ORIGINAL RESEARCH

Common variables found among students who were unsuccessful on the NCLEX-RN® in a baccalaureate nursing program

Lindsay Domiano*

School of Nursing, Southeastern Louisiana University, Hammond, LA, United States

Received: November 7, 2017 **Accepted:** January 2, 2018 **Online Published:** January 26, 2018
DOI: 10.5430/jnep.v8n7p1 **URL:** https://doi.org/10.5430/jnep.v8n7p1

ABSTRACT

Schools of nursing (SON) must meet the challenges of producing safe, competent practitioners. Educators are constantly trying to identify predictors of program completion and National Council Licensure Examination–Registered Nurses (NCLEX-RN®) success, as well as variables that put students at risk for failure. The purpose of this study was to determine common variables among students from a baccalaureate-nursing program who were unsuccessful in the nursing program or on the NCLEX-RN®. This cross sectional research study utilized a retrospective correlational design to discover the relationships between independent variables of degree and cumulative GPAs, specific courses repeated, number of repeated courses and whether the student had full-time or part-time clinical faculty members and the independent variables program non-completion and NCLEX-RN® failure. The theoretical underpinning that guided this study was Bandura's Social-Cognitive Theory of Self-Efficacy. Data analyses were conducted using a series of crosstabulations with chi-square analysis and *t*-tests. The research questions were investigated using binary logistic regressions. The relationship between repeated chemistry courses and NCLEX-RN® examination success was significant. Relationships between repeated English, math, chemistry and other science courses and nursing program failure were significant. Cumulative GPAs were significantly lower for all groups analyzed. Two binary logistic regression analyses were conducted to determine variables that would predict students who failed to complete the program or failed the NCLEX-RN®. Overall both models were significant. Results may be utilized to modify admission requirements and admit students that have a higher probability of being successful in the nursing program and on the NCLEX-RN®.

Key Words: NCLEX-RN®, Success, Predictors, Nursing students

1. INTRODUCTION

Schools of nursing (SON) have always had to produce safe and competent practitioners. While meeting this goal has always been challenging, a number of factors within the current healthcare field have made the tasks increasingly difficult.[1] One factor is the growing complexity of patients' healthcare issues that requires nurses to think critically.

A factor, of particular interest affecting the goal of producing safe and competent practitioners, is the nursing shortage. One facet of the nursing shortage is the aging "baby boomer" generation. Nurse clinicians and educators from this generation are retiring, which will significantly affect patient care capabilities.[1] According to the Bureau of Labor Statistics' Employment Projections 2010-2020, by 2020, the total num-

*Correspondence: Lindsay Domiano, RN, PhD, CNE; Email: Lindsay.Domiano@selu.edu; Address: School of Nursing, Southeastern Louisiana University, SLU 10835, Hammond, LA, United States.

ber of open nursing positions will reach 1.2 million (2012). This shortage is due to growth and the need to replace retiring nurses.

Admitting more students to nursing schools is not the solution. The students admitted to these programs need to be quality students who can be successful in nursing programs and on the National Council Licensure Examination-Registered Nurses (NCLEX-RN®) that allows graduates to practice as registered nurses. Predictors have typically been about success but with the current nursing shortage, the need has arisen to identify predictors of at risk students in order to increase retention and ultimate success. Program completion and NCLEX-RN® success are important for both schools of nursing and nursing students. Schools of Nursing rely on students completing the program and passing the licensure examination in order to meet accreditation requirements and university graduation rate requirements.[2]

The purpose of this study was to determine common variables among students from a baccalaureate nursing program who were unsuccessful in the nursing program or on the NCLEX-RN®. Nursing faculty may be able to use information resulting from this study to utilize predictors that best determine students capable of completing the program and passing the NCLEX-RN® to guide admission decisions; identify at-risk students for early intervention and revise curricula and instructional strategies.

The admission requirements for the program of study were completion of pre-requisite courses with a grade of "C" or better and GPA. After successful completion of pre-requisite course, students were ranked by GPA and chosen accordingly. Students were allowed to repeat pre-requisite courses in order to increase their GPA for application to the program.[3] This study was conducted to determine if a change in admission requirements or decreasing the number of times a student is allowed to repeat a pre-requisite course and the calculation of these courses into the GPA, would affect program completion and NCLEX-RN® success or failure.

