Proper medication storage	○	○	○
Medication therapeutic effects	○	○	○
Medication side effects	○	○	○
Medication adverse effects	○	○	○
When to obtain assistance from a health professional	○	○	○
Correct procedure for urine ketone testing	○	○	○
Importance of dilated eye exam and vision testing by an ophthalmologist	○	○	○
Preventive foot care practices	○	○	○
Reputable sources of diabetes information	○	○	○
Benefits of disease management	○	○	○

Self-Management: Diabetes

Importance of indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

Example>
If you think the indicator 'Accepts diagnosis' is critical, select "agree with priority rating ";
if you think this indicator is not critical, select "disagree with priority rating";
or if you think this indicator is unnecessary for this NOC outcome, please select "discard."

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Accepts diagnosis	○	○	○
Seeks information about methods to prevent complications	○	○	○
Performs preventive foot care practices	○	○	○
Obtains dilated vision examination as recommended	○	○	○
Adjusts medication when acutely ill	○	○	○
Reports non-healing breaks in skin to primary care provider	○	○	○
Participates in health care decisions	○	○	○
Participates in prescribed educational program	○	○	○
Performs treatment regimen as prescribed	○	○	○
Performs correct procedure for blood glucose testing	○	○	○
Monitors blood glucose	○	○	○
Treats symptoms of hyperglycemia	○	○	○
Treats symptoms of hypoglycemia	○	○	○
Monitors frequency of hypoglycemia episodes	○	○	○
Reports symptoms of complications	○	○	○

Importance of indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Uses diary to monitor blood glucose level over time			
Uses preventive measures to reduce risk for complications			
Obtains health care if blood glucose levels fluctuate outside of recommendations			
Monitors urinary glucose and ketones			
Follows recommended diet			
Follows recommended activity level			
Monitors body weight			
Uses effective weight control strategies			
Maintains optimum weight			
Follows recommendations for alcohol use			
Participates in smoking cessation regimen			
Participates in recommended exercise			
Performs usual life routine			
Uses correct procedure for insulin administration			
Stores insulin correctly			

Importance of indicators

Q1. Please select whether you agree or disagree with the priority rating for each indicator obtained from the results of the first survey. Blue color identifies a critical indicator. Orange color identifies a supplemental indicator. If you do not consider an indicator as critical or supplemental, you can select the 'discard' option.

	Agree with priority rating 1	Disagree with priority rating 2	Discard indicator 3
Obtains required medication	○	○	○
Uses medication as prescribed	○	○	○
Monitors medication therapeutic effects	○	○	○
Rotates injection sites	○	○	○
Uses only nonprescription medication approved by health professional	○	○	○
Obtains influenza seasonal vaccine	○	○	○
Obtains pneumonia vaccine	○	○	○
Uses health care services congruent with needs	○	○	○
Reports need for financial assistance	○	○	○
Keeps appointments with health professional	○	○	○
Maintains plan for medical emergencies	○	○	○
Obtains preconception counseling	○	○	○
Monitors for signs and symptoms of depression	○	○	○
Adjusts life routine for optimal health	○	○	○

Q2. Please provide any comments or suggestions you would like to share with the researcher.

Thank you very much.
The following page is for compensation.
Please complete the next page.

Information for compensation

Mailing address (street, city, state, zip code in U.S.)

Residency

Citizen	Permanent Resident	Non-resident
○	○	○

Visa status

Tax residency country

Permanent foreign address

Signature (Print your name to certify your information is accurate)

Thank you for your participation.
Have a good day!

APPENDIX B: EMAILS TO RESPONDENTS

Invitation Email to Fellows of CNC

FOR IRB USE ONLY
$STAMP_IRB
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Dear

I am writing to invite you to participate in a study to validate selected Nursing Outcomes Classification (NOC) outcomes focused on knowledge and self-management for patients with cardiovascular disease or diabetes.

Because of your expertise in the use of standardized nursing languages, you are invited in this study. We obtained your name and email address from a membership list of the Center for Nursing Classification and Clinical Effectiveness (CNC).

The purpose of this study is to validate 12 NOC outcomes. Each NOC outcome has a label, a definition, and a number of specific indicators. All NOC outcomes are at the individual level, and indicators are the observable patient status, condition or perception that can be measured to determine to what degree the outcome has been achieved. The questionnaire asks you to provide your expert judgment about four NOC outcomes. At the outcome level, you are asked to rate 1) the adequacy of an outcome definition, 2) the importance of outcome indicators, and 3) the ease of use of the measurement scale. You are also asked to rate the degree of content similarity between knowledge and self-management outcomes describing the same disease or clinical condition.

This study uses a two round survey design for a strong consensus among participants. After completing your first survey, you will receive the results of the first survey and the second survey within one month.

To participate in this study, please click the URL link for the survey at the bottom of this email. After accessing the link, you can read the directions of the survey. It will take around 30 minutes to complete the survey. Your responses will be saved automatically in the secured server. However, an incomplete survey will be saved only for seven days, so please complete the survey within this time frame. The investigator will send a reminder email if you do not complete the survey.

We will keep the information you provide confidential, however federal regulatory agencies and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. In order to send the second survey, we will keep your contact information however, any identifiers such as your name or email address will be encoded, and your identifiers and the survey link will be destroyed after the study is over (August, 2016). All data via your email survey will be saved in the secured server. Only the principal investigator will access the server with a password. If we write a report about this study we will do so in such a way that you cannot be identified. As an online survey, this study will ask you to provide information over the Internet. It is possible that your responses could be viewed by persons who have access to the computers hosting the web site or by unauthorized persons who gain access to the web site computers. We will use a secure web site.

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There are no known risks from participating in this study, and you will not benefit personally. However we hope that others may benefit in the future from what we learn as a result of this study. You will not have any costs for being in this study. You will be paid $20 (check) for full participation in the both surveys via mail so your mailing address will be required after completing the 2nd survey. If you do not turn in a form for compensation, it will be not paid.

Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Thank you very much for your consideration.

Sincerely,
Hyunkyoung Oh, MSN, RN
Sue Moorhead, PhD, RN, FAAN

If you want to take part in these surveys, please click the link below. Your completion of the survey will be considered your consent to participate.

LINK TO SURVEY GOES HERE

[The URL address]

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

Invitation Email to Members of MNRS

FOR IRB USE ONLY
$STAMP_IRB
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Dear

I am writing to invite you to participate in a study to validate selected Nursing Outcomes Classification (NOC) outcomes focused on knowledge and self-management for patients with cardiovascular disease or diabetes.

Because of your expertise in self-management for chronic disease, you are invited in this study. We obtained your name and email address from a directory of Research Interest Group (RIGs) of Midwest Nursing Research Society (MNRS).

The purpose of this study is to validate 12 NOC outcomes. Each NOC outcome has a label, a definition, and a number of specific indicators. All NOC outcomes are at the individual level, and indicators are the observable patient status, condition or perception that can be measured to determine to what degree the outcome has been achieved. The questionnaire asks you to provide your expert judgment about four NOC outcomes. At the outcome level, you are asked to rate 1) the adequacy of an outcome definition, 2) the importance of outcome indicators, and 3) the ease of use of the measurement scale. You are also asked to rate the degree of content similarity between knowledge and self-management outcomes describing the same disease or clinical condition.

This study uses a two round survey design for a strong consensus among participants. After completing your first survey, you will receive the results of the first survey and the second survey within one month.

To participate in this study, please click the URL link for the survey at the bottom of this email. After accessing the link, you can read the directions of the survey. It will take around 30 minutes to complete the survey. Your responses will be saved automatically in the secured server. However, an incomplete survey will be saved only for seven days, so please complete the survey within this time frame. The investigator will send a reminder email if you do not complete the survey.

We will keep the information you provide confidential, however federal regulatory agencies and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. In order to send the second survey, we will keep your contact information however, any identifiers such as your name or email address will be encoded, and your identifiers and the survey link will be destroyed after the study is over (August, 2016). All data via your email survey will be saved in the secured server. Only the principal investigator will access the server with a password. If we write a report about this study we will do so in such a way that you cannot be identified. As an online survey, this study will ask you to provide information over the Internet. It is possible that your responses could be viewed by persons who have access to the computers hosting the web site or by unauthorized persons who gain access to the web site computers. We will use a secure web site.

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There are no known risks from participating in this study, and you will not benefit personally. However we hope that others may benefit in the future from what we learn as a result of this study. You will not have any costs for being in this study. You will be paid $20 (check) for full participation in the both surveys via mail so your mailing address will be required after completing the 2nd survey. If you do not turn in a form for compensation, it will be not paid.

Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Thank you very much for your consideration.

Sincerely,
Hyunkyoung Oh, MSN, RN
Sue Moorhead, PhD, RN, FAAN

If you want to take part in these surveys, please click the link below. Your completion of the survey will be considered your consent to participate.

