Predictors of Success in a Graduate Nurse Practitioner Program

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Abstract

Background**:** Prior research studies on the predictors of success in nurse practitioner programs have not focused on students in rural areas.

Purpose**:** The purpose of this study was to examine factors that influence student success in a rural nurse practitioner program in the Southeastern United States.

Methods: Admission data from family nurse practitioner students at a rural university were obtained from a secured drive and transcribed into an Excel spreadsheet. Bivariate analysis using independent *t*-tests for continuous variables and chi-square tests for categorical variables was

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conducted to determine group differences between successful and unsuccessful students by demographic and education factors.

Results: A total of 84 students were enrolled in the family nurse practitioner program, including 70 (83.3%) females and 14 (16.7%) males. Student demographics included 15 (17.9%) African American, 67 (79.8%) Caucasian, one (1.2%) American Indian or Alaska Native, and one (1.2%) Asian, with 67 (80%) residing in the local rural Pee Dee Region. Of the 84 students, 49 (58.3%) successfully completed the program and 35 (41.6%) were unsuccessful and either withdrew or were dismissed. African American students had decreased rates of program enrollment and completion compared to Caucasian students, with only 3 (20%) of the 15 enrolled students successfully completing the program.

Conclusions: Identification and examination of sociodemographic and education factors influencing student success in southeastern rural nurse practitioner programs may improve overall program completion rates, facilitate program success for minority students, and increase the diversity of the nurse practitioner workforce.

Keywords: academic success, nursing students, school admission criteria, nurse practitioner

Predictors of Success in a Graduate Nurse Practitioner Program

Nurse practitioners (NPs) have been vital in providing healthcare in rural and underserved areas where primary care provider physician shortages are most prevalent (Streeter, Zangaro, & Chattopadhyay, 2017). The United States (U.S.) Health Resources and Service Administration (HRSA) recently released primary care physician workforce data for 2013 and projected models for workforce supply for the year 2025. Prediction models forecast significant shortages in U.S. Midwest and southern regions with an expected deficit of over 700 primary care physicians in the

state of South Carolina (Streeter et al., 2017). According to the American Association of Nurse Practitioners (AANP) (n.d.), 86.6% of NPs are certified in a primary care area with 77.8% providing primary care. In order to continue to meet the nation's healthcare needs, nurse practitioner students must successfully complete a graduate nursing program and subsequently pass a certification examination. Graduate nurse practitioner students who are from rural areas and attend a local rural-based graduate nurse practitioner program are likely to both reside and practice in the region after completing their program of study (Skillman, Kaplan, Andrilla, Ostergard, & Patterson, 2014). In order to retain local rural-dwelling students, it is important to understand the factors most important to student success in rural graduate family nurse practitioner programs.

The U.S. Census Bureau (2010) defines rural as the population, housing, and territory not included in an area with at least 50,000 residents. Although the county in which the university is located has more than 50,000 residents, the city comprises the majority of the population with approximately 37,778 residents in 2017 (U.S. Census Bureau, 2017). The remaining residents are spread throughout nearly 800 square miles of small towns and rural farmlands. The graduate program is comprised of both online and on-campus curriculum components, and many commuter students live in surrounding counties that are designated as rural by the Federal Office of Rural Health Policy (Health Resources and Services Administration [HRSA], n.d.a.).

The Pee Dee region that surrounds the University is a largely rural area comprised of 12 counties (HRSA, n.d.b). Eight of the 12 counties are designated as rural, with three counties having portions of the counties defined as rural. Only one county in the region is not designated as being rural (HRSA, n.d.b). The South Carolina Department of Health and Environmental Control, Bureau of Community Health and Chronic Disease Prevention ([SC,DHEC,BCHCDP], 2016) provided statistical information on the population and health rankings for this region. The region

is 59% Caucasian, 35% Black, 4% Hispanic, and 2%. Seven of the 12 counties in this region of the state rank in the bottom third of county health rankings. Three counties in the region are designated health provider shortage areas with between 16% and 25% of county residents reporting inability to access a health care provider due to cost. The above data indicates there is a need for more nurse practitioners to meet the healthcare needs of this rural, underserved region.

