

Evaluation of a Diversity Intervention Funded by Title VII

Richard D. Muma, PhD, MPH, PA-C; Patricia Pries, MPA, PA-C

Purpose: The purpose of this study was to evaluate an intervention intended to make an impact in heightening the cultural training of health care-focused high school and physician assistant (PA) students, increasing the number of underrepresented minority faculty and preceptors, and increasing the number of minority/disadvantaged applicants and ultimately graduates from the PA program. **Methods:** A parsimonious design was developed to assess program components, including PA student instruction of leading health indicator/career information in low-income high schools; affiliating with a diverse faculty; implementing a PA race-neutral application process; and PA student retention activities. **Results:** The ability of the project to strengthen and expand the cultural training of health care students was demonstrated in the number of participants (high school students [n = 549]; PA students [n = 163]) in the diversity intervention. The scores from the leading health indicator and health care career knowledge tests were above average among high school students. The cultural competency evaluation indicated PA student awareness of health disparities before and after the intervention. Thirty-five percent of each PA class received exposure to underrepresented minority clinicians. The underrepresented and disadvantaged applicant pool increased during the grant project. The number of accepted underrepresented minority matriculates was maintained. **Conclusions:** The project was successful in terms of heightening the training of health care students as measured by the number of participants and their performance on surveys. Exposure of PA students to underrepresented minority faculty was limited. The number of underrepresented minorities increased in the applicant pool; however, the number of underrepresented minorities accepted remained constant.

J Physician Assist Educ 2010;21(4):4-17

Richard D. Muma, PhD, MPH, PA-C, is an associate provost in the Office of Academic Affairs and Research and a professor in the Department of Public Health Sciences, Wichita State University, Wichita, Kansas. **Patricia Pries, MPA, PA-C**, is a physician assistant in Hutchinson, Kansas.

Correspondence should be addressed to:

Richard D. Muma, PhD, MPH, PA-C
Wichita State University
1845 Fairmount
Wichita, Kansas 67260-0043
Telephone: (316) 978-3010
Email: richard.muma@wichita.edu

INTRODUCTION

Diversity in the US population has increased dramatically in the last decade. It is predicted that within the next 50 years, no racial or ethnic group will be the majority due to the large increases expected in minority populations and immigration.¹ However, diversity among health care professionals (and of particular interest in this study, physician assistants) has not kept pace and is not expected to keep pace with diversity in the population. It has been demonstrated that this gap contributes to the lower health care status of minority/disadvantaged populations.² Minority patients cared for by minority providers tend to have better health outcomes.²

Within the health care industry, the physician assistant (PA) profession has a strong history of promoting diversity.^{3,4} This tradition has

been established since the inception of the first PA program at Duke University in 1964. Prentiss Harrison became the first African American PA graduate from Duke in 1968 at a time when many African Americans were struggling to secure basic civil rights.⁵ Since that time, federal funding through the US Comprehensive Health Manpower Training Act (CHMTA) of 1971 made it possible for many other PA programs to become established in the area of recruiting diverse students. The CHMTA was specifically designed to enhance primary care education and distribution as well as to increase the number of underrepresented minorities (including African Americans, Hispanics, American Indian, Alaskan American, Native Hawaiians, Pacific Islanders, and certain Asian groups except Chinese, Filipino, Japanese, Korean, Asian

Indian, or Thai) in the health professions.⁶ Even though the number of practicing PAs has increased, there is a gap in the number of underrepresented minorities in the PA profession (and other health care professions) as compared to the population they serve.⁷ Minority representation in the physician profession is 10%, while minority representation in the PA profession is 12%.^{8,9} This inconsistency is of great concern as mentioned earlier, because as the minority population swells, the subsequent increases in the underrepresented minority representation in health care professions is not predicted to keep pace.⁷

The Office of Disease Prevention and Health Promotion, which is a part of the US Department of Health and Human Services, developed the *Healthy People* framework (HP 2000, 2010, and 2020), which incorporates the nation's Leading Health Indicators. *Healthy People* provides a framework of attainable health goals for the nation. The focus areas of HP 2010 goal two include decreasing mortality rates and morbidity rates and increasing access to health care services.¹⁰ *Healthy People 2010* describes a diverse health care workforce that can help to decrease health disparities by encouraging access and increasing cultural perspectives and understanding.⁷ According to the Institute of Medicines (IOM) Report, *In the Nation's Compelling Interest: Ensuring Diversity in the Health-Care Workforce*, a preponderance of scientific evidence exists supporting the importance of increasing diversity among health professionals.⁷ This evidence demonstrates that greater diversity among health professionals is associated with improved access to care for patients in underserved communities, greater patient choice and satisfaction, better patient-provider communication, and better educational experience for

all students while in training.