LINK TO SURVEY GOES HERE

[The URL address]

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

Introduction Email to Members of NANDA-I

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Title: Research Invitation: Nursing Outcomes Classification validation study

Nurse experts are invited to participate in a study that will validate the Nursing Outcomes Classification focused on Knowledge and Self-Management for people with cardiovascular diseases or diabetes.

Each participant will receive a survey to validate four NOC outcomes via email twice. Estimated time to complete the survey is about 30 minutes.
Researchers at the University of Iowa, College of Nursing are looking for nurse experts, who:

1) have a membership of NANDA-I, and
2) have at least a master's degree in Nursing.

Compensation will be paid to individuals who complete both surveys.

If you are interested in participating or would like more information, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Invitation Email to Members of NANDA-I

FOR IRB USE ONLY
$STAMP_IRB
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$STAMP_EXP_DT

Dear

Thank you for your participation.

The purpose of this study is to validate 12 Nursing Outcomes Classification (NOC) outcomes focused on knowledge and self-management for patients with cardiovascular disease or diabetes. Each NOC outcome has a label, a definition, and a number of specific indicators. All NOC outcomes are at the individual level, and indicators are the observable patient status, condition or perception that can be measured to determine to what degree the outcome has been achieved. The questionnaire asks you to provide your expert judgment about four NOC outcomes. At the outcome level, you are asked to rate 1) the adequacy of an outcome definition, 2) the importance of outcome indicators, and 3) the ease of use of the measurement scale. You are also asked to rate the degree of content similarity between knowledge and self-management outcomes describing the same disease or clinical condition.

This study uses a two round survey design for a strong consensus among participants. After completing your first survey, you will receive the results of the first survey and the second survey within one month.

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We will keep the information you provide confidential, however federal regulatory agencies and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. In order to send the second survey, we will keep your contact information however, any identifiers such as your name or email address will be encoded, and your identifiers and the survey link will be destroyed after the study is over (August, 2016). All data via your email survey will be saved in the secured server. Only the principal investigator will access the server with a password. If we write a report about this study we will do so in such a way that you cannot be identified. As an online survey, this study will ask you to provide information over the Internet. It is possible that your responses could be viewed by persons who have access to the computers hosting the web site or by unauthorized persons who gain access to the web site computers. We will use a secure web site.

There are no known risks from participating in this study, and you will not benefit personally. However we hope that others may benefit in the future from what we learn as a result of this study. You will not have any costs for being in this study. You will be paid

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$20 (check) for full participation in the both surveys via mail so your mailing address will be required after completing the 2nd survey. If you do not turn in a form for compensation, it will be not paid.

Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Thank you very much for your consideration.

Sincerely,
Hyunkyoung Oh, MSN, RN
Sue Moorhead, PhD, RN, FAAN

If you want to take part in these surveys, please click the link below. Your completion of the survey will be considered your consent to participate.

LINK TO SURVEY GOES HERE

[The URL address]

If you have questions about the rights of research subjects, please contact the Human Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

Reminder Email for Incomplete Survey

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Dear

Several days ago, we invited you to participate in a study about the validation of the Nursing Outcomes Classification (NOC) focused on knowledge and self-management of cardiovascular diseases or diabetes. You've already accessed the survey, however, your responses are not completed. Please consider taking time to complete the survey using the link in the invitation email. All your prior responses are automatically saved so that you can respond to the remaining questions. Thank you for participating.

If you have any questions, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Thank you for your consideration.
Sincerely,

Hyunkyoung Oh, MSN, RN
Sue Moorhead, PhD, RN, FAAN

Reminder Email for No Response

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Dear

In the past two weeks you received a survey to validate Nursing Outcomes Classification (NOC) related to knowledge and self-management of cardiovascular diseases or diabetes. If you have not yet responded, please consider taking time to complete your survey now.

To participate in this study, please click the URL link for the survey at the bottom of this email. After accessing the link, you can read the directions of the survey. It will take around 30 minutes to complete the survey. Your responses will be saved automatically in the secured server. However, an incomplete survey will be saved only for seven days, so please complete the survey within this time frame. The investigator will send a reminder email if you do not complete the survey.

This study uses a two round survey design for a strong consensus among participants. After completing your first survey, you will receive the results of the first survey and the second survey within one month. You will be paid $20 (check) for full participation in the both surveys via mail so your mailing address will be required after completing the 2nd survey.

Thank you for your participation in this research effort. As with all nursing studies, a good response makes the results more credible and assists in the development of knowledge that will ultimately improve nursing practice.

Thank you for your consideration.
Sincerely,

Hyunkyoung Oh, MSN, RN
Sue Moorhead, PhD, RN, FAAN

LINK TO SURVEY GOES HERE

[The URL address]

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Notification for the Second Round Survey

Dear 1st round survey respondents,

Thank you for your participation in the NOC validation study.

The 1st round survey was done. The data will be analyzed and 2nd round surveys will be revised based on the results of the 1st round survey. You will receive the 2nd round survey within one month.

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or email at sue-moorhead@uiowa.edu.

Thank you very much for your consideration.

Sincerely,

Hyunkyoung Oh, MSN, RN

Sue Moorhead, PhD, RN, FAAN

Follow-up Email for the Second Round Survey

FOR IRB USE ONLY
$STAMP_IRB
$STAMP_IRB_ID
$STAMP_APPRV_DT
$STAMP_EXP_DT

Dear

Thank you for your participation in the first survey.

The initial survey asked you to evaluate 1) the adequacy of an outcome definition, 2) the importance of outcome indicators, and 3) the ease of use of the measurement scale, and 4) the degree of content similarity between knowledge and self-management outcomes describing the same disease or clinical condition. **This second survey will ask you to confirm the importance of outcome indicators.**

To participate in this study, please click the URL at the bottom of this email. Your responses will be saved automatically in the secured server. However, an incomplete survey will be saved only for seven days, so please complete the survey within this time frame. The investigator will send a reminder email if you do not complete the survey. The deadline for completing this survey is June 26, 2015.

You will be paid $20 (check) via mail for full participation in this survey. Your mailing address is required after completing this survey. If you do not turn in a form for compensation, it will be not paid.

Taking part in this research study is completely voluntary. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

If you have any questions about the research study itself, please contact Hyunkyoung Oh at 319-855-8613 or by email at hyunkyoung-oh@uiowa.edu; or Sue Moorhead at 319-335-7110 or by email at sue-moorhead@uiowa.edu.

Thank you very much for your consideration. You can receive the summary results of the first and second surveys at the end of this project.

Sincerely,
Hyunkyoung Oh, PhD (c), RN
Sue Moorhead, PhD, RN, FAAN

If you want to take part in this survey, please click the link below. Your completion of the survey will be considered your consent to participate.

LINK TO SURVEY GOES HERE

[The URL address]

If you have questions about the rights of research subjects, please contact the Human

FOR IRB USE ONLY
$STAMP_IRB
$STAMP_IRB_ID
$STAMP_APPRV_DT
$STAMP_EXP_DT

Subjects Office, 105 Hardin Library for the Health Sciences, 600 Newton Rd, The University of Iowa, Iowa City, IA 52242-1098, (319) 335-6564, or e-mail irb@uiowa.edu. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

APPENDIX C: APPROVAL BY INSTITUTIONAL REVIEW BOARD

THE UNIVERSITY OF IOWA

Human Subjects Office/
Institutional Review Board (IRB)
105 Hardin Library for the Health Sciences
600 Newton Road
Iowa City, Iowa 52242-1098
319-335-6564 *Fax* 319-335-7310
irb@uiowa.edu
http://research.uiowa.edu/hso

IRB ID #: 201405838

To: Hyunkyoung Oh

From: IRB-02 DHHS Registration # IRB00000100,
Univ of Iowa, DHHS Federalwide Assurance # FWA00003007

Re: Validation of Nursing-Sensitive Knowledge and Self-Management Outcomes for Adults with Cardiovascular Diseases and Diabetes

---

Approval Date: 09/02/14

Next IRB Approval Due Before: N/A

Type of Application:	**Type of Application Review:**	**Approved for Populations:**
☒ New Project	☐ Full Board:	☐ Children
☐ Continuing Review	Meeting Date:	☐ Prisoners
☐ Modification	☐ Expedited	☐ Pregnant Women, Fetuses, Neonates
	☒ Exempt	

Source of Support:

This approval has been electronically signed by IRB Chair:
Janet Karen Williams, PHD
09/02/14 1137

OFFICE OF THE VICE PRESIDENT FOR RESEARCH

IRB Approval: IRB approval indicates that this project meets the regulatory requirements for the protection of human subjects. IRB approval does not absolve the principal investigator from complying with other institutional, collegiate, or departmental policies or procedures.