Three factors found to predict student success in graduate nursing programs were the admission grade point average (GPA), nursing GPA, and undergraduate science GPA (Ortega Burns, Hussey, Schmidt, & Austin, 2013; Patzer et al., 2017). Similarly, undergraduate GPA has been found to be indicative of graduate GPA (El-Banna et al., 2015). At a large, public, Midwestern urban university, a formula for graduate doctor of nursing practice admissions was developed, which included a weighting of 70% for GPA, 15% for the professional statement, and 15% for the three recommendation letters (Creech & Aplin-Kalisz, 2011). A national investigation of rural nursing programs found barriers to student recruitment included program expense, distance of commute to campus, and work schedule considerations (Skillman et al., 2014). However, there is limited data on barriers to program completion or factors contributing to student success in those rural nurse practitioner programs. There is a need for more research on the predictive factors for graduate nursing success. Prior research studies on the predictors of success in nurse practitioner programs have not focused on students in rural areas. The purpose of this study was to examine data on the factors that influence student success in a rural nurse practitioner program in the southeastern US.

Theoretical Framework

Tinto's Model of Student Departure provides a framework for considering the predictors of student attainment and persistence (Tinto, 1993). According to Tinto, a student's decision to

withdraw from a university occurs due to both student characteristics, including pre-entry attributes and goal commitments, and his or her academic, environmental and social integration in an institution. Pre-entry attributes include factors such as family background, abilities, skills, and prior schooling. Goal commitments refers to the intentions of the student when entering the program and external commitments by the student to family, friends, work obligations, and others.

Tinto (1993) identified that African American students, students from low-income families, and adult students required individualized interventions to decrease attrition. Although Tinto's model was originally designed for undergraduate students, it may be applicable to graduate nursing students.

Methods

Data collection.

The study was conducted through academic admission record review of family nurse practitioner students at a rural, public university in the southeastern US with expected graduation dates of December 2016 and December 2017. Approval for the study was received from the University's Institutional Review Board. The protocol approval number is 09-26-2017-008. Data were extracted from a secured drive and transcribed into an Excel spreadsheet, with the collected data providing program information for the phase I analysis of a multi-phase study. A small sample size was expected due to few cohorts with both program admission and completion information. Phase I included extraction of pre-entry attributes data from both successful (program graduate) and unsuccessful (non-program graduate) students and included demographic and education variables (Table 1).

Table 1

Study Variables

Variable Name	Classification / Categories	Determination	Variable Level
	Dependent Outcome Variable		
Success	Success = graduated Non –success = Withdrew or dismissed	Program completion and exit data	Nominal
	Demographic Outcome Variables		
Gender	Male Female	Self-identified in admission record	Nominal
Race	White or Caucasian Black or African American American India or Alaska Native Asian	Self-identified in admission record	Nominal
Ethnicity	Hispanic / Latino Non-Hispanic Latino	Self-identified in admission record	Nominal
Age	N/A represented as Mean (SD)	Birth Year in record	Ratio
	Education Independent Variables		
College/University where obtained BSN	Study Site Other SC College/University [i] Non-SC Based College/University [ii]	Official Transcripts	Nominal
RN to BSN Status	Previously completed a RN to BSN program (Yes/No)	Official Transcripts	Nominal
BSN GPA	N/A represented as Mean (SD)	Official Transcripts	Ratio
Miles from campus	N/A represented as Mean (SD)	Permanent address in admission record	Ratio
Rurality [iii]	Pee Dee Residents Non-Pee Dee Residents	HRSA Grant Eligibility	Nominal
	Undergraduate Course Grade Point Average (GPA)		
Microbiology	N/A represented as Mean (SD)	Official Transcripts	Ratio
Anatomy	N/A represented as Mean (SD)	Official Transcripts	Ratio
Physiology	N/A represented as Mean (SD)	Official Transcripts	Ratio
Science [iv]	N/A represented as Mean (SD)	Official Transcripts	Ratio
	Masters of Science of Nursing (MSN)		
MSN GPA	N/A represented as Mean (SD)	Official Transcripts	Ratio

[i] Includes 7 South Carolina based colleges or universities. [ii] Includes 9 non-South Carolina based colleges or universities. [iii] Rurality defined as HRSA Grant Eligibility (HRSA, n.d.b). [iv] Average GPA for undergraduate science courses: Anatomy, Physiology, & Microbiology.

Data analysis.

Data were de-identified in the Excel spreadsheet and imported into SPSS Statistics for Mac (Version 24.0). Data were screened for missing values, outliers, potential transcription errors, and normality. Descriptive statistics were computed for student demographic variables and education characteristics. Independent *t*-tests and chi-square tests were used to determine differences between successful and unsuccessful students. For the variables of race and location of undergraduate BSN institution (study site or within/outside of the state of South Carolina), those categories with very few students were collapsed to strengthen the chi-square analysis. Undergraduate Anatomy, Microbiology, and Physiology GPA were combined into an Undergraduate Science GPA variable. Group differences were reported using 95% confidence intervals and alpha was set at 0.05.

