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Measuring the Success of a Pipeline Program to Increase Nursing Workforce Diversity

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Abstract

The purpose of this study was to understand changes in knowledge and opinions of underserved American Indian and Hispanic high school students after attending a 2-week summer pipeline program using and testing a pre/post survey. The research aims were to: a) psychometrically analyze the survey to determine if scale items could be summed to create a total scale score or subscale scores; b) assess change in scores pre/post program; and c) examine the survey to make suggestions for modifications and further testing to develop a valid tool to measure changes in student perceptions about going to college and nursing as a result of pipeline programs. Psychometric analysis indicated poor model fit for a 1-factor model for the total scale and majority of subscales. Non-parametric tests indicated statistically significant increases in 13 items and decreases in 2 items. Therefore, while total scores or sub-scale scores cannot be used to assess changes in perceptions from pre- to post-program, the survey can be used to examine changes over time in each item. Student did not have an accurate view of nursing and college, and underestimated support needed to attend college. However students realized that nursing was a profession with autonomy, respect, and honor.

The pipeline refers to programs at all levels of education intended to target, enroll, and support to graduation certain students, usually underrepresented students including minority, low income, and women, with the goal of increasing their representation in certain fields. For instance, in the health sciences the goal of pipeline programs is to increase college graduation and career attainment in professional or research degrees of minority and underserved or underrepresented students. Pipeline strategies often address awareness and knowledge of professions and science, as well as income through financial aid and connect students to mentors and others who can help with academics (Katz, 2007; Katz, Smart & Paul, 2010). In a survey of federal K-12 pipeline programs, outreach (52%) was the most

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frequently employed strategy, followed by mentoring (32%), academic enrichment, (27%), and scholarships (16%) (Danek and Borrayo, 2012). Among strategies for students attending college, pre-matriculation and post baccalaureate programs were considered by schools as most successful in increasing underrepresented students in public health, medicine, dentistry, and in nursing. In nursing, success in increasing baccalaureate (BSN) prepared graduates has been seen in programs that offered community college students a seamless bridge to a BSN program.

Pipeline programs can be successful in recruiting and graduating underserved and underrepresented minority and disadvantaged students in the health sciences (Danek & Borrayo, 2012; Johnson & Bozeman, 2012; Toney, 2012). Data concerning pipeline success comes primarily from schools tracking changes in student demographics rather than from data about specific pipeline strategies. Universities attribute their successes to pipeline program strategies, stating such strategies are more helpful than others, e.g., one time outreach and recruitment, short-term programs (Danek & Borrayo). Yet, due to a wide variety of strategies used within pipeline programs to increase underrepresent students in the health sciences, including STEM (science, technology, engineering, and math) programs, it is difficult to measure the effectiveness of any one. This study looked at one strategy in a pipeline program, a summer enrichment residency program, to determine effectiveness of changing high school participant's perceptions and knowledge of going to college and of nursing.

Pipeline programs can benefit students who may not have accurate perceptions or knowledge about nursing and other health careers. For instance, a common component of pipeline programs is job shadowing. Job shadowing can change high school students' views of nursing to become more accurate and thus more favorable (Katz & ONeal, 2011; Porter, Edwards & Granger, 2009). Another similar intervention used in pipeline programs is simulation to replicate job-shadowing experiences. In a study of 30 high school students in the U.K., students reported much higher understanding of nursing and a greater interest in the profession after attending a simulation program (Rush, Shepard, Firth & Marks-Maran, 2013). An example of a successful pipeline program is Baylor Dental School. They have increased the number of minority students more than any other non-minority school in the U.S (Lacey, McCann, Miller, Solomon & Reuben, 2012). The dentistry program attributes their success to four strategies: 1) increasing student awareness and interest in dental careers in high school; 2) providing academic classes; 3) preparing students for admissions; and 4) supporting students to graduate. Pre-collegiate factors were also seen as critical in health career choice and achievement in a study using statistical modeling (Hinton, Howell, Merwin, et. al., 2009).

