# Terminal Assessment of Core Nursing Knowledge in a State University

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**Abstract** – *Assessment of educational outcomes upon completion of the nursing program is one way to inform academic institutions of the effectiveness of their teaching-learning practices. A descriptive correlational study design was carried out among 141 graduating nursing students of West Visayas State University to assess their terminal cognitive competency on core nursing knowledge framed under the National Nursing Competency Standards' 11 Key Areas of Responsibility. All regular graduating students in the year 2015 with complete records of secondary data needed for the study were included. A validated and reliability tested questionnaire was used to assess the terminal core nursing knowledge competencies of the students. Results revealed that students, prior to graduation, had good core nursing knowledge. Significant differences were found in the terminal core nursing knowledge of students when grouped according to Nursing Aptitude Test (NAT) and academic performance in professional nursing courses, with students who had excellent and superior NAT performance and those with very good and outstanding academic performance in professional nursing courses having significantly higher terminal core nursing knowledge. NAT and academic performance had significant, positive correlation to core nursing knowledge. Further, NAT and academic performance accounted for 46% of variance explained in the core nursing knowledge of nursing students. Higher Education Institutions, therefore, must commit themselves in providing quality nursing education by ensuring proper, responsive and relevant implementation of the nursing curriculum. This in turn may translate to attainment of intended educational outcomes and learners knowledgeable of the basic foundation of nursing practice.*

**Keywords** – *terminal assessment, outcomes assessment, terminal competency, key areas of responsibility, nursing education*

## INTRODUCTION

Outcomes-based education (OBE) has been the recent trend in the field of education including nursing. Scholars, experts and authorities have expressed concern over the lack of knowledge, skills and readiness for work among graduating nursing students [1]. The concerns about graduates from traditional nursing programs resulted to shift in focus to the OBE paradigm [2].

The Philippine Commission on Higher Education (CHED) defines OBE "as an approach that focuses and organizes the educational system around what is essential for all learners to know, value, and be able to do to achieve a desired level of competence" [3]. "Outcome", which is sometimes used interchangeably with competency, standards, benchmarks and attainment targets, is regarded as the core concept in OBE [2]. Outcomes according to Spady, 1994 are "clear, observable demonstrations of student learning that occur at or after the end of a significant set of learning experiences that reflects what the student knows, what the student can actually do with what he or she knows, and the student's confidence and motivation in carrying out the demonstration" [2]. While OBE primarily suggests competency, performance, or skills, it does not neglect the fact that the OBE paradigm acknowledges the role of cognition; thus, also reflects the knowledge or theoretical component in learning. Some definition of competency echoes overlap of knowledge with range of skills, judgement, decision making, problem-solving and affective components [4, 5].

Assessment drives OBE hence plays a very important role in the paradigm [3]. It is generally accepted that assessment of competence should use more than one indicator [6]. In addition, defining and measuring competency among nursing students is notoriously difficult [7, 8]. There is also variation in the definitions of competency, its domains, and its levels by profession and in different countries [1]. Furthermore, assessment of outcomes comes in various modes depending on purpose, delivery, and time of

administration. Terminal assessment is a type of assessment that is usually given to measure learning that has occurred during the course, term, semester or program [9, 10]. Alison Evans Consulting on behalf of National Cancer Nursing Education Project EdCaN summarized literature published from 2000-2007 on competency assessment in nursing. The author found that most of the studies identified general issues of competence assessment having few articles describing approaches to ensure validity and reliability of assessment tools, with most studies having small sample sizes using, cross-sectional descriptive designs and reporting predominantly qualitative findings [6]. Regardless of these limitations, the author concluded that the studies still provide some useful insights into approaches for competence assessment.

The West Visayas State University (WVSU), as a premiere institution, annually administers the Terminal Competencies Assessment (TCA) through the University Learning Assessment Center (ULAC). This is given before graduation to determine the readiness of graduating college students for a highly competitive technologically-advanced job market [11]. It aims to determine the performance of graduating college students in the different behavioral competencies and specialized knowledge tests. Since 2012, the Bachelor of Science in Nursing (BSN) group has consistently performed better in all the general behavioral competencies in the university-wide assessment where out of 25 specializations, it has topped the Critical Thinking, Research Competence and Information Literacy tests for the past four years. In 2015, however, the TCA included assessment of specialized knowledge or core nursing knowledge. The test assessed the terminal core nursing knowledge of students anchored on the 2005 version of the Philippine National Nursing Core Competency Standards' (NNCCS) 11 Key Areas of Responsibility by Professional Regulation Board of Nursing (PRBON). The NNCCS was adapted and promulgated in 2005, enhanced in 2009 and further refined and validated in 2012. It serves as a unifying structure for nursing education and practice, a guide for the basic nursing education program, development of framework for competency-based nursing licensure exam, and any related evaluation tools in various practice settings in the Philippines [12]. As basis for the development of the nursing curriculum, the CHED by the issuance of memorandum order number 14 incorporated the core competency standards in the 2009 Policies and Standards for the BSN Program. The

