Standardized Exam Scores as a Predictor for NCLEX-RN® Pass Rates in an Entry Level MSN Program

Nancy Haugen, PhD, RN & Nandini Dasgupta, MS, PhD(c)

Introduction

Background/Significance

- One measure of nursing program effectiveness used by State Boards of Nursing and national accrediting bodies is its graduates' first-time pass rate on the National Council Licensure Examination - Registered Nurse® (NCLEX-RN).[1,2]
- Nursing programs have implemented standardized exams with high stakes requirements as one method to assist in maintaining high NCLEX-RN first-time pass rates. High stakes exam policies often require students to meet predetermined cut scores to either continue in the program or to graduate.[3-4]
- Standardized exam publishers provide cut score recommendations to predict NCLEX-RN success based on nationwide data. However, these recommendations do not differentiate among types of nursing programs.
- Students in entry level MSN programs are taught the nursing curriculum in 27 months full-time study, eligible to take the NCLEX-RN examination after five semesters. Given the shorter timeframe and the impact of high stakes examinations, it is important to determine appropriate standardized exam cut scores to assure program completion and NCLEX-RN success.

Purpose

- The purpose of this retrospective study was to determine what cut score on standardized exams offered within an entry level MSN program were the best predictors first-time NCLEX-RN pass rates.

Methodology

Design

- This retrospective study used a convenience sample of entry level MSN graduates from a private health sciences university in northern California. The sample included all program graduates from 2014-2017 who took all seven offered standardized exams and the NCLEX-RN licensure exam.

Data Collection

- The exam scores were obtained from the publishers secure website and merged with NCBSN data, demographic and other key variables from the university's student information system. The independent variables were the standardized exam scores. The dependent variable was the dichotomous pass or fail results from the first attempt at NCLEX-RN licensure exam.

Data Analysis

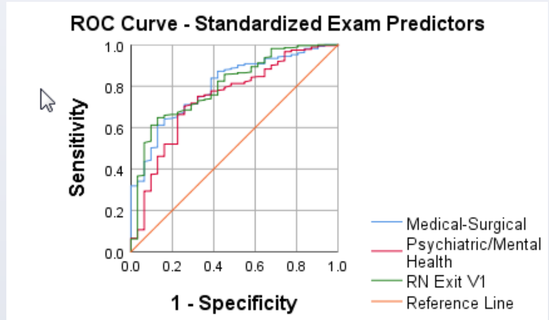
- All seven standardized exam scores (RN Exit V-1; content specific exams: Fundamentals, Medical-Surgical, Critical Care, Maternity Pediatrics, and Psychiatric/Mental Health) were analyzed using binary logistic regression.
- All six content specific exams offered in the entry level MSN program were analyzed using a binary forward logistic .
- A ROC curve analysis was conducted to determine the optimal cut score of the predictor variable for all exams and specifically for the content exams. Both sensitivity and specificity were analyzed at each cut score in the ROC coordinates.

Results

All Standardized Exams N = 304

Regression analysis indicated the RN Exit V-1, Medical-Surgical and Psychiatric/Mental Health exam scores was statistically reliable in predicting NCLEX-RN results. These three exam scores was positively associated with passing the NCLEX-RN on the first attempt. As these three exam scores increased, the students were more likely to pass on the first attempt of the NCLEX-RN. Other content specific exams were not significant predictors of NCLEX-RN results in the model using all exam scores. The overall model correctly classified 91% of the cases in the sample.

Regression Coefficients	B	Wald	*df*	*p*	Odds Ratio/ Exp (B)
Medical-Surgical	-.005	6.714	1	.010	.995
Psychiatric/ Mental Health	-.004	6.373	1	.012	.996
RN Exit V-1	-.008	11.936	1	.001	.992



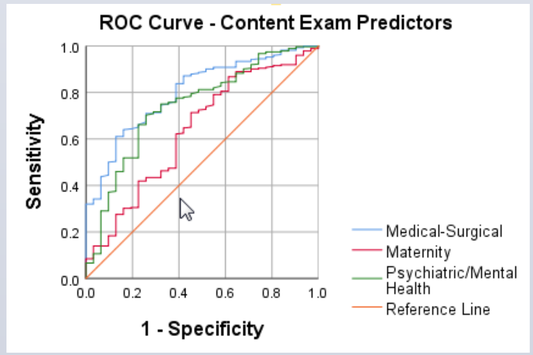
Area Under the Curve			Optimal Cut Score
	Area	*p*	
RN Exit V1 Exam	0.800	0.000	812.50
Psychiatric/Mental Health Exam	0.742	0.000	800.50
Medical-Surgical Exam	0.801	0.000	755.00

ROC curve analysis determined cut scores of the three standardized exams. All AUCs were greater than .742, *p=.000,* indicating the three exams cut scores were fairly accurate in determining the optimal cut off scores to pass the NCLEX-RN exam on the first attempt.