Other important influences in increasing minority students in health careers are reported by the National Institutes of Health Research Initiative for Science Excellence (RISE) who advocate providing pre-licensure students with financial and mentoring experiences (Schultz, Hernandez, Woodcock, et al. 2012); strategies supported in many studies of pipeline programs (Katz & ONeal, 2011). In addition, minority students may have needs that differ significantly from majority students. For instance, young African American students indicated "personal influences," "career opportunity," and "self-efficacy" as much stronger

influences on enrollment compared to Caucasian students (Barfield, Cobler, Lam, Zhang & Chitiyo, 2012). The influence of elf-efficacy was also deemed important at two summer pipeline programs provided by Pennsylvania State University. Among the 62 pipeline students studied, self-efficacy scores, interest, and intent to attend college increased significantly after attending the pipeline program (Baber, Pifer, Colbeck & Furman, 2010).

Pipeline programs specifically offered to AIAN students include the University of Alaska Anchorage School of Nursing's Project RRANN (Recruitment and Retention of Alaska Natives into Nursing). In the seven years they reported 66 AIAN students enrolled in the Associate's degree or Bachelor's degree in nursing programs. The RRANN project focused on creating community partnerships and faculty student connections with high school, pre-nursing, and associate and bachelor's degree students (DeLapp & Hautman, 2008). Another AIAN program is the Na-ha-shnee Summer Institute at Washington State University. This program employs a 2 week residency program with intensive classes for high students on math, chemistry, and English as well as cultural classes, job shadowing, mentorship, and hands on labs experiences (Katz, Smart & Paul, 2010). To date, the program has seen over 100 students enrolled in health science career programs.

Another avenue to minority student recruitment are STEM (science, technology, engineering and math) education programs. STEM recruits students into science careers by utilizing familiar pipeline strategies, e.g., job shadowing, improving self-efficacy through work and lab experiences, role modeling, and mentoring. STEM pipelines have been studied in part for their failures, or what some termed, a leaky pipeline, in specific reference to the failure to increase women scientists at universities (Pell, 1996). The National Academy of Science (NAS) also applied the leaky pipeline term to efforts to recruit minority students into research careers (Committee for the Assessment of NIH Minority Research Training Programs, 2005). However, NAS described the leaky pipeline as not necessarily an indication of failure, but an expected consequence of people leaving to fulfill other commitments possibly returning later to graduate or obtain graduate degrees. The leaky pipeline analogy has been extended to include community based participatory research. In a strengths based approach students leaving the pipeline to return to their communities could become liaisons to improve community campus partnerships (James, Starks, Segrest & Burke, 2012). This concept was especially relevant for AIAN communities where distrust of universities may inhibit partnerships making a strength based focus critical to success. As such, AIAN students leaving the pipeline are not seen as failures, but critical to partnerships.

A 2010 survey of tools to measure nursing pipeline programs analyzed 22 studies and found that 80% of participants were non Hispanic white students (Matutina, Newman& Jenkins). Only one used a theoretical framework and 30% reported no statistical reliability strategies. The survey reported here stood out among the others for its sample of primarily American Indian participants and for including males. The work by Matutina, Newman, and Jenkins in part provides rationale for the current study and, importantly, it calls for sound tools to measure the results of pipeline programs. In addition, the need for intervention studies along with in-depth reporting of strategies and challenges are needed (Condon, Morgan, Miller, Mamier, Zimmerman, & Mazhar, 2014; Loftin, Newman, Gilden, Bond & Dumas, 2013).

The need for a diverse health workforce has not diminished in the decades educators, providers, and communities have been working to educate and graduate health care students that represent the U.S population (Katz, ONeal, Stickland, Doutrich, 2010). Greater than 30% of the U.S. population identifies as Hispanic while only 9% of physicians, 6% of nursing, 7% of dentists, and 10% of pharmacists share the same identification (Sullivan and Suez Mittman 2010). In addition, the American Medical Association reports that the need for physicians will increase by 30% in 2015 to meet needs for 2025. In nursing there is a need to increase the number of BSN nurses to 80%, or 260,000, by 2025 (Bolton, 2010). Currently, 39% are ADNs and 36% BSN (Budden, Zhong, Moulton, & Cimiotti, 2013). Recommendations to address the shortage and increase diversity include identifying and measuring interventions that work, interprofessional and community collaborations and partnerships, and improvements in data gathering systems (Danek & Borrayo, 2012; Mittman & Sullivan, 2011).