Agency Notification: If this is a New Project or Continuing Review application and the project is funded by an external government or non-profit agency, the original HHS 310 form, "Protection of Human Subjects Assurance Identification/IRB Certification/Declaration of Exemption," has been forwarded to the UI Division of Sponsored Programs, 100 Gilmore Hall, for appropriate action. You will receive a signed copy from Sponsored Programs.

Recruitment/Consent: Your IRB application has been approved for recruitment of subjects not to exceed the number indicated on your application form. If you are using written informed consent, the IRB-approved and stamped Informed Consent Document(s) are attached. Please make copies from the attached "masters" for subjects to sign when agreeing to participate. The original signed Informed Consent Document should be placed in your research files. A copy of the Informed Consent Document should be given to the subject. (A copy of the *signed* Informed Consent Document should be given to the subject if your Consent contains a HIPAA authorization section.) If hospital/clinic patients are being enrolled, a copy of the IRB approved Record of Consent form should be placed in the subject's electronic medical record.

Continuing Review: Federal regulations require that the IRB re-approve research projects at intervals appropriate to the degree of risk, but no less than once per year. This process is called "continuing review." Continuing review for non-exempt research is required to occur as long as the research remains active for long-term follow-up of research subjects, even when the research is permanently closed to enrollment of new subjects and all subjects have completed all research-related interventions and to occur when the remaining research activities are limited to collection of private identifiable information. Your project "expires" at 12:01 AM on the date indicated on the preceding page ("Next IRB Approval Due on or Before"). You must obtain your next IRB approval of this project on or before that expiration date. You are responsible for submitting a Continuing Review application in sufficient time for approval before the expiration date, however the HSO will send a reminder notice approximately 60 and 30 days prior to the expiration date.

Modifications: Any change in this research project or materials must be submitted on a Modification application to the IRB for prior review and approval, except when a change is necessary to eliminate apparent immediate hazards to subjects. The investigator is required to promptly notify the IRB of any changes made without IRB approval to eliminate apparent immediate hazards to subjects using the Modification/Update Form. Modifications requiring the prior review and approval of the IRB include but are not limited to: changing the protocol or study procedures, changing investigators or funding sources, changing the Informed Consent Document, increasing the anticipated total number of subjects from what was originally approved, or adding any new materials (e.g., letters to subjects, ads, questionnaires).

Unanticipated Problems Involving Risks: You must promptly report to the IRB any serious and/or unexpected adverse experience, as defined in the UI Investigator's Guide, and any other unanticipated problems involving risks to subjects or others. The Reportable Events Form (REF) should be used for reporting to the IRB.

Audits/Record-Keeping: Your research records may be audited at any time during or after the implementation of your project. Federal and University policies require that all research records be maintained for a period of three (3) years following the close of the research project. For research that involves drugs or devices seeking FDA approval, the research records must be kept for a period of three years after the FDA has taken final action on the marketing application.

Additional Information: Complete information regarding research involving human subjects at The University of Iowa is available in the "Investigator's Guide to Human Subjects Research." Research investigators are expected to comply with these policies and procedures, and to be familiar with the University's Federalwide Assurance, the Belmont Report, 45CFR46, and other applicable regulations prior to conducting the research. These documents and IRB application and related forms are available on the Human Subjects Office website or are available by calling 335-6564.

APPENDIX D: TABLES FOR CONTENT VALIDITY OF THE 12 NOC OUTCOMES

Table D-1. Results of 1st and 2nd Rounds about Knowledge: Chronic Disease Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator Ratios				Percent of			
								Disagree		Discard	
				P1	P2	Total	*p*	P1	P2	P1	P2
184701	19	Cause and contributing factors	Critical	.821	.806	.813	.877	-[a]	-	-	-
184702	20	Usual course of disease	Critical	.821	.806	.813	.836	-	-	-	-
184703	2	Benefits of disease management	Critical	1.00	.917	.953	.236	-	-	-	-
184704	6	Signs and symptoms of chronic disease	Critical	.929	.861	.891	.414	-	-	-	-
184705	21	Signs and symptoms of disease progression +	Critical	.857	.778	.813	.518	25	-	-	-
184706	4	Signs and symptoms of complications	Critical	.964	.889	.922	.337	-	-	-	-
184707	1	Strategies to prevent complications	Critical	1.00	.944	.969	.207	-	-	-	-
184708	24	Strategies to balance activity and rest +	Supplemental	.821	.750	.781	.501	50	-	-	-
184709	11	Strategies to manage pain	Critical	.929	.833	.875	.245	-	-	-	-
184710	7	Available treatment options	Critical	.893	.889	.891	.953	-	-	-	-
184711	8	Correct use of prescribed medication	Critical	.929	.861	.891	.481	-	-	-	-
184712	15	Medication therapeutic effects	Critical	.893	.806	.844	.278	-	-	-	-
184713	13	Medication side effects	Critical	.893	.833	.859	.472	-	-	-	-
184714	23	Medication adverse effects +	Supplemental	.821	.778	.797	.660	75	-	-	-
184715	12	Potential medication interactions	Critical	.893	.861	.875	.743	-	-	25	-
184716	30	Required laboratory tests	Supplemental	.714	.667	.688	.642	50	25	-	-
184717	26	Procedures involved in treatment regimen	Supplemental	.786	.722	.750	.509	25	20	-	-
184718	9	Personal responsibilities for treatment regimen	Critical	.964	.833	.891	.099	-	20	-	-
184719	17	Importance of compliance with treatment regimen +	Critical	.893	.778	.828	.205	25	-	-	-
184720	27	Recommended immunizations +	Supplemental	.821	.694	.750	.229	-	20	25	-
184721	29	Cultural influences on compliance to treatment regimen	Supplemental	.750	.722	.734	.822	-	20	25	-

Table D-1 continued

184722	16	Prescribed diet	Critical	.893	.806	.844	.278	25	-	-	-
184723	25	Strategies for tobacco cessation	Supplemental	.786	.778	.781	.941	-	-	-	-
184724	10	Strategies to cope with adverse effects of disease	Critical	.893	.889	.891	.953	-	-	-	-
184725	18	Financial resources for assistance	Critical	.857	.806	.828	.579	-	20	-	-
184726	28	Available support groups +	Supplemental	.821	.694	.750	.047	50	20	-	-
184727	22	Available community resources +	Critical	.929	.722	.813	.001	25	40	-	-
184728	14	Reputable sources of chronic disease information related to disease	Critical	.893	.833	.859	.375	-	20	-	25
184729	5	When to obtain assistance from a health professional	Critical	1.00	.861	.922	.015	-	-	-	-
184730	3	Actions to take in an emergency	Critical	1.00	.917	.953	.102	-	-	-	-
		OCV score		.882	.811	.842					

The number of respondents in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-2. Results of 1st and 2nd Rounds about Self-Management: Chronic Disease

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P1	P2	Total	*p*	P1	P2	P1	P2
310201	37	Accepts diagnosis +	Supplemental	.786	.806	.797	.918	25	-	25	-[a]
310202	41	Seeks information about disease +	Supplemental	.750	.806	.781	.681	50	-	-	-
310203	5	Monitors signs and symptoms of disease	Critical	.964	.944	.953	.837	-	-	-	-
310204	10	Follows recommended precautions	Critical	.964	.889	.922	.351	-	-	-	-
310205	18	Seeks information about methods to prevent complications	Critical	.929	.861	.891	.536	25	20	-	-
310206	6	Monitors for signs and symptoms of complications	Critical	1.00	.917	.953	.299	-	-	-	-
310207	1	Reports signs and symptoms of complications	Critical	1.00	.972	.984	.758	-	-	-	-
310208	13	Uses symptom relief strategies	Critical	.929	.889	.906		-	-	-	-
310209	45	Identifies cultural beliefs that impact treatment +	Supplemental	.679	.806	.750	.606	25	40	25	-
310210	30	Discusses cultural beliefs that impact treatment with health provider	Critical	.893	.833	.859	.606	50	-	-	-
310211	14	Follows recommended treatment	Critical	.929	.889	.906	.606	-	-	-	-
310212	23	Performs prescribed procedure	Critical	.893	.861	.875	.681	-	-	-	-
310213	7	Uses treatment devices correctly	Critical	1.00	.917	.953	.299	-	-	-	-
310214	24	Monitors treatment therapeutic effects	Critical	.929	.833	.875	.174	-	20	-	-
310215	2	Monitors treatment side effects	Critical	1.00	.944	.969	.470	-	-	-	-
310216	48	Alters roles to meet treatment requirements	Supplemental	.750	.639	.688	.470	25	-	-	20
310217	38	Obtains required laboratory tests +	Supplemental	.857	.750	.797	.470	50	20	-	-
310218	15	Follows medication regimen	Critical	.964	.861	.906	.174	-	-	-	-
310219	34	Monitors medication therapeutic effects +	Critical	.893	.778	.828	.252	-	-	-	-
310220	19	Monitors medication side effects	Critical	.929	.861	.891	.408	-	-	-	-