As discussed in the IOM report, minority physicians are more likely to practice in underserved areas and have a higher percentage of minority patients than their white colleagues. Black and Hispanic patients reported that they were more likely to choose a physician of their same race because of personal preferences and, for Hispanics, the ability to speak the patient's language.⁷ Patients with racially similar physicians more often reported that they had received preventive services and needed medical care during the previous year.¹¹ For example, in a study of African-American patients adjusting to the effects of vitiligo, patients treated in an outpatient hospital clinic with a predominantly African-American patient population and clinical staff showed better adjustment to their condition than African-American patients who received comparable treatment in a similar clinic with a predominantly white patient population and clinical staff. African-American patients treated in the predominantly African-American clinic were more likely to report that their doctor adequately explained the disease to them compared with African-American patients treated in the predominantly white clinic. In addition, the patients treated in the predominantly African-American clinic reported more satisfaction with levels of trust, comfort, and feeling that the doctor was interested and showed concern.¹¹

More culturally competent care may also influence patient health care-seeking behavior and health care preferences by affecting patient familiarity with and trust in the health care system, thus widening the range of possible acceptable treatment options. The benefits may range from more thorough and accurate documentation of medical histories to greater adherence to treatment

regimens by improving trust, communication, and continuity of care. Finally, the spread of improvements in cultural competence throughout the health care system may expand patient choice and access to a wider range of providers.⁷

In acknowledgement and response to these and other diversity challenges, a midwestern PA program implemented a curriculum based on a Title VII Section 747 grant project to address minority recruitment and retention, which is a US Health Resources and Services Administration (HRSA) priority and outlined in *Healthy People 2010*, goal two (Eliminate Health Disparities).

PURPOSE OF STUDY

The purposes of the study were to analyze data collected for this grant project that spanned 2005–2009 and evaluate the results for the following questions:

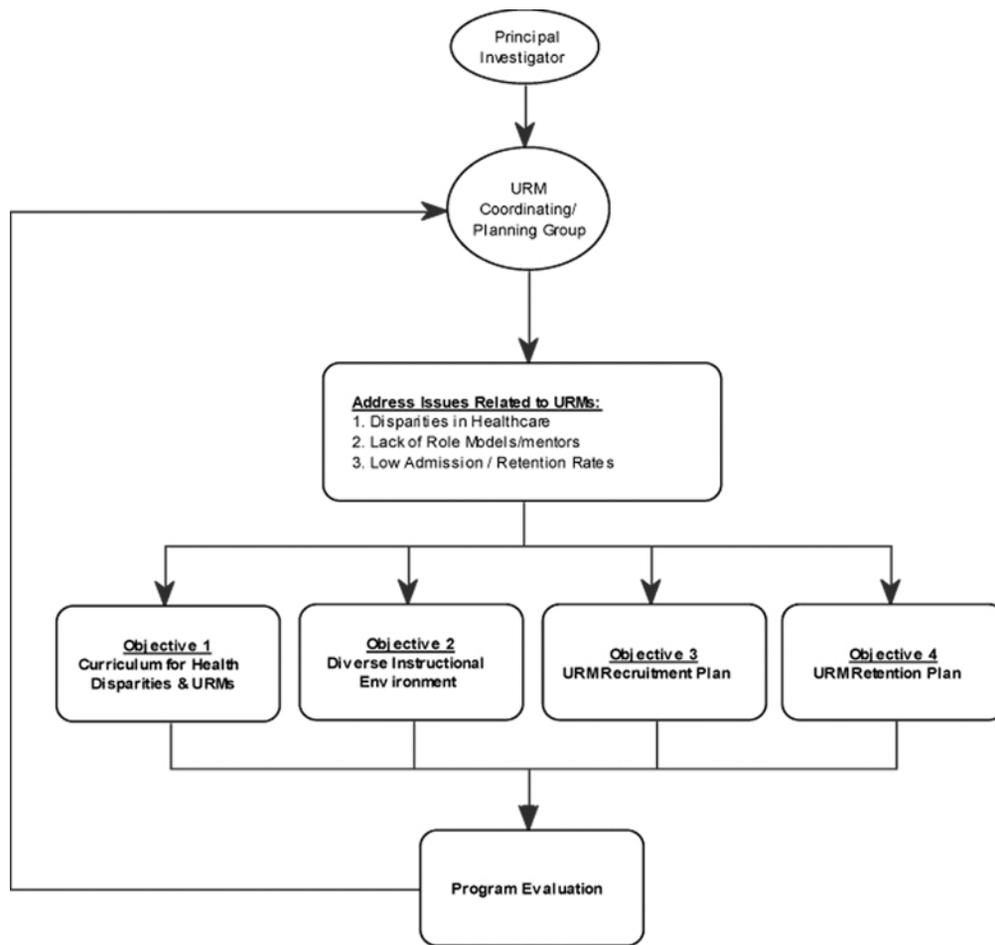
1. How has the grant project strengthened and expanded didactic and clinical curricula to heighten the training of culturally competent students?
2. How has the grant project increased the number of disadvantaged/underrepresented minority faculty who were lecturers, preceptors, and faculty?
3. How has the grant project increased the number of minority and/or disadvantaged applicants to the PA program, and ultimately the graduates who enter the PA workforce?