Theoretical Framework

The motivation for this study comes from the literature about social determinants of health and inequality and health (Marmot, 2009; Wilkenson & Pickett, 2009). The need to reduce health disparities is partly framed by considering more than race or ethnicity, rather it is framed by social determinants of health. Pipeline programs address the latter by reducing barriers created by social conditions. Further, education is associated with better health status (Freudenberg & Ruglis, 2007) and on a community level by potentially providing much needed health care providers.

To better understand both the changes in knowledge and opinions of high school students after attending a 2-week summer pipeline program, this study build on previous work using the same tool (Benavides-Vaello, Katz, Peterson, Paul & Allen, et al 2014; Katz, 2007; Katz, 2005; Katz & ONeal, 2011; Katz, Smart & Paul, 2010). Therefore, our research aims were to 1) psychometrically analyze the survey to determine if the items on the scale can be summed to create a total scale score or subscale scores; 2) assess the change in scores from before and after the program (pre- to post-test) and 3) examine the survey to make suggestions for modifications and further testing to develop a valid tool to measure changes in student perceptions about going to college and nursing as a result of pipeline programs.

METHOD

A quantitative pre/posttest design with an investigator-constructed survey based on a collective case study of American Indian nurses and literature on minority student recruitment was used for this study (Katz, 2005; Kohler & Edwards, 1990; Martin, 1991; Tang et al., 1999; Tate & Schwartz, 1993). The survey, piloted in 2004, was modified based on a qualitative study in 2006 (Katz & ONeal, 2010; Katz, 2007; Katz, Smart & Paul, 2010). The wording of the questions were reviewed by two American Indian consultants, one a nurse and the other the Director of a program to recruit American Indian students in to the health sciences. The survey was designed to measure knowledge and perceptions about college and a career in nursing before and after attending a summer residency program.

Setting

The residency program merged two pipeline programs, one focused on nursing and funded by a Health Resource Service Administration (HRSA) Nursing Workforce Diversity grant. The other focused on the health professions in general and was funded by a university. The two pipeline programs joined together over three consecutive summers (2011–2013) in a collaborative effort to provide a two-week summer residential, on campus experience, to encourage high school students to finish high school, go to college, and eventually, become nursing or other health professionals. During the program, health professionals from similar racial or ethnic extraction as the students' served as role models and mentors. The curriculum was math and science intensive, but also included English course work, cultural experiences, group discussions, and time spent in the human anatomy lab and simulation lab at a community hospital. Counselors included graduate and undergraduate nursing students, a medical student, and an architecture graduate student. The two faculty members of the grant program and university designed and supervised the program.

Participants

Participants were from a convenience sample that was recruited from all students accepted to and attending a summer pipeline program. Students for the summer program were recruited through visits to Tribal schools, local high schools, and through the HRSA Workforce Diversity grant program targeting disadvantaged rural students. HRSA defines rural disadvantaged students as those being from low performing high schools, first generation to attend college, or being from an ethnic/racial minority group. The program director accepted students to the summer program using a competitive process based on GPA and essay. Students accepted to the program and their parents were informed about the study via a letter. High school students who attended the summer program were eligible to take part in the study. Over the three summers data was collected from 115 participants who represented 98% of those eligible, i.e., those accepted to and attending the program.

Procedures

Prior to data collection, parental permissions, student assents, and in some instances where the student was an adult, consents were collected. Assurance was given that participation in the summer program was not dependent on participation in the study. The surveys were confidential and coded to enable researchers to match pretests and posttests with demographic information. Summer program counselors were educated on study procedures and assisted in the coordination of survey administration.

IRB approval was obtained from the university board along with the additional approvals the university requires for working with vulnerable groups, in this case, American Indian and Alaska Natives and minors. It is usual for researchers working with AIAN communities to obtain not only university approval, but approval from the tribe(s) they are working with. Because tribes are sovereign entities it cannot be assumed they will accept university approval; they may or may not view university approval as adequate to protect their people. In the region where this study took place there is a memorandum of understanding among tribes that research approval may come from either the individual tribe, the Indian Health Service review board, or from the university. Because the students attending this program

come from over 47 different tribes it was determined by the regional Indian Health Service that university IRB approval was adequate protection.

Data Collection

The pre-summer program surveys were collected on the day of arrival and post surveys on the final day of the program. Participants were assigned matching pre and post survey numbers to ensure that the data collected was appropriately linked with a prior to and after program experience for each participant.