Table D-2 continued

310221	20	Monitors medication adverse effects	Critical	.893	.889	.891	.758	-	40	25	-
310222	46	Uses only nonprescription medication approved by health professional +	Supplemental	.821	.694	.750	.252	25	40	25	-
310223	42	Seeks assistance for self-care	Supplemental	.786	.778	.781		25	20	-	-
310224	21	Follows recommended diet	Critical	.929	.861	.891	.408	25	-	-	-
310225	25	Follows recommended activity level	Critical	.857	.889	.875	.681	25	-	-	-
310226	26	Participates in recommended exercises	Critical	.857	.889	.875	.681	25	20	-	-
310227	11	Eliminates tobacco use	Critical	.929	.917	.922	.918	50	-	-	-
310228	43	Uses stress management strategies +	Supplemental	.714	.833	.781	.252	-	20	-	-
310229	39	Maintains optimum weight +	Supplemental	.714	.861	.797	.142	-	20	-	-
310230	47	Monitors vital signs	Supplemental	.750	.750	.750	.837	-	20	-	20
310231	40	Avoids behaviors that potentiate disease progression +	Supplemental	.679	.889	.797	.210	25	-	-	20
310232	3	Uses strategies to prevent complications	Critical	1.00	.944	.969	.470	-	-	-	-
310233	27	Adjusts life routine for optimal health	Critical	.929	.833	.875	.470	25	-	-	-
310234	8	Uses strategies to cope with effects of disease	Critical	.964	.944	.953		-	-	-	-
310235	35	Uses strategies to enhance comfort	Critical	.821	.806	.813		-	20	25	-
310236	31	Uses strategies to control pain	Critical	.857	.861	.859	.918	-	-	-	-
310237	32	Uses strategies to maintain adequate sleep	Critical	.893	.806	.844	.470	-	20	-	-
310238	22	Balances activity and rest	Critical	.893	.889	.891		25	40	-	-
310239	36	Obtains influenza seasonal vaccine +	Critical	.714	.889	.813	.351	50	-	50	-
310240	33	Obtains pneumonia vaccine	Critical	.893	.806	.844	.470	-	20	25	-
310241	44	Participates in prescribed educational program +	Supplemental	.821	.722	.766	.351	25	40	-	-
310242	28	Monitors changes in disease	Critical	.893	.861	.875	.681	-	-	-	-
310243	12	Uses reputable sources of information	Critical	.964	.889	.922	.351	-	-	-	-
310244	4	Participates in health care decisions	Critical	1.00	.944	.969	.758	-	-	-	-
310245	49	Uses case manager to coordinate care	Supplemental	.643	.694	.672	.681	25	20	25	-

Table D-2 continued

310246	29	Uses health care services congruent with needs	Critical	.857	.889	.875	.918	25	-	-	20
310247	9	Develops plan for medical emergencies	Critical	1.00	.889	.938	.142	25	-	-	-
310248	16	Obtains advice from health professional as needed	Critical	1.00	.833	.906	.023	-	-	-	-
310249	17	Keeps appointments with health professional	Critical	.964	.861	.906	.299	-	-	-	-
310250	50	Uses available community resources	Supplemental	.607	.694	.656	.299	-	-	-	20
310251	51	Uses support group +	Unnecessary	.536	.639	.594	.351	-	-	-	-
		OCV score		.874	.847	.859					

The number of respondents in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-3. Results of 1st and 2nd Rounds about Knowledge: Diabetes Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P1	P2	Total	*p*	P1	P2	P1	P2
182002	19	Role of diet in blood glucose control	Critical	.964	.889	.922	.351	-	-	-	-
182003	31	Prescribed meal plan	Critical	.929	.833	.875	.210	-	-	-	-
182004	25	Strategies to increase diet compliance	Critical	.893	.917	.906	.758	-	-	-	-
182005	26	Role of exercise in blood glucose control	Critical	.893	.917	.906	.758	-	-	-	-
182006	10	Hyperglycemia and related symptoms	Critical	1.00	.917	.953	.299	-	-	-	-
182007	11	Hyperglycemia prevention	Critical	1.00	.917	.953	.299	-	-	-	-
182008	20	Procedures to be followed in treating hyperglycemia	Critical	.964	.889	.922	.351	-	-	-	-
182009	4	Hypoglycemia and related symptoms	Critical	1.00	.944	.969	.470	-	-	-	-
182010	5	Hypoglycemia prevention	Critical	1.00	.944	.969	.470	-	-	-	-
182011	6	Procedures to be followed in treating hypoglycemia	Critical	.964	.972	.969	.918	-	-	-	-
182012	12	Importance of maintaining blood glucose level within target range	Critical	1.00	.917	.953	.299	-	-	-	-
182013	29	Impact of acute illness on blood glucose level	Critical	.929	.861	.891	.408	-	-	-	-
182015	2	Actions to take in response to blood glucose levels	Critical	1.00	.972	.984	.758	-	-	-	-
182016	7	Prescribed insulin regimen	Critical	1.00	.944	.969	.470	-	-	-	-
182018	21	Plan for rotation of injection sites	Critical	1.00	.861	.922	.142	-	-	-	-
182019	16	Onset, peak and duration of prescribed insulin	Critical	.929	.944	.938	.837	-	-	-	-
182020	3	Prescribed oral medication regimen	Critical	1.00	.972	.984	.758	-	-	-	-
182023	15	Preventive foot care practices	Critical	1.00	.917	.953	.299	-	-	-	-
182024	28	Benefits of disease management	Critical	.929	.889	.906	.606	-	-	-	-

Table D-3 continued

182027	8	Proper technique to draw up and administer insulin	Critical	1.00	.944	.969	.470	-	-	-	-
182028	36	Correct procedure for urine ketone testing +	Supplemental	.679	.806	.750	.408	25	-	-	20
182029	23	Importance of dilated eye exam and vision testing by an ophthalmologist	Critical	.929	.917	.922	.918	-	20	-	-
182030	34	Cause and contributing factors	Critical	.821	.833	.828	.918	25	-	-	-
182031	35	Signs and symptoms of early disease +	Critical	.786	.833	.813	.918	25	-	-	-
182032	32	Role of sleep in blood glucose control	Critical	.893	.833	.859	.606	-	-	-	-
182033	13	How to use a monitoring device	Critical	1.00	.917	.953	.299	-	-	-	-
182034	1	Correct use of insulin	Critical	1.00	1.00	1.00		-	-	-	-
182035	22	Proper disposal of syringes and needles	Critical	1.00	.861	.922	.142	-	-	-	-
182036	9	Correct use of prescribed medication	Critical	.964	.972	.969	.918	-	-	-	-
182037	27	Correct use of non-prescription medication	Critical	.964	.861	.906	.174	-	-	-	-
182038	17	Proper medication storage	Critical	1.00	.889	.938	.142	-	-	-	-
182039	33	Medication therapeutic effects	Critical	.893	.833	.859	.351	-	-	-	-
182040	30	Medication side effects	Critical	.964	.833	.891	.091	-	-	-	-
182041	18	Medication adverse effects *	Critical	.964	.917	.938	.536	-	20	25	-
182042	14	When to obtain assistance from a health professional	Critical	1.00	.917	.953	.299	-	-	-	-
182043	24	Reputable sources of diabetes information	Critical	1.00	.861	.922	.071	-	-	-	-
		OCV score		.951	.901	.923					

The number of respondents in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-4. Results of 1st and 2nd Round about Self-Management: Diabetes

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P1	P2	Total	*p*	P1	P2	P1	P2
161901	24	Accepts diagnosis	Critical	.929	.833	.875	.351	-[a]	20	-	-
161902	32	Seeks information about methods to prevent complications +	Critical	.929	.778	.844	.091	-	-	-	-
161903	13	Performs preventive foot care practices	Critical	.964	.944	.953		-	-	-	-
161904	14	Obtains dilated vision examination as recommended	Critical	.964	.944	.953		-	20	-	20
161905	15	Adjusts medication when acutely ill	Critical	1.00	.917	.953	.299	-	-	-	-
161906	1	Reports non-healing breaks in skin to primary care provider	Critical	1.00	1.00	1.00		-	-	-	-
161907	9	Participates in health care decisions	Critical	1.00	.944	.969	.470	-	-	-	-
161908	2	Participates in prescribed educational program	Critical	1.00	.972	.984	.758	-	-	-	-
161909	3	Performs treatment regimen as prescribed	Critical	1.00	.972	.984	.758	-	-	-	-
161910	4	Performs correct procedure for blood glucose testing	Critical	1.00	.972	.984	.758	-	-	-	-
161911	5	Monitors blood glucose	Critical	1.00	.972	.984	.758	-	-	-	-
161912	10	Treats symptoms of hyperglycemia	Critical	1.00	.944	.969	.470	-	-	-	-
161913	17	Treats symptoms of hypoglycemia	Critical	.893	.917	.906	.758	-	-	-	-
161914	19	Monitors frequency of hypoglycemia episodes	Critical	.893	.889	.891		-	-	-	-
161915	11	Reports symptoms of complications	Critical	1.00	.944	.969	.470	-	-	-	-
161916	33	Uses diary to monitor blood glucose level over time +	Critical	.964	.750	.844	.023	-	40	-	-
161917	28	Uses preventive measures to reduce risk for complications	Critical	.857	.861	.859	.837	25	20	-	-