The dependent variables were program non-completion and NCLEX-RN® failure. The independent variables were cumulative grade point average (GPA), degree GPA, type of repeated courses, number of repeated courses, and exposure to part-time versus full-time clinical faculty. The cumulative GPA was based on all required pre-requisite courses the student has taken prior to application to the nursing program. This included any and all courses a student may have repeated in order to achieve a passing grade or to achieve a grade that will make the degree GPA more competitive. The degree GPA was based only on the last earned grade in each required pre-requisite course taken. Since the degree GPA included only the last earned grade for a course, it may be artificially inflated.

Select courses and the number of times these courses were repeated, were two more variables of interest. Repeated courses were divided into pre-requisite courses and nursing courses. The pre-requisite courses in this study were math, biological sciences, chemistry, and English courses. For the variable nursing courses, all nursing clinical courses were utilized as well as frequently repeated didactic courses. The nursing courses examined were Pathophysiology and Pharmacology I, Pathophysiology and Pharmacology II, Advanced Concepts in Nursing Lecture, Health Assessment of the Individual Lab, Foundations of Nursing Practice Lab, Adult and Gerontological Nursing Lab, Nursing Care of the Childbearing Family Lab, Nursing Care of Infants, Children, and Adolescents Lab and Advanced Concepts in Nursing Practice Lab. Determining relationships between the courses repeated, the number of times repeated and program non-completion or NCLEX-RN® failure is beneficial for nursing programs. Faculty can utilize this information to modify curricula or develop remediation programs to help at risk students achieve success.

The last variable examined was the appointment status of clinical faculty who taught students that were unsuccessful in the nursing program or on the NCLEX-RN®. SON administrators may be able to utilize this information when determining faculty appointments and whether or not to hire part-time versus full-time clinical faculty.

2. METHOD

The researcher used a retrospective correlational design to identify relationships between the independent variables of degree GPA, cumulative GPA, repeated courses, number of courses a student repeated, and whether or not the student had full-time or part-time clinical faculty members and the dependent variables of program non-completion and NCLEX-RN® failure. This design allowed the researcher to describe relationships between the variables and to utilize preexisting or archival data allowing the researcher to collect a sufficient sample size.[4] There was minimal to no risks for the subjects and confidentiality was easy to maintain.

This study was conducted at one state university in the southern region of the United States. The program included approximately 60 hours of pre-requisites prior to entering clinical courses.

The sample consisted of students admitted to an entry

level baccalaureate-nursing program from Fall 2006 through Spring 2011. The estimated number in the cohort was approximately 700 students. Participants consisted of male and female adult university students. The only inclusion criteria were enrollment in the school of nursing during the specified timeframe. There were no exclusions.

A priori power analyses were conducted using G*Power version 3.1.7 to determine the minimum sample size required to find significance with a desired level of power set to .80, an α-level at .05, and a moderate effect size of 1.30 (Odds Ratio) for binary logistic regression and .30 (w) for chi-square tests. Based on the analysis, it was determined that a minimum of 170 participants was required to ensure adequate power for the binary logistic regression model and 133 participants for chi-square tests. The preliminary analysis was also addressed adequately with the minimum sample size of 170 participants. Data regarding the independent and dependent variables were gathered by the school of nursing administration and entered into Statistical Product and Service Solutions (SPSS). Data were entered for each member of the cohort. Once the school of nursing administration entered data into SPSS, it was given to the researcher for analysis.

Two of the independent variables measured the grade point averages of the students. For admission to the program, cumulative GPA was calculated using the grade points received from all pre-requisite courses including repeated courses. Students often repeated pre-requisite courses multiple times in order to achieve a higher grade. Degree GPA was calculated utilizing only the last grade for any repeated prerequisite courses. Both cumulative and degree GPAs were measured on a continuous variable scale of 0 to 4. Two additional independent variables attempted to capture meaningful variation in repeated course work. Type of repeated coursework was a categorical variable with 12 categories including math, chemistry, and biological science courses; Pathophysiology and Pharmacology I; Pathophysiology and Pharmacology II; Advanced Concepts in Nursing Lecture; Health Assessment of the Individual Lab; Foundations of Nursing Practice Lab; Adult and Gerontological Nursing Lab; Nursing Care of the Childbearing Family Lab; Nursing Care of Infants, Children, and Adolescents Lab and Advanced Concepts in Nursing Practice Lab. The total number of courses a student repeated, including the same course repeated multiple times, was measured as a continuous count of repeated courses and was divided into repeated pre-requisite courses and repeated nursing courses. The final independent variable, clinical faculty, was a binary variable that measured whether the students had a full-time (0) or part-time (1) clinical instructor.

