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**DEVELOPMENT OF COMPETENCY ASSESSMENT TOOL
FOR STUDENT-NURSES READINESS**

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ABSTRACT

Preparing students for the real world of work is a vital responsibility of higher education institutions. To determine their preparedness, assessment tools are necessary to verify whether students have attained certain levels of expected competencies. The institution does extremely feel the absence of an assessment tool to evaluate the nursing students' readiness for the world of work in the caring profession. This study developed a competency assessment tool fitted to Philippine nursing practice as a benchmark for student nurses to prepare them for expected competencies in the actual nursing practice. The study was anchored on the theory of Patricia Benner and the NCCS of 2012. Mixed methods exploratory design was utilized in the study. Fourteen expert nurses in the field of nursing practice were given open-ended questions based on the 11 key areas of responsibility. Thematic analysis and drawing of core ideas were employed that underwent content validity from another set of fourteen experts from the academe, clinical practice, and Commission on Higher Education. The final content validity was done through Lawshe Content validity ratio. More than 500 nurses answered the initial instrument after which exploratory factor analysis was conducted to identify the item indicators for each main construct of the proposed competency tool. There were 11 major themes and 141 performance indicators. Three major competencies are labeled as Client Care, Management and Leadership, and Research. The final tool which has undergone appropriate scientific processes will be used to assess the student nurses' competencies as to their readiness to the world of work.

Keywords: *Competency indicators, Client Care, Leadership, Research in health care*

Introduction

Care is an essential human need and is a requisite for any health care practitioner to possess the ability to care. One of the most important core values in the nursing profession is the value of caring, it is a character that requires the affective side of being human and the science of nurturing. The nurse assumes a caring role in the promotion of health, prevention of diseases, rehabilitation, and assists towards a peaceful death if recovery is not possible (CMO 14, Series of 2009). Nurses being at the forefront in the art of caring, are expected that when they work in the hospital, they possess the necessary beginning competencies to enable them to meet the ever-changing demands of the clinical environment. A solid and resilient nursing workforce is vital in every health organization because nurses serve as among the significant pillars in every health institution (International Council of Nurses, 2016). With this vital nursing role, the Department of Health conducts its yearly quality assurance inspection to ensure that not only are the number of nurses adequate but also to determine whether the nurses hired in hospitals are equipped with the proficiencies expected of a licensed nurse.

Given this scenario, the nursing profession has also undertaken various endeavors to meet the global demands in the delivery of quality health care and service. The Board of Nursing (BON) in collaboration with the Commission on Higher Education (CHED) issued CMO 14, Series of 2009, stipulating the 11 key areas of responsibilities for the nursing profession, to serve as a guide for the academe and hospitals in ensuring that these competencies are integrated into all modes of teaching, as well as in educational sessions and forums. Moreover, for the nursing profession to be at par with its ASEAN counterparts and also to be aligned with the profession in the context of the outcomes-based model, BON and CHED issued CMO 15, Series of 2017. The directive specifically defined the Policies, Standards, and Guidelines in implementing the shift from competency-based to outcomes-based stipulating the core competencies of Bachelor of Science in nursing graduates.

While it is very clear in the mandate that the stipulated competencies be covered in the curriculum, sadly, the actual experiences of nursing students while in practicum do not afford such opportunity. For reasons like institutional interruptions of supposed student hospital exposure, limited areas of exposure, the ample amount of mentoring from clinical instructor/staff nurses, and the necessary resources available in hospitals which are vital components for the development of such competencies. If students are not provided or will lack the opportunity to ample exposure to basic nursing skills, they may gain insufficient experience for even minimal competence (Bradshaw and Merriman, 2008; Pijl-Zieber et al, 2013)

The academe utilizes assessment tools in the form of a procedural checklist to measure skill competency as well as rubrics to evaluate each competency expected of student nurses to develop.

Assessments and evaluations are conducted along the continuum from the students' first year in the curriculum up to graduation. The purpose is to ensure that the nursing graduate must have developed the vital competencies ready for entry-level employment. CHED emphasized the importance of such evaluation tools and are deemed to be very necessary, in that such competency assessment should continue up to employment. The present tools utilized vary from one institution to another, most hospitals use assessment tools for quality assurance, but for quality improvement per se, assessment tools are utilized but may be obsolete or have not undergone content validation. Bridging the gap from the academe to the clinical setting might be difficult considering that the curriculum is ever-changing (the shift from competency-based to outcomes-based). Therefore, there is a need for schools and health care institutions to work together in ensuring that competency assessments are standardized and are aligned with the Standards of Professional Nursing Practice in the Philippines as mandated by the Philippine Board of Nursing, CHED, ASEAN Qualification Framework, and International Council of Nurses (ICN).

Fukada (2018) states that Nursing competency includes core abilities that are required for fulfilling one's role as a nurse, moreover Fukada described competence as an ability acquired through experience and learning. The concept of competence is two-fold: 1) potential abilities that may work effectively under certain circumstances and 2) motivation to show one's usefulness using those abilities.

Nurses in a caring environment are accountable for their actions and the care they give to their clients. It is a continuing challenge for nursing leaders to address concerns that bear on authority and responsibility of nurses given their role in the health care setting. The competency of nurses is in question especially when acts of negligence and not being able to act according to the scope of nursing practice leading to patient injury or acts that may cause harm are observed within the field of practice (Jacoby & Scruth, 2017). It is, therefore, necessary for the nurses who are in the administrative position in hospitals, with the span of control, to continuously monitor the performance of nurses and review institutional performance assessments and compare with competency standards. Nurse Managers need to assess constantly the competencies of clinical nurses to ensure that services of qualified workforce and safe patient care are delivered. Monitoring performances may always require competency tools. Several studies have confirmed that the use of scales for competence self-assessment encourages practice improvement and continuing education (Buchan, 1997; Tosin, Bonaldi, Biban, et al., 2017).