Measures

A demographic information section of the survey asked year attending program, age, gender, ethnicity/tribal affiliation, year in school, grade point average, class with highest grade, and people who had influenced the participant into going into nursing. The nursing knowledge and perceptions survey consist of 43 items, grouped into 7 sections: Going to College, Working as a Nurse, Nurses can, Important reasons I DO want to be a Nurse, Important reasons I DO NOT want to be a Nurse, average nursing salary, and 2 open-ended questions asking about thoughts on what nurses do and any questions related to nursing as a career. All but the latter two were analyzed for this study. Likert-type response categories (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) were used for Going to College, Working as a Nurse, and Nurses can. Dichotomous response categories (Yes/No) were used for Important reasons I DO want to be a Nurse, and Important reasons I DO NOT want to be a Nurse. Salary ranges were given for the average nursing salary question ($30,000–$40,000, $40,000–$50,000, $50,000–$60,000, $60,000–$70,000, Over $70,000).

Data analysis

Descriptive statistics were utilized for participant characteristics. Preliminary item analysis was performed to examine the distribution of each item. Exploratory factor analysis using weighted least squares mean and variance adjusted estimation was then used to determine if the factor structure of the 6 sub-scales and total scale were psychometrically valid for the dichotomous items. Model fit indices for comparative fit index (CFI; ≥0.90), root mean square error of approximation (RMSEA; ≤0.080) and standardized root mean square residual (SRMR; study criterion ≤0.080) were used to determine acceptable model fit (Brown, 2006). Wilcoxen-signed ranks tests for continuous items and McNemar tests for dichotomous items (non-parametric tests) were used to test differences from pre-test to post-test for each item if the factor analysis did not indicate a valid factor structure. *P*-values (two-tailed) of ≤ .05 were used to indicate significance. Mplus version 7.11 (Muthén & Muthén, 1998–2013) was used for the factor analysis and SPSS version 22 (Armonk, NY: IBM Corp) was used for the item analysis and non-parametric testing.

RESULTS

Table 1 is a description of the sample showing that the majority of participants were female (90.4%), AIAN (47.8%) or Hispanic (22.6%), and attending the program for the first time (72.2%). When asked to indicate which courses they did the best at in school, most students rated themselves as doing best in English and Science with fewer doing best in math or art

and music. Participants also indicated that they had an average of three people who influenced to go to college and enter a health field. These were often a mother or grandmother, but also included grandfathers, fathers, brothers, aunts, teachers, and counselors.

Item analysis indicated that items were non-normal (skewed and peaked) and not all response categories were used. Therefore, item responses were recoded into 2 response categories: 0 = disagree or strongly disagree and 1 = agree or strongly agree for the factor analyses. The results of the factor analysis indicated poor model fit for a 1-factor model for the total scale and 4 of the 6 subscales (Table 3). The 2 subscales that had good fit had items with non-significant factor loadings or model convergence issues. Therefore, the items were analyzed individually using Wilcoxen signed-ranks test for continuous items and McNemar tests for dichotomous items. The non-parametric tests were done using all 4 response categories when applicable.

The non-parametric tests indicated statistically significant increases in 13 items and decreases in 2 items (Table 4). “Going to college” items that had a significant increase in agreement were being worried about being away from home, needing emotional support, and needing motivation to go to college. In regards to “Working as a nurse”, agreement in being powerful, respected by others, honored by community or tribe, and being a role model significantly increased over time, yet being a leader decreased. “Nurses can” items that increased over time were working in community or on reservations and achieving goals like buying a house and car. A significant difference in percent agreement in “Important reasons I DO want to be a Nurse” was found for living where one wants, being respected, and being important to their community or tribe. Lastly, wanting to be a doctor decreased post-program, and expected average salaries for nurses increased.

In summary, the results for the three study aims are as follows:

1. This study determined that a single scale score cannot be analyzed as a good-fitting factor model was not demonstrated. Therefore, change over time can only be analyzed for each item individually;
2. assessing the change in scores from before and after the program (pre- to post-test). Item-by-item analysis showed that…
3. examine the survey to make suggestions for modifications and further testing to develop a valid tool to measure changes in student perceptions about going to college and nursing as a result of pipeline programs..