mandate intends to prepare a nurse, upon completion of the BSN program, to demonstrate beginning professional competencies following the 11 Key Areas of Responsibility [13]. The Key Areas of Responsibility for which a nurse should demonstrate competence in are the following: (1) safe and quality nursing care; (2) communication; (3) collaboration and teamwork; (4) health education; (5) ethico-moral; (6) legal; (7) personal and professional development; (8) management of resources and environment; (9) records management; (10) research; and (11) quality improvement.

Despite the existence of the Philippine NNCCS for a decade after its adoption and implementation, authors recognize the paucity of research endeavours utilizing and adopting it as framework for assessment and research.

Outcome-assessment data support celebrations of achievement, directions for improvement and guidance for new initiatives [14]. As the educational process can be described as a system where faculty and students constitute inputs into the system, the teaching-learning process illustrates the throughput and test, papers and clinical evaluation are the outputs [15], this study determined whether the aptitude (input) and academic performance (throughput) of students were related to their terminal knowledge (output) after completion of the four-year BSN program in the Philippines.

**OBJECTIVES OF THE STUDY**

This study aimed to determine the terminal core nursing knowledge of nursing graduates in the year 2015 in a State University in the Philippines. Specifically, the study aimed to determine: 1) the terminal level of competency of nursing students in the nursing core knowledge; 2) if there is a significant difference in the core nursing knowledge of students grouped according to their NAT performance and in their academic performance in professional nursing courses; 3) if there is a significant relationship between nursing students' a) NAT performance, b) academic performance in professional nursing courses and their terminal core nursing knowledge; and 4) how many percent of variance in the terminal core nursing knowledge of nursing students can be explained by NAT and academic performance in professional nursing courses.

**MATERIALS AND METHODS**

This study utilized a descriptive correlational design that included the existing data sets of 141 nursing graduates of WVSU in 2015. Only regular students with complete records of the secondary data needed for the study were included. The NAT scores were obtained from the Center for Educational Measurement, Inc. The grades in professional nursing courses were taken from the Transcript of Records of the students after permission was granted by the Vice President for Academic Affairs and consent from students was secured. The 2015 TCA results were acquired from the WVSU ULAC, tasked to administer the test. The TCA test of core nursing knowledge is a specialized knowledge test that was developed by the researchers who are experts in the field of nursing education and are master trainers of the NNCCS. The test was composed of 200 items anchored in the 11 Key Areas of Responsibility. The items in the test were constructed to measure cognitive competency of a beginning safe nurse practitioner. The percentage of the number of items in the test was patterned after the Competency-Based Test Framework of the PR-BON and as follows: safe and quality care (50%), communication (5%), collaboration and teamwork (5%), health education (5%), ethico-moral responsibilities (5%), legal standards (5%), personal and professional development (5%); management of resources (5%), environment and records management (5%), research (5%) and quality improvement (5%). The test has a Cronbach alpha coefficient of .829.

Statistical tools for analysis included frequency counts, percentage, mean, ANOVA, Scheffe post hoc test, Pearson's $r$ correlation, and multiple linear regression. The level of significance was set at .05 alpha. Kolmogorov-Smirnov test was used to test for normality or non-normality of data set. The obtained significance value was greater than .05 which means that the data were normally distributed, hence the use of parametric statistical tools.

**RESULTS AND DISCUSSION**
**Performance in Terminal Assessment of Core Nursing Knowledge**

Table 1 reveals that overall, nursing students had good ( $\bar{x}$ = 65.46) performance in the terminal assessment of core nursing knowledge. As per competency, they had excellent performance in ethico-moral competency ( $\bar{x}$ = 78.01) and had good performance in the other 10 competencies, namely:

research ( $\bar{x}$ = 73.90), management of resources and environment ( $\bar{x}$ = 69.29), records management ( $\bar{x}$ = 68.37), quality improvement ( $\bar{x}$ = 67.45), communication ( $\bar{x}$ = 65.87), collaboration and teamwork ( $\bar{x}$ = 64.45), safe and quality care ( $\bar{x}$ = 64.35), legal ( $\bar{x}$ = 63.97), personal and professional development ( $\bar{x}$ = 56.31) and health education ( $\bar{x}$ = 54.04).

