



Influencing Factors of NCLEX-RN Pass Rates Among Nursing Students

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Introduction

First time NCLEX-RN pass rates and successful student progression in a program are considered key indicators of quality in nursing programs and are used by state boards of nursing and accreditation agencies to assess quality. There have been many studies exploring the influencing factors of NCLEX-RN pass rate. Studies have focused on investigating relationships between demographic variables, students learning style and some nursing course grades. However, none of the studies have included all the nursing major course grades and HESI scores as influencing factors and their relationships to NCLEX-RN outcome in traditional nursing baccalaureate program. In addition, to our knowledge there are no studies that have examined students' perception of NCLEX-RN performance.

Purpose

The purpose of this study is to understand the relationship between students' factors including preadmission factors and academic factors which include all nursing major courses achievements related to NCLEX-RN outcome and to explore the students' perception for NCLEX-RN success.

Methods

Setting: mid-sized public, baccalaureate nursing program, which admits nursing students in a junior year.

Two phase study: 1) quantitative analysis of predictors of first time NCLEX pass rate and 2) written survey to query students on their perceptions of NCLEX preparation and taking the exam.

Phase 1

Analysis of administrative data of traditional undergraduate nursing students admitted between spring 2012 and fall 2015 and completed the NCLEX-RN licensure exam prior to September 2017 (N=671).

Variables: Age on the date of licensing exam, gender, campus location, admission status, degree status, admission type (native or transfer), overall GPA at time of acceptance to the program; pre-requisite course GPA, and overall test of essential academic skills (TEAS) score.

HESI testing in the following course were also included as variables: Foundations, Mental Health, Adult Health, Obstetrics, Pediatrics and Complex Adult (HESI Exit exam).

Course grades from all major nursing courses including nursing foundation, health assessment, adult health nursing, pathophysiology-pharmacology, complex health, child health nursing, family health nursing, mental health nursing and community health nursing were included in this study.

Phase 2

The data for the second phase was collected from a 12 item survey that investigators developed and sent to 355 nursing program graduates who completed the program between spring 2015 and fall 2016. Of the 355 nursing graduates were invited to participate in this study, 102 agreed to participate for response rate of 28.73%. Incomplete surveys were excluded resulting in 80 participants included in the analysis. The survey used the survey software (Survey Monkey®) and was sent to either the participants' institution affiliated email address or their personal email address. The survey included Likert-type scale, open-ended, multiple choice and yes/no type questions. The items in the survey asked the participants their perceptions about preparing and taking the NCLEX-RN. Students were asked to note how they prepared for the NCLEX-RN exam using a multiple-choice and an open-ended response. Students were also asked, why they thought they passed or did not pass the NCLEX-RN on the first try with open-ended response. In order to improve response rates, approximately two months into the data collection funding of \$750.00 was secured to buy \$10.00 Starbucks gift cards as a token of appreciation for completing the survey.

Results

Table 1. Sample Characteristics				
	N	Percentage	(N=671)	
Sex	Male	76	11.3	
	Female	595	88.7	
Age at NCLEX	20-30	550	82.0	
	31-40	121	18.0	
Ethnicity	Asian	58	8.7	
	Black/African American	104	15.5	
	Hispanic	22	3.3	
	Native Hawaiian/Other	2	0.3	
	White/Hispanic White	465	69.2	
Campus	Urban	150	22.4	
	Rural	521	77.6	
Admission year	2012	138	20.6	
	2013	119	17.7	
	2014	174	26.1	
	2015	210	31.3	
Degree Status	First Bachelor degree	185	27.6	
	Second Bachelor degree	486	72.4	
Admission Status	Accepted into program	158	23.6	
	Accepted from Wait List	513	76.4	
Admission Type	Transfer from alternate institution	398	59.3	
	Did not pass on first attempt	273	40.7	
NCLEX Result	Pass on first attempt	595	88.7	
	Did not pass on first attempt	76	11.3	
GPA	Pre-requisite GPA	3.5	62.7	
	TEAS Score	3.2	55.3	
	Overall scores	3.0	45.3	
	Foundational	3.0	45.3	
	Pathology	3.0	45.3	
	Mental/Surgical	3.0	45.3	
	Pediatrics	3.0	45.3	
	Complex Health	3.0	45.3	

The sample of 671 students were admitted to the Nursing Program between Spring 2012 and Fall 2015. As seen in Table 1, 89% of the students were female, and 11% were male. The age when they sat for NCLEX-RN was ranged from 20 to 54 years old, and 91% of the students were less than or equal to 30 years old. The majority of the sample were Non-Hispanic Whites (67%), followed by Black/African Americans (16%), and Asians (9.1%). About 10% of the sample pursued nursing degree as their second bachelor's degree. Approximately 12% of the students did not pass the NCLEX on first attempt.