Table D-4 continued

161919	39	Monitors urinary glucose and ketones +	Supplemental	.821	.778	.797	.681	-	-	-	20
161920	42	Follows recommended diet	Supplemental	.750	.750	.750		50	20	-	-
161921	37	Follows recommended activity level	Critical	.821	.806	.813	.918	25	20	-	-
161922	38	Monitors body weight	Critical	.821	.806	.813		-	20	-	-
161923	20	Uses effective weight control strategies	Critical	.893	.889	.891		-	40	-	-
161924	25	Maintains optimum weight	Critical	.893	.861	.875	.681	50	60	-	-
161925	44	Follows recommendations for alcohol use +	Supplemental	.500	.722	.625	.351	-	-	-	20
161926	21	Participates in smoking cessation regimen	Critical	.929	.861	.891	.408	-	-	-	-
161927	18	Participates in recommended exercise	Critical	1.00	.833	.906	.023	-	-	-	-
161928	35	Performs usual life routine +	Critical	.893	.778	.828	.174	-	20	25	-
161929	6	Uses correct procedure for insulin administration	Critical	1.00	.972	.984	.758	-	-	-	-
161930	12	Stores insulin correctly	Critical	1.00	.944	.969	.470	-	-	-	-
161931	7	Obtains required medication	Critical	1.00	.972	.984	.758	-	-	-	-
161932	8	Uses medication as prescribed	Critical	1.00	.972	.984	.758	-	-	-	-
161933	26	Monitors medication therapeutic effects	Critical	.929	.833	.875	.351	-	-	-	-
161934	22	Rotates injection sites	Critical	.964	.833	.891	.299	-	-	-	-
161935	40	Uses only nonprescription medication approved by health professional	Supplemental	.786	.778	.781	.918	-	-	25	20
161937	30	Uses health care services congruent with needs	Critical	.857	.861	.859		50	20	-	-
161938	27	Reports need for financial assistance	Critical	.893	.861	.875	.837	-	40	-	-
161939	34	Keeps appointments with health professional	Critical	.821	.861	.844	.681	-	-	-	-
161940	31	Maintains plan for medical emergencies	Critical	.893	.833	.859	.470	25	-	-	-
161941	29	Obtains health care if blood glucose levels fluctuate outside of recommendations	Critical	.857	.861	.859		50	20	-	-
161942	23	Adjusts life routine for optimal health	Critical	.964	.833	.891	.299	-	20	-	-
161943	16	Obtains preconception counseling	Critical	.964	.917	.938	.536	-	-	-	-

Table D-4 continued

161944	43	Monitors for signs and symptoms of depression	Supplemental	.714	.778	.750	.606	25	20	-	20
161945	36	Obtains influenza seasonal vaccine +	Critical	.714	.917	.828	.252	25	20	50	-
161946	41	Obtains pneumonia vaccine +	Supplemental	.714	.806	.766	.408	-	40	25	-
		OCV score		.904	.874	.887					

The number of respondents in P1:7, P2:9 (1st round), and P1: 4, P2: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-5. Results of 1st and 2nd Rounds about Knowledge: Cardiac Disease Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P3	P4	Total	*p*	P3	P4	P3	P4
183001	36	Usual course of disease	Supplemental	.750	.688	.712	.622	25	25	50	25
183002	14	Signs and symptoms of early disease	Critical	.900	.813	.846	.724				
183003	1	Signs and symptoms of worsening disease	Critical	1.00	.938	.962	.524				
183004	5	Benefits of disease management	Critical	.900	.938	.923	.524		25		
183005	2	Strategies to reduce risk factors	Critical	.950	.969	.962	.833				
183006	22	Importance of completing cardiac rehabilitation	Critical	.800	.844	.827	.724				
183007	13	Family's role in treatment plan	Critical	.850	.875	.865	.943				
183008	15	Methods to measure blood pressure +	Critical	.950	.781	.846	.171		25		
183009	7	Strategies to limit sodium intake	Critical	.950	.875	.904	.435	25			
183010	30	Benefits of following a low-fat, low-cholesterol diet +	Supplemental	.900	.656	.750	.171	50		25	
183011	17	Strategies to increase diet compliance	Critical	.850	.844	.846	.943				
183012	26	Strategies to limit fluid intake +	Supplemental	.950	.688	.789	.171	50	25		
183013	27	Importance of monitoring weight +	Supplemental	.900	.719	.789	.284	50	25		
183014	31	Importance of alcohol restrictions +	Supplemental	.850	.688	.750	.284	25		25	
183015	9	Importance of tobacco abstinence	Critical	.800	.938	.885	.435	25			
183017	3	Benefits of regular exercise	Critical	.950	.938	.942	.943		25		
183018	18	Energy conservation techniques +	Critical	.950	.781	.846	.284		50		
183019	23	Guidelines for sexual activity	Critical	.850	.813	.827	.833				
183020	34	Potential sexual difficulties	Supplemental	.750	.750	.750	.943	25	75	50	
183021	11	Medication therapeutic effects	Critical	.900	.875	.885	.943				
183022	4	Strategies to manage stress	Critical	.900	.969	.942	.435				

Table D-5 continued

183025	25	Care options for assistance with medical emergencies	Critical	.800	.813	.808	.943	25		
183026	35	Importance of family learning cardiopulmonary resuscitation +	Supplemental	.800	.719	.750	.524	50		
183027	28	Cultural influences on compliance to treatment regimen +	Supplemental	.700	.844	.789	.284	25	25	25
183028	8	Strategies to decrease treatment side effects	Critical	.950	.844	.885	.354		25	
183029	16	Methods to monitor heart rate +	Critical	.950	.781	.846	.171		25	
183030	32	Recommended work activity +	Supplemental	.850	.688	.750	.171	25	50	25
183031	10	Recommended physical activity	Critical	.950	.844	.885	.354			
183032	33	Recommended leisure activity +	Supplemental	.800	.719	.750	.524		50	50
183033	12	Medication side effects	Critical	.900	.875	.885	.943		25	
183034	19	Medication adverse effects +	Critical	.950	.781	.846	.171		25	
183035	6	When to obtain assistance from a health professional	Critical	.900	.938	.923	.724			
183036	29	Available support groups +	Supplemental	.750	.813	.789	.943	25	25	25
183037	24	Reputable sources of cardiac disease information	Critical	.850	.813	.827	.833	50		
183038	20	Importance of obtaining influenza seasonal vaccine	Critical	.900	.813	.846	.524	25	50	
183039	21	Importance of obtaining pneumonia vaccine	Critical	.900	.813	.846	.524	25	50	
		OCV score		.876	.819	.841				

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-6. Results of 1st and 2nd Rounds about Self-Management: Cardiac Disease