Nursing practice in the Philippines is guided by the National Core competency standards, which can be used as a guide to formulate assessment tools to monitor nurses' competency. However, hospitals do not have the necessary validated tools developed which are tailor-fitted to the Filipino nurse in actual practice, to check whether essential competencies are transferred, to link and bridge the gap from academe to the clinical practice.

A study by Tosin et.al. (2017) cited that several studies have been conducted in Finland and Spain on competency assessments, these studies agreed on a common conclusion that “the formulated instruments are not based on explicit and validated measurement scales weighted for the specificity of the clinical setting” (Meretoja et al., 2004; Batalden et al., 2002; Finotto et al., 2009). Therefore, the need for validation of competency assessment tools is an appropriate measure to tailor-fit according to what is needed to be assessed in a specific health care setting.

In this light, this study hopes to validate the overall factor structure of the nursing core competencies and its indicators through scale item analysis. The results of this study hope to contribute to the dearth of studies on scale development of nursing competencies fitted to the culture and work environment of the Filipino nurse. Given the scale, this can be used to determine the strength and weaknesses of the current practice which can be the basis for curriculum improvement and formulation of standardized assessment tools for health care institutions geared towards the improvement of quality nursing care.

Framework

The assumptions of this study are anchored on the following theories: Patricia Benner’s “The Primacy Caring Model” (from novice to expert nursing model); the National Nursing Core Competency Standards of 2012 as stipulated under CMO 15 series of 2017.

The theme of this study concentrated on the nursing competencies, considering that the primacy of the nurses’ role is the capacity to effectively and efficiently perform her duties and responsibilities, which greatly impact patient care outcomes and quality care delivery in health care organizations. Competency models serve as standards in formulating tools for assessment. A study on the Development of a Nursing Competency Framework using thematic qualitative content analysis showed that providing a competency-based model, and expanding and standardization of competency concepts in different dimensions of the nursing profession is a necessity (Ahmadi, Yazdani, & Mohammad-Pour, 2017).

Patricia Benner’s (1984) Model of Professional Nurse Development as cited by Lawson in 2017, described the progression of nurses through stages as they gain experience in nursing practice. Benner’s (2004) work is heavily founded on the Dreyfus model of skill acquisition. She specified the model as situational “rather than being a trait or talent model because the focus is on actual performance and outcomes in particular situations”. It is also identified as developmental because alterations in a performance in selected situations can be compared over time; though, there is no recognition of the talents or traits that are possessed by a person that causes a skillful performance.

There are five stages outlined in Benner's (1984; 2004) model: novice, advanced beginner, competent, proficient, and expert. The following statements provide a brief description of each stage:

Stage 1, novice, the beginner is about to begin her journey in her professional career.

This is the entry-level where the nurse is guided by rules and regulations. Her practice heavily relies on idealism in complying with defined roles and job descriptions. The level of experience in this stage is during the first year of the nurse's clinical practice.

Stage 2, advanced beginner, the nurse in this stage now demonstrates a performance level that requires minimal to moderate supervision. The nurse has gained an acceptable amount of experience that allows her to make sound decision-making in situations that call for her prompt attention. There is still a reliance on rules, and support is necessary for priority setting and assistance in meeting the patients' needs for care. Benner indicates that the new graduate typically functions close to the level of a beginning staff nurse. As the beginning nurse gains ample amount of experience, her competence in terms of skill, knowledge, and development of desirable behavior and attitudes follows.

Stage 3, Competent, the nurse in this stage has established working environment familiarity; one can manage patient care activities and work roles and can formulate goals that are vital for quality patient outcomes. The nurse can identify measures and develop critical thinking abilities in ensuring that when sentinel events happen solutions are at hand and attempts to prevent problems from happening. Certainty is not ensured, and thus, one does not act expediently or flexibly (Dillon, 2002). The nurse has developed a moral compass in her practice, distinguishing good from bad practice, and has a sense of self-awareness; knowing what areas in her role needs improvement and what needs to be honed for mastery. Benner (1982; 1984) comments that a nurse at this level has generally 2-3 years of experience in the same position. However, in a later publication (2004), Benner indicates that competence may occur after 1-2 years in practice, but emphasizes that the speed at which one acquires competence has to do with experiential learning and the patient population in terms of its variety and complexity. Exposure to the same complexity and number of clients served widens the horizon of the nurse to become proficient in her practice.

Stage 4, Proficient, the nurse relies on perceptions that are based on experiences and events. The nurse knows what is "typical" for a given situation and knows how to plan and make modifications when necessary. The nurse can see the entire situation instead of viewing different aspects and attributes. Performance, though, is still guided by maxims. Decision-making is improved, less-labored, and problems are more easily and accurately identified through an understanding of "early warning signals" (Benner, 2004). A nurse deemed proficient generally has been working with a similar patient population for 3-5 years.