Due to uneven distributions for the repeated courses and part-time faculty variables, these two variables were recoded to allow for additional analyses. The additional variables for repeated course work for prerequisite courses were recoded into the total number of times prerequisite courses were repeated (collapsed into an ordinal variable for 0, 1 to 2, and 3 or more) and the number of different types of prerequisite courses repeated. The recoded repeated course variables for nursing courses were as follows: total repeated nursing courses (0, 1 or more); repeated early clinical courses (0, 1 or more); and repeated senior clinical courses (0, 1 or more). Early courses included Pathophysiology and Pharmacology I and II, Health Assessment of the Individual Lab, Foundations of Nursing Practice Lab, and Adult and Gerontological Nursing Lab. Senior courses included Nursing Care of Infants, Children and Adolescents Lab, Nursing Care of the Childbearing Family Lab, and Advanced Concepts in Nursing Practice Lab and Advanced Concepts in Nursing Practice. This same scheme was used for recoding part-time faculty variables, with the exception of total nursing courses with part-time faculty being coded as 0, 1, and 2 or more, rather than 0 and 1 or more.

The dependent variables were conceptualized in two ways. First, student failure was measured by non-completion of the degree program. The alternative measurement was failure on the NCLEX-RN®. Both dependent variables were operationalized as binary outcomes (0 for success; 1 for failure).

3. RESULTS

Descriptive statistics and all results are displayed in Tables 1-12. Regarding the variables degree GPA and cumulative GPA, the cumulative GPA was lower than the degree GPA for both groups of students (successful and unsuccessful on either outcome measure). Students who completed the nursing program had, on average, significantly smaller differences in GPA scores (cumulative versus degree) than students who did not complete the nursing program. Also, students who failed the NCLEX-RN® did not have significantly greater disparities between the two GPAs than those who passed the NCLEX-RN®. Cumulative GPA, however, was a significant predictor of NCLEX-RN® success (p = .003) with an odds ratio of 0.023, indicating that as students' cumulative GPAs increased they were much less likely to fail the exam®. These findings parallel the findings discussed in the literature review by Alameida, Prive, Davis, Landry and Renwanz-Boyle (2011). Significant differences were found between students in the success group and the failure group with regard to GPA.

Table 1. Frequencies and percentages for categorical variables

	n	%		*n*	%
English Courses Repeated			**Repeated Advanced Concepts in Nursing Practice**		
0	599	79.4	No	741	98.3
1	95	12.6	Yes	13	1.7
2 or More	60	8.0	Missing	0	0.0
Missing	0	0.0	**Repeated Nursing Courses**		
Math Courses Repeated			0	603	80.0
0	608	80.6	1 or More	151	20.0
1	104	13.8	Missing	0	0.0
2 or More	42	5.6	**Repeated Lecture Courses**		
Missing	0	0.0	0	630	83.6
Science Courses Repeated			1 or More	124	16.4
0	481	63.8	Missing	0	0.0
1	118	15.6	**Repeated Early Clinical Courses**		
2 or More	155	20.6	0	713	94.6
Missing	0	0.0	1 or More	41	5.4
Chemistry Courses Repeated			Missing	0	0.0
0	524	69.5	**Repeated Senior Clinical Courses**		
1	140	18.6	0	742	98.4
2 or More	90	11.9	1	12	1.6
Missing	0	0.0	Missing	0	0.0
Number of Prerequisite Courses Repeated			**Part-Time Faculty in Health Assessment of the Individual Lab**		
0	347	46.0	No	681	90.3
1 to 2	203	26.9	Yes	69	9.2
3 or More	204	27.1	Missing	4	0.5
Missing	0	0.0	**Part-Time Faculty in Foundations of Nursing Practice Lab**		
Number of Prerequisite Course Types Repeated			No	628	83.3
No Course Types	347	46.0	Yes	76	10.1
1 Course Type	173	22.9	Missing	50	6.6
2 Course Types	118	15.6	**Part-Time Faculty in Adult and Gerontological Nursing Lab**		
3 Course Types	70	9.3	No	542	71.9
4 Course Types	46	6.1	Yes	134	17.8
Missing	0	0.0	Missing	78	10.3
Repeated Pathophysiology and Pharmacology I			**Part-Time Faculty in Nursing Care of the Childbearing Family Lab**		
No	673	89.3	No	537	71.2
Yes	81	10.7	Yes	112	14.9
Missing	0	0.0	Missing	105	14.0
Repeated Pathophysiology and Pharmacology II			**Part-Time Faculty in Nursing Care of Infants, Children, and Adolescents Lab**		
No	715	94.8	No	466	61.8
Yes	39	5.2	Yes	180	23.9
Missing	0	0.0	Missing	108	14.3
Repeated Health Assessment of the Individual Lab			**Part-Time Faculty in Advanced Concepts in Nursing Practice Lab**		
No	726	96.3	No	564	74.8
Yes	28	3.7	Yes	69	9.2
Missing	0	0.0	Missing	121	16.0
Repeated Foundations of Nursing Practice Lab			**Number of Nursing Courses With Part-Time Faculty**		
No	749	99.3	0	311	41.2
Yes	5	0.7	1	275	36.5
Missing	0	0.0	2 or More	165	21.9
Repeated Adult and Gerontological Nursing Lab			Missing	3	0.4
No	745	98.8	**Number of Early Clinical Courses With Part-Time Faculty**		
Yes	9	1.2	0	507	67.2
Missing	0	0.0	1 or More	244	32.4
Repeated Nursing Care of Infants, Children, and Adolescents Lab			Missing	3	0.4
No	753	99.9	**Number of Senior Clinical Courses With Part-Time Faculty**		
Yes	1	0.1	0	364	48.3
Missing	0	0.0	1 or More	285	37.8
Repeated Nursing Care of the Childbearing Family Lab			Missing	105	13.9
No	751	99.6	**Nursing Program Completion**		
Yes	3	0.4	Completed Program	636	84.4
Missing	0	0.0	Did Not Complete Program	118	15.6
Repeated Advanced Concepts in Nursing Practice Lab			Missing	0	0.0
No	746	98.9	**NCLEX-RN®**		
Yes	8	1.1	Pass	499	66.2
Missing	0	0.0	Fail	49	6.5
			Missing	206	27.3