In line with the OBE definition, the result shows demonstration of student learning at the end of significant learning experiences. This reflects what nursing students know at the completion of the degree. The WVSU CON has been consistent over the years in its performance in the Philippine Nurse Licensure Examination (NLE), proof of its commitment to quality instruction and in nurturing a tradition of excellence in nursing education. Upon the adoption of the 11 Key Areas of Responsibility in 2009, the College has been steadfast in the integration of these nursing competency indicators in the BSN curriculum. For years, the College also admits a maximum of 200 freshman students. A local study has shown that there is a decreasing trend in the achievement of competencies as enrollment increases [16]. With the small number of enrollment, the College is able to meet the recommended faculty to student ratio and provide adequate facility for learning and areas for Related Learning Experience or RLE.

It is embodied in the mission of the College to produce not only scientifically informed nurses, but also nurses who are able to make sound legal and ethical judgment. It is significant to note the students included in the study are highly knowledgeable of the nurses' ethical and moral responsibility. Results of this investigation find support in the study that found ethics and standards as one of the highest ranked subscales in leadership, management and team competencies of student manager-leaders as rated by student manager-leaders, student subordinates and clinical instructors respectively [17]. Further, the same study revealed overall positive results in terms of the leadership, management and team competencies of student manager-leaders. In other countries, higher knowledge and skills scores for moral deliberation and decision making was noted among nursing students in later years in nursing education [18]. Similarly, in the area of patient safety, increasing knowledge and competence was noted as nursing students' progress in the program [19]. The result demonstrates that nursing education provides good foundation to impart knowledge among

students in their undergraduate nursing program. It must however be at the forefront of nursing education the constant call in the provision of quality nursing care and the development of broad, comprehensive attention to patient safety in the nursing curriculum [20]. Although performance as revealed in this study was generally good, it should be noted there are still knowledge gaps in the core competency of students. A study conducted using an internet-based competency appraisal test among senior nursing students revealed below expected level of competency in areas that impact patient safety, knowledge management and clinical reasoning [16].

It is also noteworthy that graduating nursing students had good knowledge about research. In an earlier investigation, nursing students were proficient in basic research skills posting the highest group mean when compared to students of other colleges in the University [21]. This can be explained by the good research practice of the College where students are given sufficient lecture hours on research and are required to pass a thesis defense prior to graduation. On top of this, students are also provided with opportunities to present their research works and join research competitions both locally and internationally.

Table 1. Overall and per core competency performance of core nursing knowledge

| Core Nursing Knowledge Competencies | $\bar{x}$ | Rank | Interpretation |
|---|---|---|---|
| Ethico-Moral | 78.01 | 1 | Excellent |
| Research | 73.90 | 2 | Good |
| Management of Resources and Environment | 69.29 | 3 | Good |
| Records Management | 68.37 | 4 | Good |
| Quality Improvement | 67.45 | 5 | Good |
| Communication | 65.87 | 6 | Good |
| Collaboration and Teamwork | 64.45 | 7 | Good |
| Safe and Quality Care | 64.35 | 8 | Good |
| Legal | 63.97 | 9 | Good |
| Personal and Professional Development | 56.31 | 10 | Good |
| Health Education | 54.04 | 11 | Good |
| Overall | 65.46 | | Good |

<25% = Low; 25 – 49% = Fair; 50 – 74% = Good; 75% – 100% = Excellent

It is also surprising to uncover that although having good performance, nursing students in the study ranked

lowest in the area of health education. In the same vein, previous research revealed a weak level of health education competency among beginning staff nurses [22]. Knowledge gaps about health literacy among nursing students were also identified from several prior studies [23-25]. Provision of health education is a primary responsibility of nurses. Attention in addressing grey areas in health education knowledge early in nursing education is imperative.

Table 2 shows that almost all (89.4%) of the nursing students had good performance as revealed in the terminal assessment of core nursing knowledge and only a few (7.8% and 2.8% respectively) had excellent and fair competencies.

Table 2. Distribution according to performance in terminal competency assessment

| Performance Description | f | % |
|---|---|---|
| Excellent (75% – 100%) | 11 | 7.8 |
| Good (50% – 74%) | 126 | 89.4 |
| Fair (25 – 49%) | 4 | 2.8 |
| Total | 141 | 100 |

The findings show that in general nursing students of WVSU, upon completion of the program, are ready to practice as beginning safe practitioner based on their cognitive level. They probably know the rationale behind their nursing actions; hence they can distinguish between correct and incorrect actions. Further, the findings suggest that the graduates can be considered prepared to take the licensure exam for nurses and are ready for a highly competitive job market.