Stage 5, *Expert*, the nurse exhibits a wealth of experience from which one can have an “intuitive grasp of each situation and zeroes in on the accurate region of the problem without wasteful consideration of a large range of unfruitful, alternative diagnoses and solutions” (Benner, 2004) The nurse in this stage have developed a “clinical eye” where prioritizations of tasks come easy, the wisdom the nurse gained from years of experience gave her the ability to be a critical sentient being that perception and astute recognition of the clinical scenarios is noted without much difficulty; thus, less dependence on procedures and methods is noted but not deviating from ethical standards. Benner notes that expert “practice is a way of knowing through experiential learning and embodied know-how” ((Benner, 2004).

The stages specified by Benner that years of experience is a requirement for each stage, but the progression of the nurses’ competency solely depends on the capability, confidence, motivation, and other factors that will affect the professional growth of the nurse in clinical practice. Benner’s theory is relevant to this proposed study because it served as a roadmap for nurses as they go through each stage and transition from an inexperienced nurse to an expert nurse. Each stage is translated by Benner that provides a vivid description of what nurses are like for each stage while performing their duties and responsibilities. Such responsibilities are then translated into the provision of nursing care following the ethical-moral standards of the profession. The day-to-day encounters of the nurse with clients, families, colleagues, and members of the health team provided the opportunity of honing their knowledge, skills, and attitudes, allowing personal and professional growth, giving the nurse the confidence to carry out and carry on with their roles, this competency is cultivated up until the nurse becomes an expert in the field of nursing practice. Moreover, Benner’s framework is aligned with the objective of the study in assessing the level of competence of nurses as they transition from the entry-level of employment up until they gain significant experience making them experts in the field. Therefore, nurses must see themselves grow in their chosen field of career and the provision of safe and quality nursing care through continuous audits and appraisals through performance assessments.

The 2012 National Nursing Core Competency Standards (NCCS) is a collaborative effort of experts in the field of nursing namely: Philippine Board of Nursing (PRBON) with Commission on Higher Education (CHED) Technical Committee in Nursing education, Association of Deans of Philippine Colleges of Nursing (ADPCN), Philippine Nurses Association (PNA), Association of Nursing Service Administrators of the Philippines (ANSAP), University of the Philippines - College of Nursing (UP-CON) as World Health Organization (WHO) collaborating center for nursing development. Such collaborative effort is aimed towards aligning the nursing profession with global demands and international standards and will serve as a guide and blueprint for hospitals and schools in formulating any related evaluation tools in various practice settings in the Philippines. The standard describes Core competencies defined into three (3) major roles that are deemed to be possessed by every nurse practitioner as they begin to venture into their chosen field

of work s healthcare providers. The roles are the following: *Beginning Nurses Role in Client Care*, *Beginning Nurses Role in Leadership and Management* and *Beginning Nurses Role in Research*.

Roles, according to the NCCS (2012) set the expected patterns of professional behavior for professional nurses in society performed within clearly established and universally accepted processes - the nursing process. The Core Competencies are then explicitly provided with responsibilities composed of performance indicators where Skills, Knowledge, and attitudes that a Filipino nurse ought to possess are reflected (NCCS, 2012). The following are the expected beginning nurses' roles:

- *Beginning Nurse's Role in Client Care*. In this role are five (5) responsibilities, namely: Responsibility 1: Practices per legal principles and the code of ethics in making a personal and professional judgment; Responsibility 2: Utilizes the nursing Process in the interdisciplinary care of clients that empowers the clients and promotes safe quality care; Responsibility 3: Maintains complete and up to date recording and reporting system; Responsibility 4: Establishes a collaborative relationship with colleagues and other members of the team to enhance nursing and other health care services, and Responsibility 5: Promotes professional and personal growth and development.
- *Beginning Nurse's Role in Management and Leadership*. This role stipulates six (6) responsibilities, which include: Responsibility 1: Demonstrates management and leadership skills to provide safe and quality care; Responsibility 2: Demonstrates accountability for safe nursing practice; Responsibility 3: Demonstrates management and leadership skills to deliver health programs and services effectively to specific client groups in the community setting; Responsibility 4: Manages a community/village-based health facility/component of the health program or nursing service; Responsibility 5: Demonstrates ability to lead and supervise nursing support staff; Responsibility 6: Utilizes appropriate mechanisms for networking, linkage, building, and referrals.
- *Beginning Nurse's Role on Research*. Research is another activity expected of a beginning nurse and there are three (3) defined responsibilities Responsibility 1: Engages in nursing or health-related research with or under the supervision of an experienced researcher; Responsibility 2: Evaluates research study/report utilizing guidelines in the conduct of a written research critique; Responsibility 3: Applies the research process in improving client care in partnership with a quality improvement/quality assurance/nursing audit team.

Another source of expected nurse competencies is the CMO 14 series of 2009, which was superseded by the NCCS of 2012. It elaborated the identified eleven (11) key areas of responsibilities as follows: Safe and Quality Care, Management of Environment and Resources,

Health Education, Legal Responsibility, Ethico-moral Responsibility, Personal and Professional Development, Quality Improvement, Research, Record Management, Communication, as well as Collaboration and Teamwork (ADPCN, 2006).

The NCCS of 2012 therefore, serves as a unifying structure for nursing education and practice, a guide for the basic nursing education program, development of a framework for the competency-based nursing licensure exam, and any related evaluation tools in various practice settings in the Philippines (International Labour Organization, 2014).