Results

During the study time period, 84 students were enrolled in the family nurse practitioner program, including 70 (83.3%) females and 14 (16.7%) males. Of these students, 15 (17.9%) were African American, 67 (79.8%) were Caucasian, one (1.2%) was American Indian or Alaska Native, and one (1.2%) was Asian. Eighty percent of these students provided permanent addresses in the admission record that corresponded to a location in the rural Pee Dee Region. Bivariate analyses (Table 2) revealed that 49 (58.3%) of the enrolled students successfully completed the program, with 35 (41.7%) exiting the program unsuccessfully. Of the 15 enrolled African American students, 12 (80%) were unsuccessful in completing the program compared to 23 (34.3%) Caucasian students ($p = 0.003$). Additionally, students who were unsuccessful in program completion were older and had a mean age of 38.7 (10.9) years compared to 35.6 (8.7)

years for successful students (p = 0.2). Undergraduate BSN institution was a non-significant factor, as was the mean number of miles students lived away from campus. Mean undergraduate BSN GPA was higher for successful students 3.5 (SD = 0.36) when compared to unsuccessful students 3.36 (SD = 0.39) (p = 0.1). Although age and BSN GPA were non-significant factors, there are apparent differences between the groups that may be significant in a larger sample size of the population.

Table 2

Student Characteristics Overall and by Level of Success (graduated vs. did not graduate)

Variable n (%)	Overall (n=84)	Level of Success		*p*-value
		Did Not Graduate (n=35)	Graduated (n=49)	
Gender				0.6
Male	14 (16.7)	5 (35.7)	9 (64.3)	
Female	70 (83.3)	30 (42.9)	40 (81.6)	
Race				0.003[i]
White or Caucasian	67 (79.8)	23 (34.3)	44 (65.7)	
Black or African American	15 (17.9)	12 (80)	3 (20)	
American Indian or Alaska Native	1 (1.2)	0 (0.0)	1 (100)	
Asian	1 (1.2)	0 (0.0)	1 (100)	
Ethnicity				NA
Hispanic/Latino	1 (1.2)	1 (100)	0 (0.0)	
Age, mean (SD)	36.9 (1.1)	38.7 (10.9)	35.6 (8.7)	0.2
Rurality				0.3
Pee Dee Resident [ii]	67 (80)	26 (38.8)	41 (61.2)	
Non-Pee Dee Resident [ii]	17 (20)	9 (52.9)	8 (47.1)	
BSN College/University				0.3
Study Site	43 (51.2)	18 (41.9)	25 (58.1)	
Other SC College/University [iii]	27 (32.1)	9 (33.3)	18 (66.7)	
Non-SC College/University [iv]	14 (16.7)	8 (22.9)	6 (42.9)	
RN to BSN	38 (45.2)	16 (45.7)	22 (57.9)	0.9
BSN GPA, M (*SD*)	3.45 (0.38)	3.36 (0.39)	3.5 (0.36)	
Miles from campus, M (*SD*)	41.1 (3.2)	42.8 (27.6)	39.9 (30.7)	0.7
Undergraduate Course / Science GPA				
Microbiology	3.0 (0.1)	3.0 (0.8)	3.1 (0.8)	0.6
Anatomy	3.1 (0.1)	3.0 (0.9)	3.2 (0.8)	0.2
Physiology	3.1 (0.1)	3.1 (0.7)	3.1 (0.7)	0.8
Science [v]	3.1 (0.1)	3.0 (0.7)	3.2 (0.6)	0.4
Masters of Science Degree (MSN) GPA				

Variable n (%)	Overall (n=84)	Level of Success		*p*-value
		Did Not Graduate (n=35)	Graduated (n=49)	
MSN	3.3 (0.1)	2.2 (0.7)	3.7 (0.2)	<0.001

[i] P-value obtained for 3 categories: White, Black, & Other (American Indian or Alaskan Native, Asian).
[ii]Determined by reviewing student home zip codes and counties listed in "Pee Dee Region" as defined by South Carolina Department of Health and Environmental Control (n.d.) Regional Health Care Coalitions. [iii] Includes 7 South Carolina based colleges or universities. [iv] Includes 9 non-South Carolina based colleges or universities. [v] Average GPA for undergraduate science courses: Anatomy, Physiology, & Microbiology.

Discussion

Analysis of program admission data revealed suboptimal program completion rates for local Pee Dee residents and African American students. Additionally, students with mean undergraduate GPAs below 3.5 were less successful in program completion. There were no conclusive demographic or education factors for program success among the students.