Table 3. ANOVA result for the difference in core nursing knowledge grouped according to NAT

| NAT | $\bar{x}$ | Core Nursing Knowledge | N | SD |
|---|---|---|---|---|
| Excellent | 68.37 | Good | 38 | 6.12889 |
| Superior | 66.69 | Good | 34 | 5.84784 |
| Above Average | 64.77 | Good | 44 | 7.16131 |
| High Average | 60.56 | Good | 25 | 8.07429 |
| Total | 65.46 | Good | 141 | 7.21221 |
| $df = 3$ | $F = 7.219$ | | | Sig. = .000 |

526 – 575 = High average; 576 – 625 = Above average; 626 – 675 = Superior; 675 – 800 = Excellent

Table 3 shows that when grouped according to NAT performance, students had good core nursing knowledge in all NAT categories. ANOVA result however revealed that while in all NAT categories, students had good core nursing knowledge, statistically, there was a significant difference in the mean score of

core nursing knowledge of nursing students when classified according to their performance in the NAT (F = 7.219; sig. = .000). A closer analysis of data in the post hoc analysis revealed that nursing students with excellent and superior NAT performance had significantly higher performance in the terminal assessment of core nursing knowledge.

Aptitude test like NAT serves to predict subsequent performance and is also seen as a good measure of potentials. The tests are employed to estimate the extent to which an individual will profit from a specific course or training, or predict the quality of achievement in a new situation [26-28].

The WVSU College of Nursing maintains a highly competitive selection and admission process where the NAT forms part of the application procedure. However, its utility among WVSU student population has not been well documented. The data of the current study imply that nursing students with superior and excellent NAT results are more likely to perform better in the terminal assessment of core nursing knowledge. Thereby, the result of the present study supports the current practice of including NAT in the admission and selection policy of the College.

Table 4. ANOVA result for difference in core nursing knowledge grouped according to academic performance

| Academic Performance | $\bar{x}$ | Core Nursing Knowledge | $N$ | SD |
|---|---|---|---|---|
| Outstanding | 75.67 | Excellent | 9 | 2.62202 |
| Very good | 69.83 | Good | 35 | 5.04092 |
| Good | 64.76 | Good | 58 | 5.98622 |
| Very satisfactory | 60.19 | Good | 39 | 6.50062 |
| Total | 65.46 | Good | 141 | 7.21221 |

| $df = 3$ | $F = 27.145$ | Sig. = .000 |
|---|---|---|

1.50 – 1.74 (92 – 94) = Outstanding; 1.75 – 1. 99 (89 - 91) = Very Good; 2.01 – 2.24 (86 – 88) = Good; 2.25 – 2.49 (83 – 85 = Very Satisfactory)

It can be gleaned in Table 4 that when classified according to academic performance in professional nursing courses, students with outstanding academic performance had excellent performance in the terminal assessment of core nursing knowledge. Those with very good, good and very satisfactory performance all had good performance in core nursing knowledge terminal assessment. ANOVA results revealed that there was a significant difference in the mean score of the core nursing knowledge of nursing students when classified according to their academic performance in professional nursing courses. Further analysis of the post hoc data

revealed that nursing students with good, very good and outstanding academic performance in nursing subjects had significantly higher performance in terminal assessment of core nursing knowledge compared to those with very satisfactory academic performance. Additionally, students with very good and outstanding academic performance had significantly better core nursing knowledge than those with good academic performance only. In other words, nursing students who perform academically at very good and outstanding level are more likely to have higher level of core nursing knowledge.

Like any achievement test that generally represent a terminal evaluation of an individual's status upon the completion of training [28], the results of this study denote that nursing students who perform better in their academics are also more likely to have better performance in an end program assessment of nursing knowledge.

Table 5. Relationship between NAT, academic performance and terminal core nursing knowledge

| Variables | *r* value | Sig. | Interpretation |
|---|---|---|---|
| NAT | .402 | .000 | Significant |
| Academic Performance | .667 | .000 | Significant |

As reflected in Table 5, there was a significant positive moderate relationship between nursing students' performance in the NAT and their performance in the terminal assessment of core nursing knowledge (*r* = .402; p = .000). This means that as students' aptitude for nursing increases, their terminal knowledge competencies in the cognitive domain also increases.