This study observed the process flow as reflected in Figure 1 to complete this dissertation. The *Context* which is the *Nursing Core Competencies* is a multi-dimensional construct comprised of three dimensions described as roles: Beginning Nurses Role on Client Care; Beginning Nurses Role in Leadership and Management; Beginning Nurses Role on Research. The core competencies are significant in determining the constructs for the competency Indicators which is the *Input* of the process. The derived item scale is labeled as *Competency Indicators*, which is the result that will undergo testing, or the *Process* which is the *Factor Analysis*. The succeeding outcomes of the statistical method will now be the Validated Indicators of the Constructs.

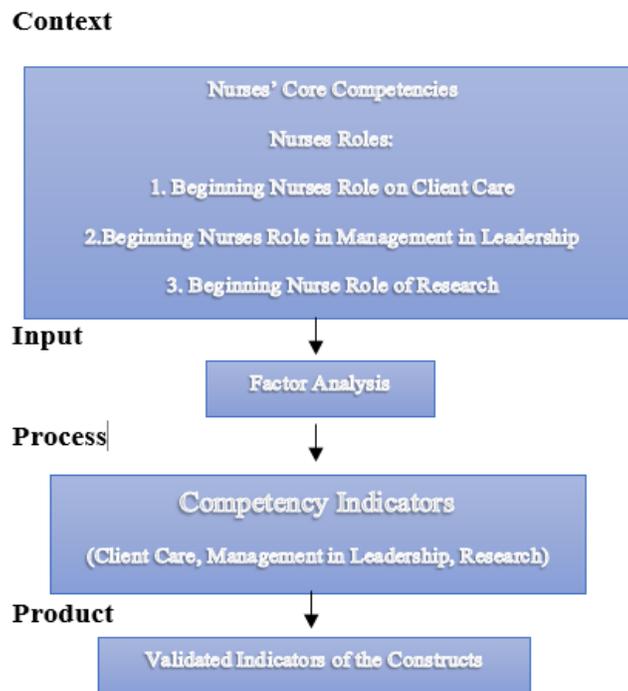


Figure 1. Process Flow of the Study

Objectives

The study hopes to validate the overall factor structure of the nursing core competencies and their indicators through scale item analysis

The specific aims of the study were to:

1. Construct a validated instrument for the Nurses' Core Competencies
2. Provide results and findings to contribute as a guide to enhance curricula and ensure continuity of regulations for safe nursing practice.
3. Adequately describe for the nursing service, areas that need improvement, where formulation or development of nursing operation manuals may be done to allow for a conducive working environment meanwhile empowering and enabling nurses to provide efficient and effective care that espouses professional growth where nurses may optimally hone their knowledge, skills, and attitudes.

These addresses the following research questions in a group of professional nurses in hospitals and healthcare institutions:

1. What are the major competencies of nurses' in the beginning role in:
 - 1.1. Client care;
 - 1.2. Management & Leadership;
 - 1.3. Research?
2. What are the relevant key indicators for nurses' competency tools?
3. What are the main constructs of the competency tool?

Methodology

The study used the mixed method. A mixed methods research design is a procedure for collecting, analyzing, and "mixing" both quantitative and qualitative data in a single study to understand a research problem (Creswell, 2007). Specifically, it used the exploratory design where qualitative data was gathered first before the study. The sequence to data collection involved collecting qualitative data followed by quantitative data. The quantitative data was used to develop or explain the initial qualitative findings. After which, the quantitative data became the basis for scale development.

Respondent and Sampling Procedure

Stage 1. The first batch is chief nurses from various hospitals in Cagayan De Oro and Bukidnon who are the chosen respondents for the qualitative approach of the study. An open-ended questionnaire was floated to the 14 chief nurses from private and government hospitals. These experts are purposively selected considering that they have the supervisory and top-level

management skills as chief nurses and supervisors, making them fit to assess the necessary competencies and evaluate nurses' performance in clinical practice.

Upon retrieval of the open-ended questionnaire, the items were consolidated and grouped into themes. Items that fit as "performance indicators" for a beginning nurse in practice were retained, while items that are supervisory and managerial were not included. As soon as the analysis of the items was completed, the survey tool was distributed to another set of experts, chief nurses from 8 hospitals, 5 experts from nursing schools, and 1 from Commission on Higher Education, Region 10. This set of experts scrutinized the items in terms of essentiality, appropriateness, and whether the items are within the standards of nursing practice. There are items deleted and recommendations from the experts were followed and included in the tool. After the critiquing, items were finalized and underwent another round of scrutiny from a mentor who has been a clinician, academician, and researcher, to ensure the validity of the items included in the survey tool.

Stage 2. The population selected in the study were the staff nurses employed in private and government hospitals in Cagayan De Oro City and Bukidnon. Purposive sampling was employed in the selection of the respondents for each hospital. In theory and practice, to analyze the factors, a large number of samples were needed to specify the size of the sampling group. Wongwanich and Wiratchai (2003) suggested the way to specify the number of samples for factor analysis. A proportion defines 5 samples per 1 variable. If the study will have 100 variables; therefore, several samples were at least 500 nurses. In the study, out of the 700 questionnaires floated to the respondents, 524 copies were retrieved.

Research Instrumentation

The study underwent two phases in terms of obtaining data for analysis.

Phase 1. Employed qualitative data collection. Researcher-made open-ended questions which are based on the 11 key areas of responsibilities as stipulated in CMO 15 series of 2012 were answered by the 14 chief nurses from private and government hospitals located in Cagayan de Oro and Bukidnon. The answers derived from the answered open-ended questions and interviews underwent coding and thematic analysis. The researcher performed critical selection and listing of items to be set as performance indicators. The set items went through critiquing and review in terms of appropriateness and importance by another set of 14 experts in the field of nursing practice. The experts chosen have valuable experience in administration and policy making in nursing practice both hospital practice and academe.