DISCUSSION

In agreement with the literature on increasing diversity in the nursing and health sciences workforce, our study showed that students intent to go to college increased when they attended programs designed to influence towards this end. This study evaluated the effectiveness of a summer program in affecting high school student’s perceptions and knowledge about going to college and about nursing. It was designed to deepen understanding from the student perspective by ascertaining what factors encouraged them

and which may act as deterrents. Previous work with AIAN students has shown that common barriers include leaving home and finances (Katz, 2005). This study confirmed concerns with leaving home. In addition, after attending the summer program, student participants came to perceive that their need for emotional support and motivation was greater than previously thought.

Explanations for the increase in concern may be seen simply due to the fact that for many students this two week program was their first time away from home, first time on a campus, and first time with an intensive and demanding daily schedule. Students come to the program fully expecting and wanting to go to college, but when the reality of what that life might be like was confronted they may have realized it might take more than they thought to actually attend college. The benefit of a summer program experience may be valuable for exactly this reason. Prospective college students have a chance to become better prepared. Students who are well prepared, for instance, through strong social support (resources such as relationships, guidance, emotional and academic support) and intensive well-funded pipeline programs, e.g., the Stanford Medical Youth Science Program, are more likely to succeed in college (Winkleby, Ned, Ahn, Koehler, & Kennedy, 2009). Likewise, college persistence is affected by perceptions of the campus. Students are more likely to stay in college if they feel safe and comfortable as well as welcome (Thompson, Johnson-Jennings & Natizarim, 2013). Early experiences on a campus may help students with comfort levels merely by exposure and familiarization

Findings from this study also indicate that students in a summer program may come to view nursing and the medical field (physician) differently. Findings from this and previous work show that after the summer program students perceived nurses as having more power, were more respected, and were role models more often than previously thought. In addition, a finding that may be culturally relevant was seen in increased perception of the ability to be honored by their community or tribe for attending college and becoming a nurse. Interestingly, in this study student participants reported a less favorable view of becoming a physician after the program. It can be speculated that students see becoming a doctor as the way to enter the health field and that once supplied with additional information about other health careers, in this case not only nursing, but physical therapy, nutrition, and pharmacy, they realized they had more options. In addition, contrary to our previous work, students had a decrease in their view of nurses as leaders. We plan to examine and compare curriculum content from this year and past years to see if we had fewer nurse speakers or preceptors, and if we had changed any content on career and roles away from stressing the ability and need for nurses to be leaders. This is a key concept for these students many of whom we expect to stay and serve in their communities.

Becoming a college graduate and a nurse also meant the ability to reach financial goals. Participants reported that as a nurse they could buy a house and a car. Most students left the summer program realizing that nurses made more money than previously thought. Another salient point in terms of the effort to address health disparities by addressing education was the view participants held that they could live where they wanted and that they could continue to live and work on their reservation, or community, as a nurse. Grant funders such as HRSA Workforce Diversity are interested in addressing health disparities in

disadvantaged rural communities through educating students who may return to those communities. Although programs such as the one described here emphasizes the ability of the student to make their own choices, the literature shows that minority students do tend to return to their communities (Shipman & Saha, 2006; Winkleby, Ned, Ahn, Koehler, & Kennedy, 2009).

This study supports other work on increasing diversity in the nursing workforce, but adds emphasis to the importance of home and of leaving home. Studies often discuss the intense determination to succeed individual students have while also needing social and family support. (Condon, Morgan, Miller, et al, 2014; Benavides-Vaello, Katz, Peterson, et al, 2014)

Nursing Education Implications and Recommendations

Nurses need to continue to develop and implement pipeline programs that can recruit underrepresented students into college and nursing. Applying for grants from funders such as HRSA is an option, as well as from NIH Bridge and Prep grants. Tribal colleges and tribes have the possibility of applying for federal grants including the NARCH (Native American Research Center for Health) grants. Garnering support through private donors is worthwhile as programs such as the Stanford Medical Youth Sciences Program and others can attest. Partnering within communities may also be successful. High schools and community colleges are often more than willing to supply at least space and outreach for workshops or classes. Community groups such as business associations can volunteer expert time and possibly funds food and travel.

Nursing students can work with recruitment and outreach programs to gain community health experience. Partnering students with faculty research projects or program evaluation is a strategy to not only provide role models for younger students, but to engage older students in research and thoughts of graduate programs.