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P3	P4	Total	*p*	P3	P4	P3	P4
161701	36	Accepts diagnosis +	Supplemental	.900	.719	.789	.354	50	25	-[a]	50
161702	24	Seeks information about methods to maintain cardiovascular health	Critical	.850	.844	.846	.724	25	-	-	-
161703	6	Participates in health care decisions	Critical	.950	.906	.923	.833	-	25	-	-
161704	25	Participates in prescribed cardiac rehabilitation	Critical	.800	.875	.846	.622	-	25	-	-
161705	34	Performs treatment regimen as prescribed +	Critical	.850	.781	.808	.943	-	25	-	-
161706	1	Monitors symptom onset	Critical	.950	.969	.962	.833	25	-	-	-
161707	7	Monitors symptom persistence	Critical	.900	.938	.923	.724	25	-	-	-
161708	8	Monitors symptom severity	Critical	.900	.938	.923	.724	25	-	-	-
161709	2	Monitors symptom frequency	Critical	.950	.938	.942	.943	25	-	-	-
161710	13	Reports symptoms of worsening disease	Critical	.900	.844	.865	.833	-	-	-	-
161711	12	Reports signs and symptoms of depression	Critical	.850	.906	.885	.833	25	-	-	-
161712	45	Uses diary to monitor symptoms over time +	Supplemental	.750	.594	.654	.222	-	25	-	-
161713	3	Uses preventive measures to reduce risk of complications	Critical	.950	.938	.942	.943	-	-	-	-
161714	9	Uses symptom relief methods	Critical	.900	.906	.904	.943	25	-	-	-
161716	37	Monitors pulse rate and rhythm +	Supplemental	.750	.813	.789	.724	25	75	-	-
161717	26	Monitors blood pressure	Critical	.800	.875	.846	.524	-	-	-	-
161718	15	Limits sodium intake	Critical	.850	.875	.865		25	25	-	-
161719	39	Limits fat and cholesterol intake +	Supplemental	.800	.750	.769		25	50	25	-
161720	16	Follows recommended diet	Critical	.850	.875	.865	.833	-	-	-	-
161721	27	Follows fluid restrictions	Critical	.900	.813	.846	.435	-	25	-	-
161722	44	Monitors effects of stimulants +	Supplemental	.850	.563	.673	.045	-	-	50	-

Table D-6 continued

161723	17	Monitors body weight	Critical	.900	.844	.865	.724	-	-	-	-
161724	28	Uses effective weight control strategies	Critical	.850	.844	.846	.943	-	25	25	-
161725	29	Maintains optimum weight	Critical	.850	.844	.846	.833	50	25	-	-
161726	32	Follows recommendations for alcohol use	Critical	.800	.844	.827	.833	50	25	-	-
161727	4	Participates in smoking cessation regimen	Critical	.850	1.00	.942	.284	25	-	-	-
161728	40	Participates in recommended exercise +	Supplemental	.800	.750	.769		50	75	-	-
161729	35	Uses energy conservation techniques +	Critical	.850	.781	.808	.524	25	25	-	-
161730	18	Balances activity and rest	Critical	.850	.875	.865	.943	25	25	-	-
161731	43	Performs usual life routine	Supplemental	.650	.719	.692	.943	-	25	75	50
161732	42	Follows recommendations for sexual activity	Supplemental	.700	.750	.731	.943	-	25	50	-
161733	10	Obtains required medication	Critical	.800	.969	.904	.171	-	-	-	-
161734	5	Uses medication as prescribed	Critical	.900	.969	.942	.435	-	-	-	-
161735	30	Monitors prescribed medication therapeutic effects	Critical	.800	.875	.846	.524	-	-	-	-
161736	38	Uses only nonprescription medication approved by health professional +	Supplemental	.700	.844	.789	.284	25	50	25	25
161737	19	Uses stress management strategies	Critical	.850	.875	.865	.833	25	25	-	-
161739	31	Uses health care services congruent with needs	Critical	.850	.844	.846	.943	25	-	-	-
161740	41	Participates in screening for cholesterol	Supplemental	.750	.781	.769	.622	-	25	50	-
161741	33	Reports need for financial assistance +	Critical	.700	.906	.827	.093	50	-	25	-
161742	22	Keeps appointments with health professional	Critical	.850	.875	.865	.833	-	-	-	-
161743	23	Maintains plan for medical emergencies	Critical	.800	.906	.865	.354	-	-	-	-
161744	14	Obtains health care when warning signs occur	Critical	.850	.875	.865	.524	-	-	-	-
161745	11	Adjusts life routine for optimal health	Critical	.950	.875	.904	.435	-	25	-	-
161746	20	Obtains influenza seasonal vaccine	Critical	.850	.875	.865	.943	25	25	-	-
161747	21	Obtains pneumonia vaccine	Critical	.850	.875	.865	.943	25	25	-	-
		OCV score		.840	.850	.846					

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).

+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-7. Results of 1st and 2nd Rounds about Knowledge: Hypertension Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P3	P4	Total	*p*	P3	P4	P3	P4
183701	25	Normal range for systolic blood pressure +	Critical	.950	.719	.808	.093	-[a]	25	-	-
183702	1	Normal range for diastolic blood pressure	Critical	.950	.938	.942	.943	-	25	-	-
183703	6	Target blood pressure	Critical	.900	.906	.904	.943	-	-	-	-
183704	26	Methods to measure blood pressure +	Critical	.850	.781	.808	.943	-	-	-	-
183705	12	Potential complications of hypertension	Critical	.900	.875	.885	.833	-	-	-	-
183706	15	Available treatment options	Critical	.850	.875	.865	.833	25	-	-	-
183707	4	Benefits of long-term treatment	Critical	.950	.906	.923	.833	-	-	-	-
183708	2	Signs and symptoms of exacerbation of hypertension	Critical	.950	.938	.942	.943	-	-	-	-
183709	16	Correct use of prescribed medication	Critical	.900	.844	.865	.524	-	-	-	-
183710	13	Medication therapeutic effects	Critical	.950	.844	.885	.354	-	-	-	-
183711	14	Medication side effects	Critical	1.00	.813	.885	.065	-	-	-	-
183712	7	Medication adverse effects	Critical	.950	.875	.904	.833	-	25	-	-
183713	3	Importance of adherence to treatment	Critical	.900	.969	.942	.435	-	25	-	-
183714	20	Importance of informing health professional of all current medication	Critical	.850	.844	.846	.833	-	25	-	-
183715	27	Importance of keeping follow-up appointments +	Critical	.950	.719	.808	.093	25	25	-	-
183716	22	Benefits of ongoing self-monitoring	Critical	.800	.844	.827	.622	-	50	-	-
183717	21	Recommended schedule for monitoring blood pressure	Critical	.850	.844	.846	.943	-	-	-	-
183718	28	Benefits of weight loss +	Critical	.850	.781	.808	.622	25	25	-	-
183719	23	Benefits of lifestyle modifications	Critical	.850	.813	.827	.943	25	25	-	-

Table D-7 continued

183720	30	Strategies to manage stress +	Supplemental	.850	.750	.789	.435	-	50	-	-
183721	29	Prescribed diet +	Critical	.850	.781	.808	.622	25	25	-	-
183722	8	Strategies to change dietary habits	Critical	.900	.906	.904	.943	25	25	-	-
183723	9	Strategies to limit sodium intake	Critical	.900	.906	.904	.833	25	25	-	-
183724	10	Strategies to increase diet compliance	Critical	.950	.875	.904	.622	25	25	-	-
183725	24	Adverse health effects of alcohol use	Critical	.850	.813	.827	.724	50	-	-	-
183726	11	Importance of tobacco abstinence	Critical	.900	.906	.904	.943	25	25	-	-
183727	5	Benefits of regular exercise	Critical	1.00	.875	.923	.284	-	25	-	-
183728	17	Reputable sources of hypertension information	Critical	.950	.813	.865	.354	25	-	-	-
183729	31	Available support groups	Supplemental	.600	.781	.712	.435	-	25	-	-
183730	18	When to obtain assistance from a health professional +	Critical	.750	.938	.865	.222	-	-	-	-
183731	19	Benefits of disease management	Critical	.900	.844	.865	.833	-	25	-	-
		OCV score		.889	.849	.864					

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-8. Results of 1st and 2nd Rounds about Self-Management: Hypertension

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P3	P4	Total	*p*	P3	P4	P3	P4
310701	4	Monitors blood pressure	Critical	.950	.875	.904	.622	-[a]	25	-	-
310702	2	Performs correct procedure for blood pressure measurement	Critical	.950	.906	.923	.622	-	25	-	-
310703	24	Checks calibration of home blood pressure device +	Supplemental	.800	.750	.769	.943	-	-	-	25
310704	7	Maintains target blood pressure	Critical	.900	.875	.885	.943	-	-	-	-
310705	1	Uses medication as prescribed	Critical	.950	.969	.962	.833	-	-	-	-
310706	15	Monitors medication therapeutic effects +	Critical	.950	.781	.846	.093	-	-	-	-
310707	11	Monitors medication adverse effects	Critical	.950	.813	.865	.127	-	25	-	-
310708	8	Monitors medication side effects	Critical	.900	.875	.885	.622	-	25	-	-
310709	16	Uses only nonprescription medication approved by health professional	Critical	.850	.844	.846	.943	25	-	-	-
310710	12	Participates in recommended exercises	Critical	.900	.844	.865	.724	-	-	-	-
310711	17	Uses strategies for weight reduction	Critical	.850	.844	.846	.943	25	-	-	-
310712	9	Maintains optimum body weight	Critical	.900	.875	.885	.943	-	25	-	-
310713	21	Follows recommended diet +	Critical	.700	.875	.808	.171	25	-	-	-
310714	5	Limits sodium intake	Critical	.950	.875	.904	.622	25	-	-	-
310715	13	Limits high calorie fluids	Critical	.950	.813	.865	.354	50	-	-	-
310716	19	Limits high calorie snacks +	Critical	.900	.781	.827	.284	50	-	-	-
310717	27	Decreases food portions	Supplemental	.750	.750	.750		-	25	25	25
310718	20	Limits caffeine consumption	Critical	.800	.844	.827	.724	25	25	-	25