Note. Frequencies not summing to $N = 754$ and percentages not summing to 100 reflect missing data.

Relating degree GPAs and cumulative GPAs to Bandura's Social-Cognitive Theory of Self-Efficacy, those students that "mastered" content in prerequisite courses (shown by cumulative and degree GPAs) were more likely to achieve self-efficacy in the form of program completion and NCLEX-RN ® success. Faculty may utilize this information to modify admission requirements such as limiting the number of repeated courses or the number of times a student may repeat a course. This would decrease the differences in the GPA which would possibly lead to increased program completion. As shown in the study by Uyehara and Itano (2010), the researchers identified correlations between NCLEX-RN ® success and the nursing GPA. Since the majority of students had program and NCLEX-RN ® success, the researchers concluded that the admission criteria and academic predictors were accurate and valuable.

Table 2. Means and standard deviations for continuous variables

	N	*M*	*SD*	Min	Max
Cumulative GPA	754	3.53	0.29	2.59	4.00
Degree GPA	754	3.66	0.17	3.40	4.00
Difference Between Cumulative GPA and Degree GPA	754	0.13	0.20	-0.32	1.11

Note. N not equal to 754 reflects missing data.

Table 3. Means and standard deviations for gpa by nursing program and NCLEX-RN® failure and GPA difference by NCLEX-RN® failure

	n	*M*	*SD*	*t*	*p*
Completed Nursing Program					
Cumulative GPA	636	3.56	0.28	15.37	< .001
Degree GPA	636	3.67	0.17		
Did Not Complete Nursing Program					
Cumulative GPA	118	3.41	0.31	9.66	< .001
Degree GPA	118	3.61	0.14		
Passed NCLEX-RN®					
Cumulative GPA	499	3.57	0.27	13.58	< .001
Degree GPA	499	3.68	0.17		
Failed NCLEX-RN®					
Cumulative GPA	49	3.40	0.31	4.69	< .001
Degree GPA	49	3.58	0.10		
Difference Between Cumulative GPA and Degree GPA†					
Completed Nursing Program	636	0.12	0.19	4.04	< .001
Failed Nursing Program	118	0.21	0.24		
Difference Between Cumulative GPA and Degree GPA†					
Passed NCLEX-RN®	499	0.11	0.18	1.87	.067
Failed NCLEX-RN®	49	0.18	0.28		

Note. † Equal variances not assumed statistics reported.