The Survey

In summary, the study aims and recommendations for further research are based on the aims: 1) psychometrically analyze the survey to determine if the items on the scale can be summed to create a total scale score or subscale scores; 2) assess the change in scores from before and after the program (pre- to post-test) and 3) examine the survey to make suggestions for modifications and further testing to develop a valid tool to measure changes in student perceptions about going to college and nursing as a result of pipeline programs.

Aim 1- The factor analysis indicated that the survey items were not assessing cohesive constructs and therefore, total scores or sub-scale scores cannot be used to assess changes in perceptions from pre- to post-program; analysis must be done for each item individually. Future research will continue to refine the scale and examine the psychometric properties of a revised scale.

Aim 2- Currently, the survey can be used to examine changes over time in each item, separately, as was done here. This item-by-item analysis contributes to the knowledge of changes in each specific perception from pre- to post-program.

Aim 3- The survey is able to measure changes in student's views of college and nursing after attending a pipeline program. The survey was administered to students new to the program, as well as students returning to the program for a second and even a third time, however the small numbers of returning students precluded comparisons based on times students had attended the program. Recommendations for future work would be to provide the program to larger groups. However, from a purely descriptive viewpoint, the finding that students did return for a second and even third time might indicate satisfaction with the program and a continuing desire on their part to pursue college and nursing. The combined sample also maximizes external validity as students are recommended to return to the program for continued support.

Recommendations from this study mirror what others in the field of workforce diversity promote. Intervention studies to better determine what works and longitudinal studies to determine what happens to students who get into BSN programs but drop out, students who never get into a BSN program, and those who graduate and pass the NCLEX exam are needed (Loftin, Newman, Gilden, Bond & Dumas, 2013).

CONCLUSION

Overall this study showed that students may not have an accurate view of college and nursing. While an overall scale of the constructs of X, Y, and Z was not supported by factor analyses, item-by-item analysis demonstrated that participants came to realize they may need more support in attending college than previously thought. They also came to see that as a nurse they could live in their community, make enough money to reach financial goals and that nursing was a profession with autonomy, respect, and honor.

Pipeline programs, although imperfect, continue to be a viable option for increasing the number of AINA, African American, and Hispanic students who enter and graduate college, obtain a health professional career, and perhaps become researchers. Diversity occurs by strengthening the entire educational pipeline (Sullivan & Suez Mittman, 2010). Of the many approaches to such programs, some have suggested that STEM and health professions programs focus on the most highly qualified students, such as high school students performing exceptionally well on testing (Johnson & Bozeman, 2012), while others insist that serving those who may test poorly and have lower GPAs is essential (Thompson, Johnson-Jennings & Natizarim, 2013). Programs should be based on the strengths of the community, student, and parents, in addition to offering social and educational experiences and support. This can be accomplished through community engaged comprehensive pipeline programs that reach high school and pre-nursing, or pre-professional students. These students will fill workforce needs and reduce health disparities through the improved health of the individual student and of communities they serve in, be it their home community or the global community. In the long term, improving education for students can affect social determinants of health.

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Highlights

- Research is needed to develop psychometrically sound instruments to measure workforce diversity pipeline programs.
- Psychometric testing of this study's survey revealed that total scores or sub-scale scores cannot assess knowledge and perception changes from pre- to post-program, but can be used to examine changes over time in each item.
- Student's views about college and nursing can be changed with pipeline programs.
- Students attending a residency program came to see nurses as having more power, more respect, and role models more often than previously thought.

Table 1

Sample description N=115

Year attending camp	
First year	72.2%
Second year	24.3%
Third year	2.6%
Fourth year	.9%
Age	16.64 (1.29)
Gender (female)	90.4%
Ethnicity	
American Indian Alaska Native	47.8%
Hispanic	22.6%
Caucasian	12.2%
Pacific Islander	6.1%
African-American	5.2%
Other	.9%
No answer	5.2%
Year in school	
Freshman	13.9%
Sophomore	28.7%
Junior	34.8%
Senior	21.7%
GPA	3.20 (.71)
Classes with highest grades	
Art/music	36.5%
Science	49.6%
English	50.4%
Math	27.0%
Number of family members influencing decision for nursing	3.06 (1.61)