Table D-8 continued

310719	22	Uses stress management strategies +	Supplemental	.800	.781	.789	.833	-	50	-	-
310720	3	Uses relaxation techniques	Critical	.800	1.00	.923	.284	50	25	-	-
310721	6	Participates in smoking cessation regimen	Critical	.800	.969	.904	.354	25	-	-	-
310722	31	Eliminates tobacco use	Supplemental	.700	.719	.712	.833	25	75	25	-
310723	29	Follows recommendations for alcohol use	Supplemental	.750	.719	.731	.833	25	25	-	-
310724	32	Uses strategies to maintain adequate sleep	Supplemental	.700	.688	.692	.724	-	50	-	-
310725	30	Uses diary to monitor blood pressure over time +	Supplemental	.800	.688	.731	.435	-	25	-	-
310726	25	Monitors for complications of hypertension +	Supplemental	.800	.750	.769	.943	50	50	25	-
310727	14	Contacts health provider when not in target range +	Critical	.750	.938	.865	.222	25	-	-	-
310728	18	Keeps appointments with health professional	Critical	.800	.875	.846	.524	-	-	-	-
310729	33	Uses support group +	Supplemental	.500	.750	.654	.284	-	25	-	25
310730	10	Uses reputable sources of information	Critical	.900	.875	.885	.943	25	-	-	-
310731	26	Uses available community resources +	Supplemental	.700	.813	.769	.354	-	25	25	-
310732	28	Seeks financial resources	Supplemental	.600	.844	.750	.222	-	-	50	-
310733	23	Uses social support +	Supplemental	.650	.875	.789	.435	-	50	-	-
OCV score				.817	.832	.826					

The number of respondents were in P3:5, P4:8 (1st round), and P3: 4, P4: 4 (2nd round).
+ Differently evaluated by both panels in the first round.
a zero (0) percent of disagree/discard

Table D-9. Results of 1st and 2nd Rounds about Knowledge: Coronary Artery Disease Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P5	P6	Total	*p*	P5	P6	P5	P6
184901	24	Usual course of disease	Critical	.857	.850	.853		-	-	-	-
184902	11	Cause and contributing factors	Critical	.929	.875	.897	.669	-	-	-	-
184903	5	Signs and symptoms of early disease	Critical	.929	.950	.941	.962	-	-	-	-
184904	1	Signs and symptoms of worsening disease	Critical	1.00	.975	.985	.740	-	-	-	-
184905	20	Types of pain associated with disease	Critical	.929	.825	.868	.315	-	20	-	-
184906	4	Strategies to reduce risk factors	Critical	1.00	.925	.956	.315	-	-	-	-
184907	21	Importance of completing cardiac rehabilitation	Critical	.857	.875	.868	.813	40	-	-	-
184908	15	Methods to monitor blood pressure	Critical	.929	.850	.882	.417	20	-	-	-
184909	16	Methods to monitor heart rate	Critical	.929	.850	.882	.417	20	20	-	-
184910	31	Methods to monitor heart rhythm +	Supplemental	.857	.750	.794	.475	20	80	-	-
184911	2	Benefits of disease management	Critical	.964	1.00	.985	.669	-	-	-	-
184912	7	Medication schedule	Critical	.893	.950	.927	.740	-	-	-	-
184913	6	Medication therapeutic effects	Critical	.964	.925	.941	.601	-	-	-	-
184914	10	Medication side effects	Critical	.929	.900	.912	.536	-	-	-	-
184915	12	Medication adverse effects	Critical	1.00	.825	.897	.088	20	-	-	-
184916	26	Importance of limiting sodium intake	Critical	.857	.825	.838	.601	-	-	-	-
184917	41	Benefits of following a low-fat, low-cholesterol diet	Supplemental	.714	.675	.691	.417	20	-	-	-
184918	25	Strategies to increase diet compliance	Critical	.821	.875	.853	.669	-	20	20	-
184919	13	Strategies to maintain optimal weight	Critical	.929	.875	.897	.364	20	-	20	-
184920	17	Benefits of maintaining optimal weight	Critical	.929	.850	.882	.475	20	20	20	-
184921	35	Importance of alcohol restrictions +	Supplemental	.821	.725	.765	.364	-	-	-	-
184922	3	Importance of tobacco abstinence	Critical	1.00	.950	.971	.536	-	-	-	-

Table D-9 continued

184923	22	Rationale for regular exercise	Critical	.893	.850	.868	.475	-	-	20	-
184924	8	Guidelines for activity level	Critical	.964	.900	.927	.417	20	20	-	-
184925	27	Guidelines for sexual activity +	Critical	.929	.750	.824	.088	20	40	-	-
184926	14	Strategies to prevent blood clots	Critical	1.00	.825	.897	.088	-	-	-	-
184927	18	Adverse health effects of stress on coronary artery disease	Critical	.964	.825	.882	.193	20	40	-	-
184928	23	Adverse health effects of anger on coronary artery disease	Critical	.929	.825	.868	.364	20	60	-	-
184929	28	Strategies to manage stress	Critical	.821	.825	.824	.887	-	-	20	-
184930	29	Strategies to manage anger	Critical	.821	.800	.809	.740	-	-	20	-
184931	42	Importance of obtaining influenza seasonal vaccine	Supplemental	.750	.650	.691	.315	20	20	-	-
184932	37	Importance of obtaining pneumonia vaccine +	Supplemental	.821	.675	.735	.133	20	20	-	-
184933	32	Importance of periodic screening of cholesterol level +	Supplemental	.821	.775	.794	.161	-	-	-	-
184934	33	Importance of periodic screening of blood glucose level +	Supplemental	.750	.800	.779	.813	20	-	-	-
184935	38	Rationale for controlling blood glucose level	Supplemental	.750	.725	.735	.417	-	-	20	-
184936	9	When to obtain assistance from a health professional	Critical	.964	.900	.927	.601	-	-	-	-
184937	19	Care options for assistance with medical emergencies	Critical	.929	.850	.882	.315	20	-	-	-
184938	36	Family's role in treatment plan +	Supplemental	.821	.700	.750	.364	-	20	20	-
184939	39	Importance of family learning cardiopulmonary resuscitation +	Supplemental	.821	.650	.721	.315	-	20	40	-
184940	34	Cultural influences on compliance to treatment regimen +	Supplemental	.679	.850	.779	.417	20	20	-	-

Table D-9 continued

184941	40	Available support groups	Supplemental	.643	.750	.706	.315	20	20	-	-
184942	30	Reputable sources of cardiac disease information +	Critical	.786	.825	.809	.740	20	20	-	-
		OCV score		.878	.830	.850					

The number of respondents were in P5: 7, P6: 10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-10. Results of 1st and 2nd Rounds about Self-Management: Coronary Artery Disease

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator ratios				Percent of			
								Disagree		Discard	
				P5	P6	Total	*p*	P5	P6	P5	P6
310401	33	Accepts diagnosis	Critical	.821	.800	.809	.813	-	20	20	-
310402	26	Seeks information about methods to manage disease +	Critical	.964	.750	.838	.043	-	40	-	-
310403	23	Participates in health care decisions	Critical	.786	.900	.853	.475	-	20	-	-
310404	18	Participates in prescribed cardiac rehabilitation	Critical	.893	.900	.897		-	-	-	-
310405	14	Performs treatment regimen as prescribed	Critical	.929	.900	.912	.962	-	-	-	-
310406	39	Monitors heart rate and rhythm +	Supplemental	.893	.725	.794	.161	20	20	-	-
310407	27	Monitors blood pressure	Critical	.893	.800	.838	.270		20	-	-
310408	15	Monitors for pain	Critical	1.00	.850	.912	.193	-	-	-	-
310409	11	Monitors for shortness of breath	Critical	1.00	.875	.927	.193	-	-	-	-
310410	9	Monitors symptom onset	Critical	1.00	.900	.941	.315	-	20	-	-
310411	3	Monitors symptom persistence	Critical	1.00	.925	.956	.315	-	20	-	-
310412	10	Monitors symptom severity	Critical	1.00	.900	.941	.193	-	20	-	-
310413	4	Monitors symptom frequency	Critical	1.00	.925	.956	.315	-	20	-	-
310414	1	Reports symptoms of worsening disease	Critical	1.00	1.00	1.00		-	-	-	-
310415	40	Uses diary to monitor symptoms over time +	Supplemental	.857	.725	.779	.536	20	40	-	-
310416	19	Uses symptom relief methods	Critical	.893	.900	.897	.887	-	-	-	-
310417	5	Uses preventive strategies to reduce risk of complications	Critical	1.00	.925	.956	.315	-	-	-	-
310418	12	Obtains health care for change in symptoms	Critical	.964	.900	.927	.601	-	-	-	-
310419	2	Uses medication as prescribed	Critical	1.00	.975	.985	.740	-	-	-	-
310420	13	Monitors medication therapeutic effects	Critical	.964	.900	.927	.417	-	20	-	-
310421	16	Monitors medication side effects	Critical	.964	.875	.912	.364	-	-	-	-