African American nurse practitioners are underrepresented in the workforce and in graduate nurse practitioner programs despite the need for a more diverse nursing workforce to meet the nation's healthcare needs (National League for Nursing, 2016). Membership demographics for the AANP (2010) revealed that 90.3% of members are Caucasian. In a 2016-2017 national survey, 13.9% of students who graduated from master's in nursing NP and post-master's NP programs were African American, while 66.0% of students were Caucasian (American Association of Colleges of Nursing, 2018). The program completion rates do not correspond with the nearly 40% of ethnic minorities representing the U.S. population and local community (SC, DHEC, BCHCDP, 2016; U.S. Census Bureau Quick Facts, 2017).

Supporting minority students to successfully graduate nursing programs is of great importance in order to develop nurse practitioners that represents the demographics of the surrounding population and meet the healthcare needs of rural diverse communities. Understanding factors that positively and negatively influence minority student success can aid graduate nursing programs to support and respond to the unique needs of rural minority students.

For this Phase I analysis, barriers for rural and African American students for successful program completion were not clear given the information available in the academic admission records. Thus, a Phase II qualitative study is planned to investigate barriers and facilitators to successful program completion for African American students who have previously been enrolled in the program. Phase II will include focus group sessions led by African American nurse practitioners to interview former African American students to discuss both program and socio-demographic factors that influenced their success in the program.

Several themes have been cited in the literature as barriers to minority student success. Isolation and loneliness, discrimination and a lack of cultural competence by faculty, peers, patients, and staff, and lack of emotional and advisory support have been frequently identified in the literature (Loftin, Newman, Dumas, Gilden, & Bond, 2012; Murray, 2015; Veal, Bull, & Miller, 2012; Gardner, 2005). These themes, highlighting a lack of social integration, are consistent with factors identified in Tinto's Model of Student Departure as influencing a student's decision to depart from an institution (Tinto, 1993).

Factors associated with minority student success includes program and personal factors. The presence of academic support, mentoring, and a minority student association are positive program factors (Loftin et al., 2012; Murray, 2015; Veal et al., 2012). Integration and inclusivity within the program and among peers is also very important (Murray, 2015; Veal et al., 2012). Academic progression, defined as successfully obtaining knowledge and proceeding to the next course, helps instill confidence (Veal et al., 2012). Personal characteristics associated with success include determination, overcoming obstacles, and a resolve to succeed (Loftin et al., 2012; Gardner, 2005). These factors showing positive social, academic, and environmental integration and positive intentions by students are consistent with the elements of Tinto's Model of Student Departure

found to support student retention (Tinto, 1993). Phase II findings will be analyzed and interventions will be tailored to meet the specific needs of rural and African American students in the program in an effort to increase student success.

Limitations

Although the generalizability of the phase I results is limited due to sampling from one rural nurse practitioner program and a small sample size, findings revealed important group differences and warrant further investigation. The limited nature of the information available in the admission record hindered understanding of the influence of programmatic and socio-demographic factors on both overall and African American successful program completion. In response to these limitations, a Phase II qualitative exploration is planned to gain understanding of barriers and facilitators to successful program completion. Although location of the institution and distance of student residence from campus were non-significant in this analysis, focus group sessions may reveal additional barriers unique to rural-dwelling students and their access to program support services. Additionally, future study phases will include replication of the quantitative analysis and a logistic regression analysis using a larger number of student cohorts to increase power and generalizability of findings.

Conclusion

Decreased successful program completion rates overall and for both rural and African American students in a southeastern US rural graduate nurse practitioner program are not well understood by examination of admission factors and criteria. However, understanding barriers and facilitators to successful program completion for African Americans is vital to providing tailored support for these minority graduate students. There is a need for more research to better understand the perceived beliefs and barriers experienced by rural minority students and how those beliefs are

related to successfully completing a family nurse practitioner program. Focus groups with successful and unsuccessful nurse practitioner students may provide qualitative data on this population and pathways to support minority student success. By identifying and ameliorating the factors associated with minority student success, it may be possible to increase minority students' graduation rates and to ultimately see the number of minority advance practice registered nurses increase to be more representative of the population being served.

References

American Association of Colleges of Nursing. (2018). *2017 - 2018 enrollments and graduations in baccalaureate and graduate programs in nursing*. Washington, DC: American Association of Colleges of Nursing.