Table 2. Demographic/admission Factors Predicting NCLEX results in Multivariate Logistic Regression (N=671)				
	OR	SE	z	95% CI
Sex	0.51	0.31	-1.66	0.08 - 3.84
Age at NCLEX	1.00	2.31	1.42	0.00 - 13.44
Campus	1.13	0.78	1.45	0.00 - 5.49
Admission Status	1.15	0.77	1.45	0.00 - 5.49
Admission Type	1.17	0.77	1.45	0.00 - 5.49
BAC	0.81	0.15	-2.09	0.36 - 1.88
TEAS score	1.60	0.88	1.85	0.34 - 8.19
Pre-requisite GPA	1.00	0.00	0.00	0.00 - 0.00
TEAS score	1.00	0.00	0.00	0.00 - 0.00
Overall scores	1.00	0.00	0.00	0.00 - 0.00
Foundational	1.00	0.00	0.00	0.00 - 0.00
Pathology	1.00	0.00	0.00	0.00 - 0.00
Mental/Surgical	1.00	0.00	0.00	0.00 - 0.00
Pediatrics	1.00	0.00	0.00	0.00 - 0.00
Complex Health	1.00	0.00	0.00	0.00 - 0.00

Female students were 2.5 times more likely to pass the NCLEX-RN than male students. Those who pursued second bachelor's degree in nursing are 8.8 times more likely to pass the NCLEX exam than those who pursued nursing degree as their first bachelor's. Other demographic/admission factors, including age at NCLEX, GPA, and TEAS score were not significant in the model. The model was significant (LR Chi-squared [df=9] = 23.00, $p = .006$) and accounted for 5.4% of the variance in the NCLEX results.

Table 3. Course Grades Predicting NCLEX results in Multivariate Logistic Regression (N=671)				
	OR	SE	z	95% CI
Sex	2.23	0.78	2.83	0.75 - 7.12
BAC	7.75	8.01	1.38	0.47 - 13.05
Foundational	1.13	0.45	2.43	0.25 - 5.53
Pathology	0.91	0.28	-3.24	0.36 - 2.37
Adult Health	1.03	0.45	2.28	0.17 - 1.64
Community Health	2.38	0.85	2.78	0.57 - 1.04
OB	0.84	0.22	-3.85	0.31 - 2.27
Pediatrics	1.13	0.44	2.43	0.25 - 5.53
Complex Health	2.23	0.78	2.83	0.75 - 7.12

Note. Outcome variable was coded as 0 = fail, 1 = pass; OR, Odds Ratio; Sex coded as 0 = male, 1 = female; BAC coded as 0 = First Bachelor's, 1 = Second Bachelor degree; All Grades coded as 0 = B-, C+, or C, 1 = A-, A, B+, or B; Repeated History coded as 1 = no repeated history, 0 = repeated any of the courses listed.

Grades for adult health, family health nursing, complex health (Critical care health nursing), and the repeated course history were significant predictors of NCLEX-RN pass results, controlling for gender and degree status. The odds ratio for adult health nursing is 2.36 with a 95% CI of [1.16, 4.78]. This suggests that those who received B or above for adult health nursing are 2.4 times more likely to pass the NCLEX-RN exam than those who received B- or below. Students who did not repeat any courses were 2.2 times more likely to pass the NCLEX-RN exam than those who repeated any of the courses (e.g., failure, withdrawals). The model was statistically significant (LR Chi-squared [df=12] = 92.69, $p < .001$) and accounted for 18.9% of the variance in the NCLEX-RN results.

Table 4. HESI Scores Predicting NCLEX results in Multivariate Logistic Regression (N=671)				
	OR	SE	z	95% CI
Sex	2.23	0.78	2.83	0.75 - 7.12
BAC	8.88	9.15	2.12	0.34 - 1.180
Foundational	1.11	0.30	3.38	0.51 - 2.53
Pathology	0.81	0.21	-3.82	0.415 - 1.348
Mental/Surgical	1.94	0.52	3.74	1.142 - 3.282
OB	3.13	0.50	3.96	1.778 - 5.509
Pediatrics	0.93	0.25	-2.77	0.545 - 1.585
EXIT	2.18	0.82	2.76	0.006 - 1.254

Note. Outcome variable was coded as 0 = fail, 1 = pass; OR, Odds Ratio; Sex coded as 0 = male, 1 = female; BAC coded as 0 = First Bachelor's, 1 = Second Bachelor degree; HESI scores coded as 0 = below average, 1 = equal to or above average.