Table D-10 continued

310422	20	Avoids stopping medication suddenly	Critical	.857	.925	.897	.740	-	-	-	-
310423	34	Uses only nonprescription medication approved by health professional +	Critical	.857	.775	.809	.962	-	20	-	-
310424	24	Follows prescribed diet	Critical	.821	.875	.853		20	20	-	-
310425	28	Monitors effects of stimulants +	Critical	.786	.875	.838		-	20	-	-
310426	25	Uses effective weight control strategies	Critical	.893	.825	.853	.417	-	-	20	-
310427	35	Maintains optimum weight +	Critical	.857	.775	.809	.364	20	20	20	-
310428	29	Follows recommendations for alcohol use	Critical	.857	.825	.838	.887	-	-	-	-
310429	6	Eliminates tobacco use	Critical	1.00	.925	.956	.536	-	-	-	-
310430	41	Avoids second hand smoke	Supplemental	.786	.750	.765	.813	40	40	-	-
310431	17	Participates in recommended exercise	Critical	.929	.900	.912	.740	20	-	-	-
310432	36	Follows recommendations for sexual activity +	Critical	.857	.775	.809	.417	20	40	-	-
310433	21	Uses stress management strategies	Critical	.893	.875	.882	.887	-	-	20	-
310434	30	Uses anger management techniques	Critical	.857	.825	.838	.887	20	-	20	-
310435	42	Obtains influenza seasonal vaccine +	Supplemental	.714	.800	.765	.813	20	20	-	-
310436	37	Obtains pneumonia vaccine +	Critical	.857	.775	.809	.364	-	40	-	-
310437	32	Uses health care services congruent with needs +	Critical	.714	.900	.824	.315	-	20	-	-
310438	22	Participates in screening for cholesterol	Critical	.821	.900	.868	.887	-	40	-	-
310439	31	Participates in screening for blood glucose level	Critical	.821	.850	.838	.962	20	40	-	-
310440	43	Uses social support	Supplemental	.714	.700	.706	.887	20	20	-	-
310441	7	Keeps appointments with health professional	Critical	1.00	.925	.956	.315	-	20	-	-
310442	8	Maintains plan for medical emergencies	Critical	1.00	.925	.956	.315	-	20	-	-
310443	38	Adapts life routine for optimal health +	Critical	.679	.900	.809	.536	-	-	20	-
		OCV score		.893	.859	.873					

The number of respondents were in P5: 7, P6: 10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator / a zero (0) percent of disagree/discard

Table D-11. Results of 1st and 2nd Rounds about Knowledge: Lipid Disorder Management

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator Ratios				Percent of			
								Disagree		Discard	
				P5	P6	Total	*p*	P5	P6	P5	P6
185801	10	Cause and contributing factors	Critical	.964	.850	.897	.230	-	20	-[a]	-
185802	17	Signs and symptoms of complications	Critical	.857	.900	.882	.740	20	40	-	-
185803	11	Required laboratory tests for monitoring lipid levels	Critical	.964	.850	.897	.230	-	-	-	-
185804	12	Target lipid levels	Critical	.964	.850	.897	.230	-	-	-	-
185805	6	Benefits of lifestyle modifications	Critical	.964	.950	.956	.962	-	-	-	-
185806	3	Benefits of weight loss	Critical	1.00	.950	.971	.536	20	-	-	-
185807	13	Benefits of aerobic exercise	Critical	.821	.950	.897	.740	20	20	-	-
185808	7	Prescribed diet	Critical	1.00	.875	.927	.193	20	-	-	-
185809	1	Strategies to change dietary habits	Critical	1.00	1.00	1.00		-	-	-	-
185810	4	Correct use of prescribed medication	Critical	1.00	.950	.971	.536	-	-	-	-
185811	14	Potential medication interactions with food	Critical	.857	.925	.897	.740	-	20	-	-
185812	15	Medication therapeutic effects	Critical	.964	.850	.897	.230	-	-	-	-
185813	9	Medication side effects	Critical	.964	.875	.912	.230	-	-	-	-
185814	8	Medication adverse effects	Critical	.964	.900	.927	.417	20	-	-	-
185815	5	Importance of adherence to treatment	Critical	1.00	.950	.971	.536	-	20	-	-
185816	20	Recommendations for alcohol use +	Supplemental	.679	.825	.765	.601	-	-	-	-
185817	18	Importance of tobacco abstinence	Critical	.857	.900	.882	.740	-	-	-	-
185818	19	Reputable sources of hyperlipidemia information	Critical	.893	.850	.868	.601	-	20	-	-
185819	21	Available support groups	Supplemental	.643	.725	.691	.601	20	20	-	-

Table D-11 continued

185820	16	When to obtain assistance from a health professional	Critical	.893	.900	.897	.887	-	20	-	-
185821	2	Benefits of hyperlipidemia management	Critical	1.00	.975	.985	.740	-	-	-	-
		OCV score		.917	.895	.904					

The number of respondents were in P5: 7, P6: 10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

Table D-12. Results of 1st and 2nd Rounds about Self-Management: Lipid Disorder

Ind ID	Rank order	Indicators	Criteria	1st round				2nd round			
				Indicator Ratios				Percent of			
								Disagree		Discard	
				P5	P6	Total	*p*	P5	P6	P5	P6
310901	17	Seeks information about methods to manage disorder	Critical	.893	.800	.838	.601	-[a]	20	-	-
310902	7	Participates in health care decisions	Critical	.929	.950	.941	.813	-	20	-	-
310903	13	Discusses benefits of medication with health professional	Critical	.929	.850	.882	.315	20	20	-	-
310904	4	Obtains required laboratory tests	Critical	.964	.950	.956	.887	-	-	-	-
310905	10	Monitors lipid levels	Critical	.964	.900	.927	.417	-	20	-	-
310906	1	Adapts life routine for optimal health	Critical	1.00	.950	.971	.536	-	-	20	-
310907	18	Uses effective weight control-strategies	Critical	.821	.850	.838	.962	-	20	20	-
310908	14	Maintains optimum weight +	Critical	.786	.950	.882	.417	20	-	20	-
310909	20	Follows recommended diet +	Critical	.643	.950	.824	.161	-	-	-	-
310910	5	Limits fat and cholesterol intake	Critical	.929	.975	.956	.536	-	20	-	-
310911	15	Participates in recommended aerobic exercise	Critical	.929	.850	.882	.601	-	-	20	-
310912	6	Follows recommendations for alcohol use	Critical	.964	.950	.956	.887	-	-	-	-
310913	16	Eliminates tobacco use +	Critical	.750	.950	.868	.364	-	-	-	-
310914	25	Avoids second hand smoke	Supplemental	.750	.750	.750		20	20	-	-
310915	22	Uses medication as prescribed	Critical	.821	.800	.809	.887	-	-	-	-
310916	2	Monitors medication therapeutic effects	Critical	1.00	.950	.971	.536	-	20	-	-
310917	19	Monitors medication adverse effects +	Critical	.679	.950	.838	.133	-	-	-	-
310918	23	Monitors medication side effects +	Critical	.679	.900	.809	.230	-	-	-	-
310919	24	Avoids stopping medication suddenly +	Critical	.857	.775	.809	.740	-	-	-	-

Table D-12 continued

310920	8	Uses only nonprescription medication approved by health professional	Critical	1.00	.900	.941	.315	-	20	-	-
310921	11	Monitors changes in general health	Critical	.964	.875	.912	.230	-	40	20	-
310922	9	Uses health care services congruent with needs	Critical	.964	.925	.941	.601	-	20	-	-
310923	12	Keeps appointments with health professional	Critical	.964	.875	.912	.230	-	20	-	-
310924	3	Uses significant others to support behavior changes	Critical	1.00	.950	.971	.536	-	40	20	-
310925	21	Uses available community resources	Critical	.857	.800	.824	.601	40	40	-	-
		OCV score		.881	.893	.888					

The number of respondents were in P5: 7, P6: 10 (1st round), and P5: 5, P6: 5 (2nd round).
+ Differently evaluated by both panels in the first round.
Ind Indicator
a zero (0) percent of disagree/discard

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