Initial content validity was performed by another expert who is also a researcher, academician, and clinician for more than 15 years and possessed the qualities of an expert in the field of nursing practice. For the final content validation of the tool, a commonly used content validity

measurement developed by Lawshe (1975) was also employed. It involved a panel of 14 subject matter experts, rating the items into one of three categories: “essential,” “useful, but not essential,” or “not necessary.” Items deemed “essential” by a critical number of panel members are then included within the final instrument, with items failing to achieve this critical level discarded (Ayre and Scally, 2014). Results of the study suggested that items with a CVI of 0.60 or higher for three or more experts can be considered evidence of good content validity. The results of the final content analysis were the basis in selecting the indicators or scale items reflected in the tool that was floated and subjected to factor analysis.

Phase 2. The tool reflected the major themes and the listed nurses’ performance indicators or scale items. The items were assigned seven rating scales as to Level of Importance. The following scoring procedure is employed: 1 – not at all important; 2 – low importance; 3 – slightly important; 4 – neutral; 5 – moderately important; 6 – very important; 7 – extremely important.

Data Gathering Procedures

Upon approval to proceed with the study, a letter of permission was sent to the chief of hospitals requesting consent that the questionnaires will be distributed purposively to the expert respondent for the qualitative phase and to the nurses for the quantitative phase. Informed consent was obtained from the participants and the following were considered according to the standards of the American Psychologist Association (APA).

The data gathering consisted of two (2) phases:

Phase 1. The first phase of the study was qualitative which led to the second phase. An open-ended questionnaire was given to the experts, where the questions were drawn and structured from the 11 key areas of responsibilities, namely: Safe and Quality Care, Management of Environment and Resources, Health Education, Legal Responsibility, Ethico-moral Responsibility, Personal and Professional Development, Quality Improvement, Research, Record Management, Communication, and Collaboration and Teamwork (ADPCN, 2006).

The questionnaire was floated to the fourteen (14) nursing experts assigned to major hospitals (private and government) located in Cagayan De Oro and Bukidnon. Qualitative data were elicited from Chief Nurses, with Masters’ and Doctoral degrees and have been in the nursing practice for 15 – 20 years. All the responses of the participants were encoded verbatim. The diverse answers were content analyzed and coded individually, before determining the final thematic categories for the responses to each of the research questions. Listings of the items (performance indicators) were derived from the statements that were content analyzed and coded. To ensure that the content

of the tool followed the practice standards-setting in the Philippines, the listed items were closely compared to standards,

Using the guidelines of Heppner and Heppner (2004) the responses were analyzed into core ideas and were categorized as general, typical and variant. In “general” responses, almost all the participants indicated the response. “Typical” responses were stated at least by a fourth to half of the respondents. While responses indicated as “variant” were mentioned by only one or two participants. After categorizing and formulating the thematic analysis, the items that were supervisory or managerial, such as hiring and selection of staff or formulating the hospital’s 5-year development plan and the like were not included in the final items. The selected items were then structured into statement items, classified as “performance indicators” as reflected in the survey tool.

Content validity was initially done through the Delphi approach where the items were scrutinized and agreed upon by the experts. The first round of content analysis and verification of categories and core ideas or performance indicators underwent scrutiny from a set of fourteen (14) experts (Chief Nurses, Supervisors, Deans, and CHEDRO 10 Education Specialist) who consented when requested by the researcher through a letter of request. These experts are well versed with the dimensions of the competencies in nursing practice making them fit to perform content validation of the items. Using the guidelines of the Nursing Core Competency Standards of 2012, the responses were analyzed by the experts in terms of appropriateness of the listed item for each major theme.

Redundant items were deleted and some items were transferred to another major theme where it was appropriate, such as items that were listed in Safety and Quality, were transferred to Quality Improvement. The core ideas depended on the outcomes of the thematic analysis. Since the themes were already pre-identified using the constructs of Nursing Core Competencies, the core ideas were fitted into each of the major themes: safe and quality nursing care, management of resources and environment, health education, legal responsibility, ethical-moral responsibility, personal and professional development, quality improvement, research, record management, communication, and collaboration and teamwork.

Phase 2. The second stage of this study was quantitative which was the onset of scale development for each major theme termed as Performance Indicator queues. The listed item indicators were based on the first stage responses. To further confirm the appropriateness of the performance indicator queues another round of content validation was reemployed by consulting another expert who has been a nurse clinician, academician, researcher, nursing service director, and president of one of the major hospitals in Bukidnon. After establishing the content validity scientifically, discussed earlier in the instrumentation, the survey tool was ready for data gathering for further validation using the reduction method in exploratory factor analysis.

Finally, the survey tool was floated to 700 staff nurses of four major hospitals in Cagayan de Oro and Bukidnon. Out of the 700 questionnaires, 524 were retrieved and subjected to statistical analysis, specifically the Exploratory Factor Analysis.