All Content Specific Exams N = 304

Regression analysis indicated that of the content specific exams offered in the program, Medical-Surgical, Maternity and Psychiatric/Mental Health exams when considered together were statistically reliable in predicting NCLEX-RN first-time pass rates. The overall model correctly classified 92% of the cases in the sample.

Regression Coefficients	B	Wald	df	p	Odds Ratio/ Exp (B)
Medical-Surgical	-.008	16.169	1	.000	.992
Maternity	-.005	7.932	1	.005	.995
Psychiatric/ Mental Health	-.005	8.768	1	.003	.995



Area Under the Curve			Optimal cut Score
	Area	*p*	
Medical-Surgical	0.801	.000	752.50
Maternity	0.637	.012	892.00
Psychiatric/ Mental Health	0.742	.000	799.50

ROC curve analysis determined cut scores of the three content exams. Medical-surgical and Psychiatric/Mental Health exams had AUC greater than .742, *p=.000,* indicating the these two exams were fairly accurate in determining the optimal cut off scores to pass the NCLEX-RN exam on the first attempt. Maternity exam scores had an AUC of .637, *p=.012,* indicating that this exam was not very accurate in determining the optimal cut off score for NCLEX-RN first attempt success.

Conclusions

- The RN Exit V-1, Medical-surgical and Psychiatric/Mental Health exams were strong predictors of NCLEX-RN success among all standardized exams ($p<0.05$). A ROC curve analysis suggested a fairly accurate determination of the exam cut score for all three exams. Students who scored 812.50 or greater on the RN Exit V-1 exam, 800.50 or greater in the Psychiatric/Mental Health exam and 755.00 or greater in the Medical-Surgical exam were more likely to pass the NCLEX-RN on the first attempt.
- The model for content specific exams offered in the entry level MSN program revealed that only the combined scores from the Medical-Surgical, the Maternity and the Psychiatric/Mental Health exams were predictive of NCLEX-RN success. No content specific exams independently predicted NCLEX-RN success. A score of 752.50 on the Medical-Surgical exam, a score of 892 on the Maternity exam and 799.50 on the Psychiatric/Mental Health exam were suggested cut scores from a ROC curve analysis, although the AUC values for the Maternity exam cut scores were not very accurate determinants of NCLEX-RN first-time success.
- Findings from this study were consistent with national data for the RN Exit V-1 exam in that it was strong predictor of NCLEX-RN success.[5] However, for the content specific exams, the findings differed from both a national study that analyzed data from all program types and from a single institution study. The national study found that Medical-Surgical, Pediatrics, and Critical Care content specific exam scores were most predictive of NCLEX-RN success.[5] The single institution study reported the content specific exams that best predicted NCLEX-RN success were Medical–Surgical, Pharmacology, and Community Health.[6]

Recommendations

- Identification of standardized exam cut scores are important in predicting success on the NCLEX-RN licensure exam. Using exam cut scores provides students and faculty a method of monitoring student progress throughout a nursing program and to develop individualized student remediation plans to enhance program and NCLEX-RN first attempt pass rates.
- Standardized content and exit exams may also be used as part of a comprehensive evaluation of a program's curriculum, providing an external method of evaluating student learning.
- Publishers of standardized exams recommend cut scores based on national data. As many schools use standardized exam cut scores with high states consequences for students, cut scores should be individualized to the specific institution and program type.
- Additional research is needed using both cognitive and non-cognitive variables to identify at risk students early in nursing programs.

References

1. National Council of State Boards of Nursing, (2016). Table of NCLEX pass rates. Retrieved from https://www.ncsbn.org/9436.htm
2. AACN. (2017). Fact Sheet: Accelerated Baccalaureate and Master's Degrees in Nursing. Retrieved from http://www.aacnnursing.org/Portals/42/News/Factsheets/Accelerate-Programs-Fact-Sheet.pdf
3. National Council of Measurement in Education. (2012). Standardized testing. Retrieved from http://www.ncme.org/ncme/NCME/Resource_Center/NCME/Resource_Center/Glossary1.aspx?hkey=8bd573bd-a7b4-498a-93b9-2e0081c557c0#anchorH
4. Santo, L., Frander, E., & Hawkins. S. (2013). The use of standardized exit examinations in baccalaureate nursing education. *Nurse Educator*, *38*(2), 81-84.
5. Zweighaft, E. (2013). Impact of HESI specialty exams: The ninth HESI exit exam validity study. *Journal of Professional Nursing*, *29*(25), S10-S16.
6. Yeom, J. (2013). An investigation of predictors of NCLEX-RN outcomes among nursing content standardized tests. *Nurse Education Today*, *33*(12), 1523-1528.

Contact Information

Nancy Haugen, PhD, RN; Associate Dean, Prelicensure & Undergraduate Programs
nhaugen@samuelmerritt.edu
Nandini Dasgupta, MS; Director of Institutional Research ndasgupta@samuelmerritt.edu