METHODS

Design

The intervention was conducted out of the Wichita State University PA Program, a midwestern university-based PA program. The program evaluation included both formative

Figure 1. Diversity Workforce Initiative Design



and summative strategies. A parsimonious design was developed to allow assessment of the extent to which the program components were meeting the goals and objectives outlined in the grant. The evaluation examined progress toward both specific and overall program objectives. The objectives were as follows: develop and implement a model curriculum component that focuses on health career information and specific health problems of minorities and other high-risk populations for underserved high school students to encourage entrance into health professions; provide a diverse PA instructional environment that reflects the diversity of the community; implement a plan to increase the

number of minority/disadvantaged applicants and enrollees; and develop and implement a plan to sustain underrepresented minority enrollment and provide for successful program completion (see Figure 1).

Objective One:
Develop a model curriculum component that focuses on health career information and specific health problems of minorities and other high-risk populations for underserved high school students, following guidelines presented in *Healthy People 2010*.

The overall purpose of this objective was to mentor underserved high school students into the health field after graduation. Therefore, a high school curriculum focusing on the

leading health indicators (LHI) outlined in the *Healthy People 2010* objectives was developed and implemented by PA majors (a required peer-led student project) in three local high schools serving underserved populations. Each school had a health care academy and the students enrolled in these academies were the targets of this grant objective. This annual 10-week activity served several purposes, including the delivery of critical health information to a vulnerable group of high school students. But more importantly, the high school students had an opportunity to receive health career information and be mentored by PA majors. The LHI and health care career tests used to measure high school students' knowl-

Figure 2. Health Care Career Knowledge Pretest and Posttest

Name/School: _____ Date: _____

Matching: For questions 1–4, choose the letter that best matches the given career description.

- A. Audiologist
- B. Physical Therapist
- C. Physician Assistant
- D. Registered Nurse
- E. Speech Therapist

___1. Practice medicine under the supervision of physicians and surgeons. They are formally trained to provide diagnostic, therapeutic, and preventive health care services, as delegated by a physician.

___2. Provide services that help restore function, improve mobility, relieve pain, prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They also restore, maintain, and promote overall fitness.

___3. Work with people who have hearing, balance, and related sensory and neural problems.

___4. Assess, diagnose, treat, and help prevent speech, language, cognitive-communication, voice, swallowing, fluency, and other related disorders.

Matching: For questions 5–8, choose the letter that best matches the given career description.

- A. Medical Technologist
- B. Dental Hygienist
- C. Registered Nurse
- D. Health Manager
- E. Physician

___5. Play an important role in the detection, diagnosis, and treatment of disease by performing complex chemical, biological, hematological, immunologic, and microbiological laboratory tests.

___6. Assess patient health problems and needs, develop and implement care plans, and maintain medical records. Administer care to ill, injured, convalescent, or disabled patients. May advise patients on health maintenance and disease prevention or provide case management.

___7. Remove soft and hard deposits from teeth, teach patients how to practice good oral hygiene, and provide other preventive dental care (examine teeth and gums, take dental x-rays, apply cavity preventive agents, etc.)

___8. Manage complex and dynamic health care organizations, and engage in community development initiatives essential to enhancing the health and well-being of humans. Planning, directing, coordinating, and supervising the delivery of health care services are core in this profession.

edge base in this regard can be viewed in Figures 2 and 3. In terms of measuring awareness of health disparities and importance of culturally responsive care among PA students, this was measured by a health belief and attitude survey developed by Crosson, et al (2004) (see Figure 4).¹²

Objective Two:

Provide a diverse instructional environment that reflects the diversity of the community.