Statistical Treatment

Statistical treatments are utilized in the conduct of the study are the following:

Factor Analysis. Exploratory Factor analysis (EFA) was utilized recognizing it as a significant process in the development, refinement, and evaluation of tests, scales, and measures (Williams, Brown, et al. 2010). It is the most appropriate statistical to use since the objective of the study attempted to establish whether the items in the predetermined themes were unidimensional through the reduction method. EFA is frequently used to develop questionnaires: to measure ability or trait and to ensure that the questions asked to relate to the constructs that the study intended to measure. Factor analysis can cluster data generated by many statements into five or more groups. Objectives of Exploratory Factor Analysis (Pett Lackey et al. 2003; Thompson 2004) are reduction of several factors (variables); assessment of multi-collinearity among factors which are correlated; unidimensionality of constructs evaluation and detection; evaluation of construct validity in a survey; examination of factors (variables) relationship or structure; development of theoretical constructs; and prove proposed theories.

Varied measures are involved in EFA, namely, reliability indices, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's Test of Sphericity, Eigenvalues, and rotation.

- Reliability Indices. Cronbach's alpha is the most common measure of internal consistency (reliability). It is commonly used when you have multiple Likert questions in a survey/questionnaire that form a scale and the researcher wishes to determine if the scale is reliable. George and Mallery (2003), as cited by Gliem, J. and Gliem R. (2003), provide the following rules of thumb: "above 0.9 – 0.81 Good, 0.80 – 0.71 – Acceptable, 0.70 – 0.61 – Questionable, 0.60 – 0.50 – Poor, and below 0.50 – Unacceptable". While increasing the value of alpha is partially dependent upon the number of items on the scale, it should be noted that this has diminishing returns. It should also be noted that an alpha of 0.8 is probably a reasonable goal.
- Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. Kaiser, (as cited by Field, 2005) recommends accepting greater values than 0.5 as acceptable (values below should lead the researcher to either collect more data or rethink which variables to include). Furthermore, values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great values, and values above 0.9 are superb.
- Bartlett's Test of Sphericity. This is used to test the null hypothesis that the original correlations matrix is an identity matrix. For the factor analysis to work, we need some relationships between variables and if the R-matrix were an identity matrix then all

correlations coefficients would be zero. A significant test tells us the R-Matrix is not an identity matrix. The test is significant and if the value is less than 0.5 and highly significant if it is less than 0.001. The factor analysis is appropriate if the test is significant (Field, 2005).

- Eigenvalues. As cited by Field (2005), Kaisers’ recommendation of eigenvalues must be over 1 to retain the number of factors to continue with the analysis.
- Rotation. The interpretability of factors can be improved through rotation. It maximizes the loading of each variable on one of the extracted factors while minimizing the loading on all other factors. Rotation works by changing the absolute values of the variables while keeping the differential values constant.
- Varimax, quartimax, and equamax are orthogonal rotations. The exact choice of rotation depends on whether or not you think that the underlying factors should be related. If you expect the factors to be independent then you should choose the orthogonal rotation. Field (2005), recommends varimax for orthogonal rotation. Comrey rated orthogonal factor loadings as follows: 0.75-Excellent; 0.63-Very Good; 0.55-Good; 0.45-Fair; and 0.32-Poor. A factor loading of 0.5 is a very suitable item for evaluating a factor.

Table 1. Exploratory Mixed Method Design

EXPLORATORY MIXED METHOD DESIGN (CRESWELL, 2011)	
First Phase	Second Phase
Qualitative Data from fourteen (14) experts	Development of scales for each subsystem with 524 nurses in Private and Government Hospitals in Region 10
Listing of Competencies (142 scale items)	Cronbach’s Alpha for Reliability
Content Validity from another set of fifteen (15) experts	Kaiser-Meyer-Olkin (KMO) for sampling adequacy
Lawshe’s Content Validity Ratio	Barlett’s Test of Sphericity
	Exploratory Factor Analysis (Principal Axis Factor with varimax Rotation of Likert scale questionnaire)

Results and Discussion

Using the guidelines of Heppner and Heppner (2004) the responses were analyzed into core ideas and were categorized as general, typical and variant. In “general” responses, almost all the participants indicated the response. “Typical” responses were stated at least by a fourth to half of the respondents. While responses indicated as “variant” were mentioned by only one or two participants.

The results of the Exploratory Factor Analysis yielded the subcategorization of the 12 major themes to their corresponding major competency as seen in Table 2 below:



Table 2. Categorization of Major Themes and Competencies

Nurses' Beginning Role in:		
<i>Client Care</i>	<i>Management in Leadership</i>	<i>Research</i>
Communication	Safe & Quality Nursing Care	Research
Collaboration & Teamwork	Management of Resources	Continuing Education
Quality Improvement	Health Education	
Ethico-Moral Responsibility	Personal Professional Development	
Records Management	Legal Responsibility	

The responses based on Hepper and Heppner's (2004) guidelines elicited no "variant" responses, "typical" responses to be: Quality Improvement, Ethico-moral Responsibility, Records Management, Safe & Quality Care, Health Education, Personal & Professional Development, Legal Responsibility, and Research. "General" responses were, namely: Communication, Collaboration & Teamwork, and Management of Resources. The relevant key indicators were determined using the whole set of answered 142 item-indicators with the EFA and confirmed by parallel analysis (PA) using the Monte Carlo principal component analysis (PCA). The process resulted in three (3) factor loading components corresponding to the three (3) major competencies sought in this study.

Table 3 shows the Cronbach's alpha of .994 which means that the instrument is reliable since it is greater than the standard value of 0.700. Likewise, Table 4 shows the Principal Component Analysis with Varimax (Rotation) given the Kaiser Normalization of the 142 Likert scale questions from the Nurses' Competency Assessment Tool. Further examination of the Kaiser-Meyer Olkin measure of sampling adequacy suggested that the sample was Factorable (KMO =.965), which further implies that there is a sufficient sample for the process.