Regarding the variables of repeated courses and number of repeated courses, findings support significant relationships of repeated English, math, chemistry and other science courses and the total number of prerequisite courses repeated to program failure. Findings also support, significant relationships between repeated Pathophysiology and Pharmacology I, repeated Pathophysiology and Pharmacology II and repeated Health Assessment of the Individual Lab and nursing program failure. Regarding NCLEX-RN® failure, repeat of chemistry courses was the only prerequisite that was significantly related. Significant relationships were also found between NCLEX-RN failure and repeated Pathophysiology and Pharmacology II, the total number of nursing courses repeated, and total number of repeated lecture courses. These findings partially parallel those of McGahee, Gramling and Reid[5] that significant predictive variables were passing grades in foundations and pathophysiology courses. The researchers also concluded that there were significant interactions when two or more variables were combined. Science GPA was found to be significant in four different course combinations.

Regarding the variable of part-time faculty versus full-time faculty, the relationship between the total number of clinical

nursing courses with part-time faculty and nursing program failure was significant, as was the relationship between the number of early clinical courses with part-time faculty and nursing program failure. The odds ratio of 0.246 indicates that as a student takes more nursing courses with part-time faculty, he or she is less likely to fail the program. This opens up many areas of discussion regarding part-time and full-time faculty. These results can be attributed to various reasons. One reason could be that part-time faculty members are experts in the clinical area and provide adequate instruction to students. This would support principles three and four of Bandura's Social-Cognitive Theory of Self-Efficacy. Students are successful because of the experiences shared by part-time faculty. On the other hand, part-time faculty may not be as comfortable failing students in the clinical setting, therefore a decrease in the number of students with part-time faculty that fail the program. There were no significant relationships between exposure to part-time faculty and failing the NCLEX-RN®.

Table 4. Nursing program failure by repeated prerequisite courses

	Nursing Program Completion						χ^2	*p*
	Completed Program			Failed Program				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%		
English Courses Repeated								
0	516	505.3	81.1	83	93.7	70.3		
1	72	80.1	11.3	23	14.9	19.5	7.59	.022
2 or More	48	50.6	7.5	12	9.4	10.2		
Math Courses Repeated								
0	534	512.8	84.0	74	95.2	62.7		
1	68	87.7	10.7	36	16.3	30.5	34.28	< .001
2 or More	34	35.4	5.3	8	6.6	6.8		
Science Courses Repeated								
0	425	405.7	66.8	56	75.3	47.5		
1	97	99.5	15.3	21	18.5	17.8	19.96	< .001
2 or More	114	130.7	17.9	41	24.3	34.7		
Chemistry Courses Repeated								
0	456	442.0	71.7	68	82.0	57.6		
1	110	118.1	17.3	30	21.9	25.4	9.32	.009
2 or More	70	75.9	11.0	20	14.1	16.9		
Number of Prerequisite Courses Repeated								
0	307	292.7	48.3	40	54.3	33.9		
1 to 2	175	171.2	27.5	28	31.8	23.7	17.13	< .001
3 or More	154	172.1	24.2	50	31.9	42.4		
Number of Prerequisite Course Types Repeated								
No Course Types	307	292.7	48.3	40	54.3	33.9		
1 Course Type	153	145.9	24.1	20	27.1	16.9		
2 Course Types	97	99.5	15.3	21	18.5	17.8	31.74	< .001
3 Course Types	50	59.0	7.9	20	11.0	16.9		
4 Course Types	29	38.8	4.6	17	7.2	14.4		

A binary logistic regression analysis was conducted to predict whether a student failed to complete the program (see Table 11). Overall, the model was significant, $\chi^2(5) = 134.79$, $p < .001$, Nagelkerke $R^2 = .286$. The number of Repeated Nursing Courses was a significant predictor, $p < .001$, and had an odds ratio of 4.162, indicating that students who repeat one or more nursing courses are 4.162 times more likely to fail the program. The total number of Nursing Courses With Part-Time Faculty was also a significant predictor of program failure, $p < .001$. The odds ratio of 0.246 indicates as a student takes more nursing courses with part-time faculty, he or she is .0246 times less likely to fail the program. None of the remaining predictors (e.g., Number of Prerequisite Courses Repeated, Cumulative GPA, and Difference Between Cumulative GPA and Degree GPA) were significant predictors of program failure.