Furthermore, Table 5 shows that there was a significant positive strong relationship between academic performance in professional nursing courses and performance in terminal assessment of core nursing knowledge (*r* = .667; p = .000). This indicates that as performance in nursing subject increases, it can be expected that performance in terminal assessment will also increase.

**Regression Model of Core Nursing Knowledge**

As shown in Table 6, when taken individually, both NAT (p = .049) and academic performance (p = .000) came out significant predictors of terminal core nursing knowledge with academic performance (Beta = .607) being a better predictor than NAT.

Table 6. Linear regression analysis model summary of core nursing knowledge

| Model | Unstandardized Coefficients | | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| 1     (Constant) | -28.317 | 8.698 | | -3.255 | .001 |
|        NAT | .021 | .010 | .138 | 1.985* | .049 |
|        Academic performance | 20.764 | 2.379 | .607 | 8.729* | .000 |

| R Square = .460 | Std. Error of the Estimate = 10.677427 | F =58.750 | Sig. = .000 |
|---|---|---|---|

When all the independent variables were entered in the regression model, the NAT and academic performance together yielded a significant influence in the terminal assessment of core nursing knowledge (F = 58.75; p = .000). Further, the performance in the NAT and academic performance in professional nursing courses explain 46% of variance in terminal assessment of core nursing knowledge. The remaining 54% can be explained by other factors not included in this study. As an end result of this investigation, the prediction equation model of terminal assessment of core nursing significantly contribute to the performance of students in terminal assessment of core nursing knowledge. While aptitude for the course has a significant bearing towards terminal course assessment, a greater part can be attributed to the four-year teaching-learning process of the students focusing on studying the important core concepts in nursing. The findings corroborates to the results of researches that found academic performance or college grade point/weighted average as a significant predictor of board examination success [30-32], which is likewise a method for assessment of terminal nursing knowledge for entry level nursing practice. Likewise, NAT as predictor of academic success in nursing school established by earlier studies [33-35], support the results of the present study.

**CONCLUSION AND RECOMMENDATION**

Whether the outcomes of this study prove valid for nursing students as a whole is yet to be ascertained, the results of the present investigation suggest that at the end of the nursing program at WVSU College of Nursing, students are equipped with the necessary knowledge expected of beginning nurse practitioner although there are still gaps in their core nursing knowledge. Nursing education has imparted good foundation of knowledge to students hence graduates seem ready for local licensure exam for nurses and are set to take on a competitive job market. In addition, anchoring the nursing curriculum in the 11 Key Areas of Responsibility embodied in the NNCCS truly serves its purpose as a unifying framework for designing sound

knowledge is core nursing knowledge = .02 NAT + 20.76 academic performance – 28.32.

Change is seen as transformation of system in time [29]. This study assessed if change can result by transforming students through the four-year teaching-learning process in nursing school towards the desired outcome of having the needed entry level cognitive competency of a beginning nurse practitioner. The results of the study demonstrate that performance in the NAT and academic performance

and relevant nursing degree programs in the country. Research has shown that a nursing core competency standard education is helpful for the training of nursing students' core competencies [36].

Moreover, aptitude for nursing proves to predict performance of students in nursing school. The higher the students' aptitude for nursing, the more likely they perform better in nursing school. In addition, students who academically do well in nursing courses are expected to do well in the outcomes assessment of what they have learned in the nursing school. It can be deduced that input and process can significantly influence outcomes. Also, there are multiple factors that can impact outcomes of students within the nursing program. While aptitude for nursing can predict the likelihood of student success, nursing school plays an immense role in moulding students to become professional nurses. NAT alone cannot be viewed in isolation to solely predict students' outcomes in nursing school. Aptitude, quality nursing education, and proper implementation of the curriculum ensures that educational graduate outcomes are met.

It is recommended that NAT should still be included as part of the admission policy of the college to incoming nursing students of the new OBE BSN curriculum. Higher Educational Institutions offering the nursing program must warrant a curriculum responsive to cater to the educational needs of the students.

It can be expected that not all students admitted in the program will have superior aptitude and excellent performance in class. Remedial and academic support

must therefore be provided to students lagging behind or those not coping well with their studies. The college together with a strong administrative support must continue to provide quality nursing education and strive hard to achieve not only good performance but excellent outcomes.

Whereas this study is limited only to terminal competency assessment within the cognitive domain, having a single school and batch, other factors not identified in this study that can influence outcomes of the educational process among nursing students must be further explored and investigated.

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17

P-ISSN 2350-7756 | E-ISSN 2350-8442 | www.apjmr.com
Asia Pacific Journal of Multidisciplinary Research, Vol. 6, No. 2, May 2018 Part II