The results indicate that HESI scores for adult health nursing, family health nursing, and EXIT HESI were significant predictors of NCLEX-RN result, controlling for gender and degree status. The odds ratio for adult health nursing is 1.94 with a 95% CI of [1.14, 3.29], suggesting that those who scored above or equal to the average for adult health nursing HESI are two times more likely to pass the NCLEX-RN than those who scored below the average. The model was statistically significant (LR Chi-squared [df=8] = 67.23, $p < .001$) and accounted for 13.7% of the variance in the NCLEX-RN results.

Survey

Dear Graduate,
To improve Towson's Nursing Program we would like to have your valuable feedback. We receive your NCLEX results from the Board of Nursing, but are interested in learning more about your experience taking the exam. **Participation is voluntary and any information you give is confidential.** The survey includes ten questions.

A1. Do you consent to participate in this survey?
1. Yes
2. No

A2. What semester did you graduate?
1. Spring 2015
2. Fall 2015
3. Spring 2016
4. Fall 2016

A3. How did you prepare for the NCLEX exam?
1. Review course other than Hesi
2. Self-study with review book
3. Computer program
4. Other, please specify...

A4. Did anything happen during the exam that affected your performance?
1. Noise level
2. Hunger
3. Physical discomfort
4. Other, please specify...

A5. Why do you think you passed/didn't pass the exam on the first try?
A6. Was there anything that particularly surprised you about the exam?
A7. How were your classroom experiences helpful or not helpful in preparing you for the exam?
A7-1. Anything specific in the way the courses were taught, explain...
A7-2. Anything specific in the way the courses were organized, explain...
A8. How were your clinical experiences helpful or not helpful in preparing you for the exam?
A9. Can you identify at least one thing that the nursing program could have done differently that would have helped you in the exam?
A10. Do you have any other comments about taking the NCLEX exam?
A11. Would you be willing for us to call you for more information?
1. Yes Phone Number _____
2. No _____

A12. I am acknowledging and expect to receive a \$10 Starbucks gift card. Please provide the address of where you want the gift card mailed to Address _____

Your input and response is of value to us. We hope that you take the opportunity to share your experience to help improve our nursing program.

Of the 80 students who completed the survey 67 passed NCLEX and 13 did not pass on the first try. After reviewing the results of the survey, two of the question responses stood out about NCLEX-RN exam: Questions (A5) and (A9). Common responses for why a student thought they passed NCLEX on the first try included taking a review course, aggressive use of practice questions, and studying. For students who did not pass on the first attempt the most common perception was not enough practice questions, followed by anxiety, and did not study enough. Common results from question A9 were administering NCLEX practice questions from the beginning of the nursing program starting in their junior first semester and continue that practice throughout the program, having a review course on test taking with test taking strategies, and administering more computerized exams to simulate the actual NCLEX-RN exam. The results of this survey show that more preparation specifically for the NCLEX-RN needs to start at the beginning of the nursing program and continued throughout.

Discussion

This study examines the significant predicting factors for NCLEX-RN pass in a baccalaureate program and explores the students' experience of preparation for NCLEX-RN and test taking. Study findings showed that gender and participants' degree status were significant factors among demographic variables in this study. There are only a few past studies that examined the relationship between gender and NCLEX-RN performance and the results were inconsistent. While we found students getting a second degree over 8 times more likely to pass the NCLEX exam, degree status was not consistently associated with passing the NCLEX-RN in previous studies.

Grade point averages in adult health nursing, family health nursing, complex health nursing were also significant predictors of passing the NCLEX-RN as was repeated course history. A previous study also reported that adult health nursing and family health nursing were significant predictors for standardized practice test for NCLEX-RN. It was noted that the foundation course was a significant factor for passing the NCLEX-RN among second-degree nursing students.

Adult health nursing HESI, family health nursing HESI and EXIT HESI exam scores were also found to be significant predictors for NCLEX-RN pass.

It was interesting that both GPA and HESI score of family health nursing was a significant predictor for NCLEX-RN pass even after controlling for gender. This result emphasizes the importance of delivering the contents to the students and ensuring that students understand and can apply their learning experience to the practice and test taking.

The findings from the second phase of this study present the description of what the students' perspectives are prior to and after taking the NCLEX-RN exam. Findings presented that the review course and practice test for NCLEX-RN were helpful in passing NCLEX-RN.

Results from the survey of students indicated students perceptions of why they did or did not pass the NCLEX. The most commonly reported reason for not passing was anxiety and lack of preparation. The most common type of preparation was doing multiple practice questions and taking a review course in addition to the one offered by the program. Test anxiety has been known to be a related factor for academic performance and NCLEX-RN success, which was also found in the current study.

Limitations

While this study provides valuable information regarding influencing factors for passing the NCLEX-RN, secondary data analysis is inherently limited to the available variables. Other possible significant predictors were not included in the model. In addition, study results are a reflection of students in this particular program and may be difficult to generalize to other programs.

Support

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