Impact of Hybrid Teaching on Prelicensure Baccalaureate Nursing Students

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Introduction

The demand for professional baccalaureate-educated nurses (BSN) is increasing ("Employment of New Nurse Graduates," 2016). What prelicensure nursing program characteristics are associated with students passing the National Council Licensure Examination (NCLEX) ("NCSBN NCLEX & Other Exams," 2017)? Is there some combination of student characteristics or clinical and didactic outcomes that will predict which students will successfully pass the NCLEX? Do teaching methods or students' use of technology influence NCLEX scores? A previous Sentara College of Health Science's project identified that student characteristics are important in understanding why BSN students succeed (Banks, C et al., 2013). Further research emphasizes the need for RNs within our own health system has increased from 40% to 80% in the past 4 years (Downs & Taylor, 2016).

The initial aims of this study were threefold: (1) to test whether there were associations between student characteristics and NCLEX pass/fail rates; (2) to test whether there was an association between academic performance in didactic and clinical courses; and (3) to test whether scores in both didactic and clinical courses were significant predictors of NCLEX success. The nursing program adopted hybrid teaching and classroom technology after data collection began. High fidelity clinical simulations were also developed at this time. These changes also may have affected our findings.

Methods

This was a retrospective study of data collected within the nursing program at Sentara College of Health Sciences between Fall 2012 and Spring 2015. Data was examined for the 253 nursing students who were enrolled and graduated during this time period. Student characteristics (race, age, gender, marital status, military experience, VA eligibility, and scholarship), as well as clinical and didactic course performance were examined. Student data was protected as required by the Family Educational Rights and Privacy Act.

Results

Aim 1: Chi-square tests were performed to test differences in NCLEX. There were no statistically significant differences in NCLEX pass/fail rates based on student characteristics (race, age, gender, marital status, military experience, VA eligible, and scholarship).

Aim 2: A bivariate correlation showed a statistically significant positive association between average didactic and clinical scores. Specifically, higher scores in didactic classes were associated with higher scores in clinical classes, $r = .545$, $p < .001$, $R2 = .297$.

Aim 3: Binary logistic regression was used to test hypotheses that scores in both didactic and clinical courses were significant predictors of NCLEX success. When included separately in the model, the average didactic variable was a significant predictor of NCLEX pass/fail (OR = 1.21, 95% CI [1.03 1.43],

with 6% NCLEX variance explained); while the average clinical variable was not a significant predictor of NCLEX pass/fail (OR = 1.10, 95% CI [.88 1.38], with less than 1% NCLEX variance explained).

Post-hoc exploratory analyses of each course individually: Higher final numeric grade in the course, NUR 410 Adult Nursing II was statistically significantly associated with greater likelihood of passing the NCLEX, OR = 1.36, 95% CI [1.09 1.70]. Finally, although the course, NUR 315 Fundamentals of Nursing Practice final numeric grades were not statistically significantly associated with NCLEX pass/fail rate, performance in NUR 315 correlated to 9.4% of NCLEX success, which may be relevant.

Conclusion

What accounted for the differences in NUR 410 Adult Nursing II from other nursing courses and why did it correlate to NCLEX success? To answer this question, a comparison was made of our first-attempt NCLEX pass rates to state and national rates for the time period of 2012 to 2015. In 2012, our first-time pass rate was 96.3% (Virginia Board of Nursing, 2017) compared with 90.4 % for the state of Virginia and 90.34% nationally (National Council of State Boards of Nursing, 2015). In 2013, there were many changes to the NCLEX examination and our rate dropped to 83% (Virginia Board of Nursing, 2017), compared to 83.1% for state and 83.04% nationally (National Council of State Boards of Nursing, 2015).