American Association of Nurse Practitioners. (n.d.). NP fact sheet. Retrieved from https://www.aanp.org/all-about-nps/np-fact-sheet

American Association of Nurse Practitioners. (2010, May). 2010 membership demographics. Retrieved from https://www.aanp.org/research/10-research/146-member-demographics

Creech, C. J., & Aplin-Kalisz, C. (2011). Developing a selection method for graduate nursing students. *Journal of the American Association of Nurse Practitioners*, *23*, 404 - 409. https://doi.org/10.1111/j.1745-7599.2011.00626.x

El-Banna, M. M., Briggs, L. A., Leslie, M. S., Athey, E. K., Pericak, A., Falk, N. L., & Greene, J. (2015). Does prior RN clinical experience predict academic success in graduate nurse practitioner programs? *Journal of Nursing Education*, *54*, 276 - 280. https://doi.org/10.3928/01484834-20150417-05

Gardner, J. (2005). Barriers influencing the success of racial and ethnic minority students in nursing programs. *Journal of Transcultural Nursing, 16*, 155 - 162. https://doi.org/10.1177/1043659604273546

Health Resources and Services Administration [HRSA] (n.d.a.). Defining rural population. Retrieved from https://www.hrsa.gov/rural-health/about-us/definition/index.html

Health Resources and Services Administration [HRSA] (n.d.b). Rural health grants eligibility indicator. Retrieved from https://datawarehouse.hrsa.gov/tools/analyzers/geo/Rural.aspx

Loftin, C., Newman, S. D., Dumas, B. P., Gilden, G., & Bond, M. L. (2012). Perceived barriers to success for minority nursing students: An integrative review. *International Scholarly Research Network Nursing, 2012,* 1 - 9. https://doi.org/10.5402/2012/806543

Murray, T. A. (2015). Factors that promote and impede the academic success of African American students in prelicensure nursing education: An integrative review. *Journal of Nursing Education*, *54*(9), S74 - S81. https://doi.org/10.3928/01484834-20150814-14

National League for Nursing. (2016, February). Achieving diversity and meaningful inclusion in nursing education: A living document from the National League for Nursing. Retrieved from http://www.nln.org/docs/default-source/about/vision-statement-achieving-diversity.pdf?sfvrsn=2

Ortega, K. H., Burns, S. M., Hussey, L. C., Schmidt, J., & Austin, P. N. (2013). Predicting success in nurse anesthesia programs: An evidence-based review of admission criteria. *AANA Journal, 81*, 183 - 189.

Patzer, B., Lazzara, E.H., Keebler, J.R., Madi, M.H., Dwyer, P., Huckstandt, A.A., & Smith-Campbell, B. (2017). Predictors of nursing graduate school success. *Nursing Education Perspectives, 33*, 272 - 274. https://doi.org/10.1097/01.NEP.0000000000000172

Skillman, S., Kaplan, L., Andrilla, C.H.A., Ostergard, S., & Patterson, D. (2014). Support for rural recruitment and practice among U.S. nurse practitioner education programs. Policy brief #147, Rural Health Research & Policy Centers. Retrieved from http://depts.washington.edu/uwrhrc/uploads/RHRC_PB147_Skillman.pdf

South Carolina Department of Health and Environmental Control (n.d.). SC DHEC HPP Regional Health Care Coalitions. South Carolina public health region snapshot. Counties listed in Pee Dee region as determine by map retrieved from http://www.scdhec.gov/Health/FHPF/EPHF/GrantRequirements/StaffContacts/

South Carolina Department of Health and Environmental Control, Bureau of Community Health and Chronic Disease. (2016). South Carolina public health region snapshot. Retrieved from http://scaledown.org/pdf/Region%20Snapshots%202016.pdf

Streeter, R., Zangaro, G., & Chattopadhyay, A. (2017). Perspectives: Using results from HRSA's health workforce simulation model to examine the geography of primary care. *HSR: Health Services Research, 52*(1). https://doi.org/10.1111/1475-6773.12663

United States Census Bureau (2017, July 1). Quick Facts. Retrieved from https://www.census.gov/quickfacts/fact/table/florencecountysouthcarolina,florencecitysouthcarolina,US/PST045217

United States Census Bureau. (2010). 2010 Urban and rural classification and urban area criteria. Retrieved from https://www.census.gov/geo/reference/ua/urban-rural-2010.html

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*, 2nd (ed.), Chicago: University of Chicago Press.

Veal, J. L., Bull, M. J., & Miller, J. F. (2012). A framework of academic persistence and success for ethnically diverse graduate nursing students. *Nursing Education Perspectives*, *33*, 322 - 327. https://doi.org/10.5480/1536-5026-33.5.322