Mean (standard deviation) or percent

Table 2

Model fit for the total scale and subscales

	χ^2 (*df*)	CFI	RMSEA	SRMR
Total scale	930.07 (702)*	.84	.05	.22
College subscale	100.06 (35)*	.57	.13	.23
Work subscale	149.80 (54)*	.70	.12	.21
Nursing subscale	6.94 (9)	1.00	.00	.06
Reasons to be a nurse	14.87 (14)	.99	.02	.11
Reasons not to be a nurse	1.30 (2)	1.00	.00	.07

$p \leq .001$; comparative fit index (CFI); root mean square error of approximation (RMSEA); standardized root mean square residual (SRMR)

Table 3

Students' perceptions of nursing pre- and post-summer program

	Pre-camp	Post-camp	Statistic
Going to College			
I am certain I will go to college	3.90 (4.00)	3.8. (4.00)	22.00
I am academically ready to go to college	3.23 (3.00)	3.19 (3.00)	430.00
I know which classes I have to take before college	3.26 (3.00)	3.29 (3.00)	385.00
I am concerned about getting enough money to go to college	3.10 (3.00)	3.00 (3.00)	499.00
I will be emotionally ready to go to college	3.24 (3.00)	3.14 (3.00)	329.00
I am worried about being away from home	2.20 (2.00)	2.48 (3.00)	1679.00*
I will need emotional support to go to college	2.20 (2.00)	2.75 (3.00)	2088.50*
Problems in my family might keep me from going to college	1.86 (2.00)	1.89 (2.00)	734.50
I need more motivation to go to college	1.71 (2.00)	1.96 (2.00)	912.50*
I need more academic preparation to go to college	2.51 (3.00)	2.65 (3.00)	726.00
Working as a Nurse			
Requires things that do not fit my culture	1.90 (2.00)	1.92 (2.00)	785.00
I would help people	3.81 (4.00)	3.77 (4.00)	175.50
I would use my brain a lot	3.70 (4.00)	3.75 (4.00)	330.00
I can help my people	3.70 (4.00)	3.77 (4.00)	403.00
I could be a leader	3.73 (4.00)	3.62 (4.00)	187.00*
I would make my own decisions	3.33 (3.00)	3.37 (4.00)	693.00
I would be powerful	3.24 (3.00)	3.37 (4.00)	730.50*
I would be respected by others	3.43 (3.00)	3.57 (4.00)	553.00*
I would be equal to doctors	2.84 (3.00)	2.85 (3.00)	764.00
I would be the same as a secretary	2.10 (2.00)	2.05 (2.00)	1017.00
I would be the same as a lawyer	2.11 (2.00)	2.01 (2.00)	653.50
I would be honored by my community or tribe	3.01 (3.00)	3.28 (3.00)	991.00*
I would be a role model for others	3.50 (4.00)	3.63 (4.00)	595.50*
Nurses can:			
Work overseas	3.55 (4.00)	3.63 (4.00)	357.50
Work in community or on reservations	3.63 (4.00)	3.75 (4.00)	308.50*
Work in cities	3.69 (4.00)	3.72 (4.00)	261.00
Work with a variety of patients	3.67 (4.00)	3.76	341.00
Achieve goals like buying a house and car	3.62 (4.00)	3.76 (4.00)	387.50*
Make a lot of money	3.50 (4.00)	3.60 (4.00)	588.00
Important reasons I DO want to be a Nurse:			
I could live where I want	74.8%	85.2%	3.70*

	Pre-camp	Post-camp	Statistic
Nursing is exciting	88.7%	98.3%	6.75*
I would have less responsibility than a doctor	26.1%	31.3%	0.69
I would be respected	80.0%	94.8%	13.47*
I would be important to my community or tribe	82.6%	92.2%	6.67*
I would always be able to get a job	81.7%	87.8%	2.40
Because of the salary	65.2%	60.0%	0.89
Important reasons I DO NOT want to be a Nurse:			
I don't like sick people	8.7%	5.2%	0.90
It would be boring	5.2%	1.7%	1.50
I want to be a doctor	31.3%	22.6%	4.50*
Because of the salary	11.3%	8.7%	0.27
Salary	2.88 (3.00)	3.26 (3.00)	1416.50*

Note. Mean (median); % = percent indicating "yes";

* $p \leq .05$