As a result, many changes were made in our classrooms. The School of Nursing adopted hybrid teaching. Hybrid teaching mixes a variety of teaching techniques, learning styles and delivery methods (Linder, K, 2017). In our nursing program, didactic content is delivered online via lecture capture. The didactic content is reviewed and applied during face-to-face classroom time. Depending on the course, up to 49% of the didactic material can be delivered online. Additionally, classroom technology (lecture capture videos, Assessment Technology Institute modules, One-Link learning modules, games, polling, blogs, discussion boards, webcams and smartphones for recording student videos, computer-based concept mapping, Quizlet, WebQuest and voice-over PowerPoint) was also adopted. High fidelity simulations were developed and added to clinical courses. These actions seem to have delivered results because in 2014, our pass rate was 93.33% (Virginia Board of Nursing, 2017), compared to 82.9% for the state and 81.78% for the nation (National Council of State Boards of Nursing, 2015). In 2015, our pass rate was 96.9% (Virginia Board of Nursing, 2017) compared to 87% for the state of Virginia and 84.53% nationally (National Council of State Boards of Nursing, 2016). These results confirmed our pass rates were improving.

When examining the results of our courses, Nursing Fundamentals and Adult Nursing II correlated with student success on NCLEX. Nursing Fundamentals reinforces lecture capture concepts with classroom activities, ATI modules and Sentara Healthcare online One-Link modules. Students learn the nursing process in this course and practice application of this process. Adult Nursing II reinforces lecture capture videos with multiple case studies requiring critical thinking and application during the face-to-face classroom time. This is supported by NCLEX-style questions and use of ATI modules which reinforces the learning. In conclusion, while grades in Adult Nursing II appear to correlate to passing NCLEX, the changes in teaching methods and increased use of technology may have also influenced these positive results.

Title:

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Abstract Summary:

Associations between student characteristics, and academic performance as significant predictors of National Council Licensing Exam (NCLEX) success were tested. Adoption of hybrid teaching using classroom technology and high fidelity simulations impacted results.

Content Outline:

I. Introduction

   A. Demand for baccalaureate-prepared nurses increasing

   B. Initial aims of study

      1. Test for associations between student characteristics and NCLEX pass/fail rates

      2. Test for association between academic performance in didactic and clinical courses

      3. Test scores in both didactic and clinical courses for significance in predicting NCLEX success

II. Methods

   A. Retrospective study of data collected between Fall 2012 and Spring 2015

   B. Student characteristics clinical and didactic course performance examined

III. Results

   A. Chi-square tests performed, indicated no statistically significant differences in NCLEX pass/fail rates based on student characteristics

   B. Bivariate correlation showed statistically significant positive association between average didactic and clinical scores

   C. Binary logistic regression tested hypotheses that scores in didactic and clinical courses were significant predictors of NCLEX success

      1. Average didactic variable significant predictor of NCLEX pass/fail

      2. Average clinical variable not significant predictor of NCLEX pass/fail

   D. Final numeric grade for NUR 315 Nursing Fundamentals associated with greater likelihood of passing NCLEX (not statistically significant)

   E. Higher final numeric grade for NUR 410 Adult Nursing II associated with greater likelihood of passing NCLEX (statistically significant)

IV. Conclusion

   A. Comparison made of our first-attempt NCLEX pass rates to state and national rates from 2012 to 2015

B. Classroom changes were made following drop in pass rates in 2013

    1. Hybrid teaching adopted

    2. Use of technology incorporated in classroom

    3. Developed and began using high fidelity simulations in clinical

C. NUR 315 associated with greater likelihood of passing NCLEX (not statistically significant)

    1. Lecture capture videos reinforced in classroom

    2. One-Link and ATI computer modules reinforce concepts

    3. Nursing process concepts strengthened by application

    4. Practice developing care plans

D. NUR 410 statistically associated with greater likelihood of passing NCLEX

    1. Lecture capture videos reinforce with case studies

    2. Mind mapping during class discussions

    3. NCLEX-style questioning to validate understanding

    4. ATI modules to reinforce concepts

E. Changes in teaching methods likely affected results

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