To confirm the number of factor loadings, the parallel analysis using Monte Carlo PCA for PA was utilized. Three (3) factors with eigenvalues higher than 1 were found that explained the following percentages of the total variance: 77.926% (first factor), 6.627% (second factor), and more than 6% (third factor). This means that a total of more than 63.909% of the variance was explained by this set of factors, which suggests that the specificity of each item, and the multidimensional character of the construct, even when there is a common part shared by all items. The percentages of variance also revealed the importance of the three factors as the necessary characteristic of the nurses' role in client care, management in leadership, and research.

Table 3. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.994	.994	142

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.965
Bartlett's Test of Sphericity	Approx. Chi-Square	113931.176
	df	10011
	Sig.	.000

Table 5 shows the factor loadings for rotated 142 survey items. Sixty-nine (69) items were loaded into *factor one* called Client Care. There were 57 items loaded to *factor 2* which loaded for Management in leadership would mean the subsumed competencies within the functions of management, and 16 items loaded to *factor 3* which are descriptions of the nurses' significant role in engaging in research and continuing education.

Table 5. Factor Loadings of 142 Scale Items

Major Construct	Items	Factor Loadings
Client Care	69 items	0.449-0.809
Management in Leadership	57 items	0.440-0.7302
Research	16 items	0.464-0.806

Exploratory Factor Analysis of the 3 Major Constructs

Client Care which came out as Factor 1 from the 142 item indicators in the overall parallel analysis, was further subjected to the EFA and five (5) factors came out from this reduction processes which also corresponded to the five aspects of client care: *communication, ethical-moral responsibility, quality improvement, collaboration, and teamwork and records management*. These five (5) factors have eigenvalues higher than 1, explained the following percentages of the total variance: 64.770 % (first factor), 3.245% (second factor), 2.517 % (third Factor), 2.259 (fourth factor), and 2.094 (fifth factor); that is, a total of more than 74.884 of the variances was explained by this set of factors, which suggests that the specificity of each item, and the multidimensional character of the construct, even when there were common parts shared by all items. It should be recalled that Field (2005) cited Kaisers' recommendation of eigenvalues must be over 1 to retain the number of factors to continue with the analysis.

Table 7 shows the Cronbach's alpha of .992 which means that the instrument is reliable since it is greater than the standard value of 0.700. Table 8 likewise shows the PCA through Varimax (Rotation) with Kaiser Normalization of the 69 Likert scale questions from the Nurses'

Competency Assessment Tool. Further examination of the Kaiser-Meyer Olkin and Barlett’s test measure of sampling adequacy suggested that the sample was Factorable (KMO =.974). To confirm the number of factor loadings, the parallel analysis used the Monte Carlo PCA for PA was utilized. The percentages of variance also revealed the importance of the five factors as the necessary characteristic of the nurses’ role in client care. The items identified perceptible features of nurses in their ability to establish a harmonious relationship, provide effective and efficient care to clients and maintain good working relationships with colleagues.

Table 6 presents the factor loadings for a rotated component of *client care* competency that factored five (5) components correspondingly.

Table 6. Factor Loading for Five (5) Components for Client Care

Major Themes	No. of Items	Factor Loadings
Communication	17 items	0.556 – 0.684
Ethico-moral Responsibility	18 items	0.414 – 0.802
Quality Improvement	15 items	0.454 – 0.737
Collaboration and Teamwork	12 items	0.437 – 0.699
Records Management	7 items	0.512 – 0.683

Table 7. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.992	.992	69

Table 8. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.974
Bartlett's Test of Sphericity	Approx. Chi-Square	51520.777
	df	2346
	Sig.	.000

The Factor 2 of the overall EFA, generated four (4) components, corresponding to the four (4) dimensions of Management in Leadership which are as follows: *safe and quality care, management of resources, personal & professional development with legal responsibility, and health education*, as seen in Table 9. *Factor Loading for Four (4) Components for Management In Leadership*

Table 9. Factor Loading for Four (4) Components for Management in Leadership

Major Theme	Items	Factor Loadings
Safety and Quality Care	18 items	0.487 – 0.746
Management of Resources	16 items	0.5637 – 0.737
Personal and Professional Development	14 items	0.448 – 0.736
Health Education	9 items	0.456 – 0.664

Table 9 further shows the factor loadings for rotated for 57 survey items. Eighteen (18) items loaded into factor one called safety and quality care. Under this factor are items identified as perceptible features of nurses in their ability to provide effective, efficient and safe, and quality care to clients. 16 items loaded to factor 2 labeled as management of resources, which provided descriptions of the nurses' significant role in ensuring that the use of resources is cost-efficient and cost-effective. On the other hand, 13 items loaded to factor 3 which described the nurses' personal and professional development as well as legal responsibility, while 10 items loaded in factor 4 labeled as health education.