Table 5. NCLEX-RN® Failure by repeated prerequisite courses

	NCLEX-RN®						χ^2	*p*
	Pass			Fail				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%		
English Courses Repeated								
0	417	411.6	83.6	35	40.4	71.4		
1	51	52.8	10.2	7	5.2	14.3	5.69	.058
2 or More	31	34.6	6.2	7	3.4	14.3		
Math Courses Repeated								
0	425	422.5	85.2	39	41.5	79.6		
1	50	49.2	10.0	4	4.8	8.2	4.83	.090
2 or More	24	27.3	4.8	6	2.7	12.2		
Science Courses Repeated								
0	342	340.6	68.5	32	33.4	65.3		
1	76	75.6	15.2	7	7.4	14.3	.56	.755
2 or More	81	82.9	16.2	10	8.1	20.4		
Chemistry Courses Repeated								
0	364	357.9	72.9	29	35.1	59.2	8.00	.018
1	82	89.2	16.4	16	8.8	32.7		
2 or More	53	51.9	10.6	4	5.1	8.2		
Number of Prerequisite Courses Repeated								
0	252	244.9	50.5	17	24.1	34.7		
1 to 2	135	139.3	27.1	18	13.7	36.7	4.50	.106
3 or More	112	114.7	22.4	14	11.3	28.6		
Number of Prerequisite Course Types Repeated								
No Course Types	252	244.9	50.5	17	24.1	34.7		
1 Course Type	117	122.0	23.4	17	12.0	34.7		
2 Course Types	77	74.7	15.4	5	7.3	10.2	9.33	.053
3 Course Types	35	37.3	7.0	6	3.7	12.2		
4 Course Types	18	20.0	3.6	4	2.0	8.2		

Table 6. Nursing program failure by repeated nursing courses

	Nursing Program Completion						χ^2	*p*
	Completed Program			Failed Program				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%		
Repeated Pathophysiology and Pharmacology I								
No	591	567.7	92.9	82	105.3	69.5	57.00	< .001
Yes	45	68.3	7.1	36	12.7	30.5		
Repeated Pathophysiology and Pharmacology II								
No	610	603.1	95.9	105	111.9	89.0	9.74	.002
Yes	26	32.9	4.1	13	6.1	11.0		
Repeated Health Assessment of the Individual Lab								
No	624	612.4	98.1	102	113.6	86.4	37.93	< .001
Yes	12	23.6	1.9	16	4.4	13.6		
Repeated Nursing Courses								
0	540	508.6	84.9	63	94.4	53.4	61.73	< .001
1 or More	96	127.4	15.1	55	23.6	46.6		
Repeated Lecture Courses								
0	558	531.4	87.7	72	98.6	61.0	51.71	< .001
1 or More	78	104.6	12.3	46	19.4	39.0		
Repeated Early Clinical Courses								
0	617	601.4	97.0	96	111.6	81.4	47.45	< .001
1 or More	19	34.6	3.0	22	6.4	18.6		

An additional binary logistic regression analysis was conducted to predict failure of the NCLEX-RN® among students who completed the program (see Table 12). Overall, the model was significant, $\chi^2(5) = 38.72$, $p < .001$, Nagelkerke $R^2 = .151$. Cumulative GPA was a significant predictor ($p = .003$) with an odds ratio of 0.023, indicating that as students' cumulative GPAs increase they 0.023 times less likely to fail the NCLEX-RN®. Also, the number of Repeated Nursing Courses was a significant predictor, $p < .001$, and had an odds ratio of 4.128, indicating students who repeat one or more nursing courses are 4.128 times more likely to fail the NCLEX-RN®. None of the remaining predictors (e.g., Difference Between GPAs, Number of Prerequisite Courses Repeated, and Number of Nursing Courses With Part-Time Faculty) were significant predictors of NCLEX-RN ® failure.

Significant findings were compiled in Table 13.

Table 7. NCLEX-RN® failure by repeated nursing courses

	NCLEX-RN®							
	Pass			Fail				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%	χ^2	*p*
Repeated Pathophysiology and Pharmacology I								
No	463	460.8	92.8	43	45.2	87.8	1.60	.207
Yes	36	38.2	7.2	6	3.8	12.2		
Repeated Pathophysiology and Pharmacology II								
No	485	479.0	97.2	41	47.0	83.7	21.17	< .001
Yes	14	20.0	2.8	8	2.0	16.3		
Repeated Nursing Courses								
0	435	420.7	87.2	27	41.3	55.1	34.69	< .001
1 or More	64	78.3	12.8	22	7.7	44.9		
Repeated Lecture Courses								
0	447	435.3	89.6	31	42.7	63.3	27.73	< .001
1 or More	52	63.7	10.4	18	6.3	36.7		

Table 8. Nursing program failure by students with part-time faculty

	Nursing Program Completion							
	Completed Program			Failed Program				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%	χ^2	*p*
Part-Time Faculty in Health Assessment of the Individual Lab								
No	582	576.6	91.7	99	104.4	86.1	3.61	.057
Yes	53	58.4	8.3	16	10.6	13.9		
Part-Time Faculty in Foundations of Nursing Practice Lab								
No	566	566.4	89.1	62	61.6	89.9	.03	.855
Yes	69	68.6	10.9	7	7.4	10.1		
Number of Nursing Courses With Part-Time Faculty								
0	225	263.4	35.4	86	47.6	74.8		
1	249	232.9	39.2	26	42.1	22.6	66.97	< .001
2 or More	162	139.7	25.5	3	25.3	2.6		
Number of Early Clinical Courses With Part-Time Faculty								
0	418	429.4	65.7	89	77.6	77.4	6.05	.014
1 or More	218	206.6	34.3	26	37.4	22.6		
Number of Senior Clinical Courses With Part-Time Faculty								
0	353	355.0	55.8	11	9.0	68.8	1.07	.301
1 or More	280	278.0	44.2	5	7.0	31.3		

Table 9. NCLEX-RN® failure by students with part time faculty

	NCLEX-RN®						χ^2	*p*
	Pass			Fail				
	Obs.	*Exp.*	%	*Obs.*	*Exp.*	%		
Part-Time Faculty in Health Assessment of the Individual Lab								
No	450	449.7	90.4	44	44.3	89.8	.02	.898
Yes	48	48.3	9.6	5	4.7	10.2		
Part-Time Faculty in Adult and Gerontological Nursing Lab								
No	390	391.5	78.3	40	38.5	81.6	.29	.589
Yes	108	106.5	21.7	9	10.5	18.4		
Part-Time Faculty in Nursing Care of the Childbearing Family Lab								
No	412	409.7	82.7	38	40.3	77.6	.82	.365
Yes	86	88.3	17.3	11	8.7	22.4		
Part-Time Faculty in Nursing Care of Infants, Children, and Adolescents Lab								
No	354	349.6	71.1	30	34.4	61.2	2.07	.150
Yes	144	148.4	28.9	19	14.6	38.8		
Part-Time Faculty in Advanced Concepts in Nursing Practice Lab								
No	441	440.6	88.6	43	43.4	87.8	.03	.867
Yes	57	57.4	11.4	6	5.6	12.2		
Number of Nursing Courses With Part-Time Faculty								
0	166	166.6	33.3	17	16.4	34.7		
1	204	201.2	40.9	17	19.8	34.7	.84	.658
2 or More	129	131.1	25.9	15	12.9	30.6		
Number of Early Clinical Courses With Part-Time Faculty								
0	327	329.6	65.5	35	32.4	71.4	.69	.405
1 or More	172	169.4	34.5	14	16.6	28.6		
Number of Senior Clinical Courses With Part-Time Faculty								
0	272	267.7	54.6	22	26.3	44.9	1.70	.193
1 or More	226	230.3	45.4	27	22.7	55.1		

Table 10. Binary logistic regression predicting nursing program failure

	β	*SE*	*Wald*	*OR*	*p*	95% CI	
Cumulative GPA	-0.582	0.83	0.50	0.559	.481	0.111	2.818
Difference Between Cumulative GPA and Degree GPA	0.150	1.06	0.02	1.162	.887	0.146	9.243
Number of Prerequisite Course Types Repeated	0.191	0.11	2.80	1.210	.094	0.968	1.513
Repeated Nursing Courses	1.426	0.24	34.63	4.162	< .001	2.589	6.692
Number of Nursing Courses With Part-Time Faculty	-1.402	0.20	48.34	0.246	< .001	0.166	0.365

Note. χ^2 (5) = 134.79, p < .001, Pseudo R^2 = .164.

Table 11. Binary logistic regression predicting NCLEX-RN® failure

	β	*SE*	*Wald*	*OR*	*p*	95% CI	
Cumulative GPA	-3.793	1.30	8.56	0.023	.003	0.002	0.286
Difference Between Cumulative GPA and Degree GPA	-2.541	1.54	2.74	0.079	.098	0.004	1.595
Number of Prerequisite Course Types Repeated	-0.162	0.19	0.76	0.850	.383	0.591	1.224
Repeated Nursing Courses	1.418	0.33	18.29	4.128	< .001	2.156	7.907
Number of Nursing Courses With Part-Time Faculty	0.054	0.20	0.07	1.056	.788	0.710	1.571

Note. χ^2 (5) = 38.72, p < .001, Pseudo R^2 = .068.