Table 10 shows the internal consistency of the items, given Cronbach's alpha = .986, implying the reliability of the instrument. Also, Table 11 displays the PCA through Varimax (Rotation) with Kaiser Normalization of the 57 Likert scale questions from the Nurses' Competency Assessment Tool. The Kaiser-Meyer Olkin measure of sampling adequacy suggested that the sample was factorable (KMO =.967). The parallel analysis using Monte Carlo PCA for PA was utilized, to confirm the number of factor loadings. Four (4) factors with eigenvalues higher than 1 were found that explained the following percentages of the total variance: 56.654 % (first factor), 5.022% (second factor), 3.573 % (third Factor), and 2.404 % (fourth factor); that is, a total of more than 67.653% of the variance is explained by this set of factors. This data implies the specificity of each item, and the multidimensional character of the construct, even when there were common parts shared by all items. The percentages of variance also revealed the importance of the four (4) factors/ and or components as the necessary characteristic of the nurses' role in management in leadership.

Table 10. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.986	.986	57

Table 11. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.966
Bartlett's Test of Sphericity	Approx. Chi-Square	34378.153
	df	1596
	Sig.	.000

The third identified competency is Research and Table 12 shows that the items in this competency are reliable as shown by the Cronbach's alpha of .963, while Table 13 shows the PCA with Varimax (Rotation) with Kaiser Normalization of the 16 Likert scale questions from the Nurses' Competency Assessment Tool with KMO =.94, the measure of sampling adequacy suggested that the sample was factorable. To confirm the number of factor loadings, the PCA was utilized. Two (2) factors with eigenvalues higher than 1 were found that explained the following percentages of the total variance: 65.267 % (first factor), and 9.595 % (second factor; that is, a total of more than 74.863 of the variance was explained by this set of factors, which suggests that the specificity of each item, and the multidimensional character of the construct, even when there is a common part shared by all items. The percentages of variance also revealed the importance of the two factors as the necessary characteristic of the nurses' role in research. Table 14 shows the factor loadings for the rotated 16 survey items. Twelve items loaded into *factor 1* or component categorized as Research. The items validated the importance and involvement of nurses in research and these items include the following:

Table 12. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.963	.963	16

Table 13. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.

		.941
Bartlett's Test of Sphericity	Approx. Chi-Square	9404.283
	df	120
	Sig.	.000

Table 14. Factor Loading for Two (2) Components for Research

Major Theme	Items	Factor Loadings
Research	12 items	0.604 – 0.876
Continuing Education	4 items	0.757 – 0.840

Tables 15, 16, and 17 hence present the main constructs of the competency tool.

Table 15. Main constructs for Client Care – Construct 1

Construct 1	Major Theme	Competency Indicators
Client care	Communication	17 items
	Ethico-moral Responsibility	18 scale items
	Quality Improvement	15 scale items
	Collaboration and Teamwork	12 scale items
	Records Management	7 scale items

Table 16. Main Constructs for Management & Leadership – Construct 2

Construct 2	Major Themes	Competency Indicators
Management & Leadership	Safety and Quality Care	18 scale items
	Management of Resources	16 scale items
	Personal and Professional development	14 scale items
	Health Education	9 scale items

Table 17. Main Constructs for Research – Construct 3

Construct 3	Major Themes	Competency Indicators
Research	Research	12 scale items
	Continuing Education	4 scale items

The commonalities of the items for each component significantly agreed with the indicators described in the NCCS of 2012, for this reason, the researcher retained the ten (10) pre-determined

major themes labeled to each component to wit: Communication, Collaboration and Teamwork, Records Management, Quality Improvement, Ethico-moral Responsibility, Safe and Quality Care, Personal and Professional Development, Legal Responsibilities, Management of Resources and Research, while items under the major theme Research is labeled Research and Continuing Education.

Conclusions

The primary aim of the study was to develop a scale responsive to the current nursing practice that is aligned with the set standards. Having found evidence for its validity and reliability, the strength of this tool lies in the fact that these statements were generated by those who are in actual practice.

The core ideas generated and competency indicators provided the information that nurses in these major hospitals in Cagayan de Oro and Bukidnon are familiar with the competency standards set by the authorities. The study also confirmed that the use of the NCCS of 2012 can also become the basis for formulating assessment tools. The item indicators for each dimension of every major construct are adequate and present a major initial step towards formulating the final tool, based on the appropriate scientific processes observed in the whole study.

Finally, several studies on competency assessment are found in the literature, but there is no single tool that would ultimately ensure the overall performance of nurses. This study, therefore, concludes that competency assessment is dependent on the environment, culture, and practices of a particular health institution in the context of a standard set by an authorized body.

Recommendations

Based on the findings and conclusion presented in the study, the following recommendations are offered:

- *For the BON; CHED: PRC:* It is highly recommended that the findings of this study may further be subjected to a more thorough view. That the item indicators of each dimension and their corresponding competency construct may be finally considered for formulating an assessment tool. The result of formulated assessment tool may be used for regular monitoring among nursing schools and also encourage schools to use the assessment tools especially those used in the assessment of the performance of students in the clinical be subjected to validation measures.
- *Future Researchers:* That researchers will take interest in competency assessment studies to further confirm the constructs and indicators from the tool formulated in this study and may be used to measure competencies about other variables such as those dimensions of the nurses' holistic work roles (task or technical competencies, contingency management competencies, task management competencies and

environment role competencies) as described by the World Health Organization (WHO).

- *For the Nursing Administrators:* It is further suggested for nursing administrators to update assessment tools with current practice, comparing with the standards and if the institution affords it, conduct research studied concerning Nurses' Performance, covering the measurement of the nurses' holistic work roles.
- *Academic Institutions:* The results of the study may provide nursing schools an insight towards the development to use in assessing student performance.
- *Bukidnon State University:* The results of the study may be utilized by the nursing school in assessing its graduates in their performance as beginning nurses in the field of nursing practice.

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