Table 12. Significance summary table

Independent Variables	NCLEX-RN® Failure		Nursing Program Failure	
	ES	*p*	*ES*	*p*
Bivariate Preliminary Analyses*				
English Course Repeated	*ns*	*ns*	.100	.022
Math Course Repeated	*ns*	*ns*	.210	< .001
Science Course Repeated	*ns*	*ns*	.160	< .001
Chemistry Course Repeated	.120	.018	.110	.009
Number of Prerequisite Courses Repeated	*ns*	*ns*	.150	< .001
Number of Prerequisite Course Types Repeated	*ns*	*ns*	.210	< .001
Repeated Pathophysiology and Pharmacology I	*ns*	*ns*	.280	< .001
Repeated Pathophysiology and Pharmacology II	.200	< .001	.110	.002
Repeated Health Assessment of the Individual Lab	*ns*	*ns*	.220	< .001
Repeated Nursing Courses	.250	< .001	.290	< .001
Repeated Lecture Courses	.230	< .001	.260	< .001
Repeated Early Clinical Courses	*ns*	*ns*	.250	< .001
Number of Nursing Courses With Part-Time Faculty	*ns*	*ns*	.300	< .001
Number of Early Clinical Courses With Part-Time Faculty	*ns*	*ns*	.090	.014
GPA *t*-tests†				
Cumulative vs. Degree GPA (Completed Program)	--	--	-.470	< .001
Cumulative vs. Degree GPA (Failed Program)	--	--	-.830	< .001
Cumulative vs. Degree GPA (Passed NCLEX)	-.490	< .001	--	--
Cumulative vs. Degree GPA (Failed NCLEX)	-.780	< .001	--	--
GPA Difference (Program Completion)	.670	< .001	--	--
Binary Logistic Regression Analyses‡				
Cumulative GPA	.023	.003	*ns*	*ns*
Repeated Nursing Courses	4.128	< .001	4.162	< .001
Number of Nursing Courses With Part-Time Faculty	*ns*	*ns*	.246	< .001

Note. *cross tabulations with chi-square analyses; † paired and independent samples *t*-test analyses; ‡ primary logistic regression analyses; *ES* = effect size; *ns* = non-significant associations; -- denotes non-applicable associations due to non-applicable grouping variables for *t*-tests.

4. Discussion

This research has implications for nursing education. The results may be utilized to modify admission requirements to admit students that have a higher probability of being successful in the nursing program and on the NCLEX-RN®. Admission requirements may be modified in the form of GPA requirements or repeated courses allowed. In contrast, data may be utilized to identify at risk students so faculty can implement programs to aid in student success. This will help provide a greater number of successful graduate nurses in order to alleviate the nursing shortage.

This study was conducted at one university with a BSN nursing program. Therefore, future research should include different universities with different levels of RN preparation. Future settings should include rural and urban universities in order to generalize results to a larger population.

Given the limited research available regarding the effectiveness of part-time faculty compared to full-time faculty, further research is needed to determine if a significant difference exists between part and full time faculty. Identifying this information could possibly guide administration and faculty to develop faculty development programs in order to orient new and part-time faculty and also make the part-time faculty aware of the teaching expectations of the courses.

Finally, further research is needed to isolate specific variables that predict program non-completion or NCLEX-RN® failure. This will help faculty identify at risk students and then develop appropriate programs to increase the likelihood of success for these students. Faculty may also modify admission requirements based on future research in order to admit students that are likely to succeed.

Conflicts of Interest Disclosure

The author declares that there is no conflict of interest.

ISSN 1925-4040 E-ISSN 1925-4059

REFERENCES

[1] Halstead J. Nurse educator competencies: Creating an evidenced-based practice for nurse educators. National League for Nursing: New York, NY. 2012.

[2] Commission on Collegiate Nursing Education. Standards for accreditation of baccalaureate and graduate nursing programs. 2013. Available from: http://www.aacn.nche.edu/ccne-accreditation/Standards-Amended-2013.pdf

[3] Southeastern Louisiana University. University Catalog. Available from: http://www.southeastern.edu/admin/rec_reg/university_catalogue/

[4] Polit D, Beck C. Nursing research: Principles and Methods (10th ed.). Philidelphia, PA: Lippincott Williams & Wilkins; 2016.

[5] McGahee T, Gramling L, Reid T. NCLEX-RN success: Are there predictors? Southern Online Journal of Nursing Research. 2010; 10: 208-221.