This objective was primarily developed to provide an instructional environment for PA students that reflected the diversity of the local community in an effort to increase PA students' awareness regarding the differences of individuals. Efforts were made to recruit underrepresented minorities as instructors and/or preceptors to teach PA students during the didactic and clin-

ical years.

Objective Three:

Develop and implement a minority/disadvantaged student admission plan to increase the number of minority/disadvantaged applicants and enrollees.

Objective Four:

Develop and implement a minority/disadvantaged student retention plan to sustain underrepresented enrollment and provide for successful completion of the program.

These two grant objectives addressed recruitment and retention strategies for the PA program. Objective three was primarily developed to change the way the PA program evaluated applicants. Until grant funding was received, the program primarily evaluated student applications based on GPA and an interview. The grant allowed funding to develop a process in which a series of race-neutral factors were evaluated as proxies for race (see Figure 5). This was done in an effort to increase underrepresented minority and disadvantaged students (defined as African American, Hispanic, Native American/Pacific Islander, American Indian/Alaskan Native, Asians other than Chinese, Filipino, Japanese, Korean, Asian Indian, or Thai; individuals who come from a family with an annual income below a level based on federal low-income thresholds) in the applicant pool, which would hopefully translate into more minorities matriculating, graduating, and entering the PA workforce. An application scoring system was developed with four areas being worth up to 25 points each for a possible total of 100 points: overall GPA, science GPA, health care experience, and race-neutral factors. Objective four addressed the retention of underrepresented minorities enrolled in the program by offering a series of workshops and tutoring activities (eg, in

anatomy) in an effort to retain PA students in general and underrepresented PA students in particular.

Measurement and Data Analysis

Data to assess whether the project answered the evaluation questions were collected from various tracking forms, student and faculty evaluations, and the PA program database. Frequency counts were conducted annually to determine number of participants, student performance on LHI and health care career tests, evaluation of PA student peer teaching, diversity among faculty, minority PA applicants and matriculates, and PA student retention. A chi-square analysis was performed to determine whether there were any significant relationships between the results of a cultural competency evaluation tool among PA students (before and after the intervention, ie, pretest occurred upon entering PA program; posttest occurred just prior to graduation). Data were collected from August of 2005 to May of 2009. Statistical Package for the Social Sciences software, version 17.0, was used for analysis.¹³ The alpha level was set at .05.

RESULTS

Objective One:

Develop and implement a model curriculum component that focuses on health career information and specific health problems of minorities and other high-risk populations for underserved high school students, following guidelines presented in Healthy People 2010.

Through May 2009, 163 PA students participated as developers and deliverers of the high school curriculum in which 549 high schools students participated (see Table 1).

On the LHI knowledge test, 50% of high school students showed an 80% mastery level (see Table 2). Over 95% agreed or strongly agreed that

Figure 3. Healthy People 2010 Leading Health Indicators Pre- and Posttest

Name/School: _____ Date: _____

Instructions: For questions 1–20, choose the best single answer.

1. Since the early 1990s, when our nation last attempted to legislate a guarantee of health care for all, the number of people without health insurance has:
 - A. Increased
 - B. Decreased
 - C. Remained the same
2. Access to health care and quality of health services are greatly influenced by which of the following?
 - A. Cultural and/or religious characteristics
 - B. Language barriers
 - C. Not knowing what to do or when to seek care
 - D. Not having health insurance
 - E. All of the above
3. Alcohol use during pregnancy is known to cause Fetal Alcohol Syndrome?
 - A. True
 - B. False
4. What can long-term drinking lead to?
 - A. Heart disease
 - B. Cancer
 - C. Alcohol-related liver disease
 - D. Pancreatitis
 - E. All of the above
5. Risks associated with unprotected sex include STDs, HIV/AIDS, and unplanned pregnancy. It is also true that not all STDs have symptoms. As a result, how often should sexually active teens see a physician?
 - A. Once a year
 - B. Only when concerned about something
 - C. Once every 5 years
 - D. Once every 3 years
6. Which safe-sex practice is 100% effective in preventing STDs, HIV/AIDS, and unplanned pregnancies?
 - A. The pill
 - B. Diaphragm
 - C. Abstinence
 - D. Condoms
7. What is the leading cause of death in children and adolescents?
 - A. Cancer
 - B. Suicide
 - C. Homicide
 - D. Accidents
8. What are the recommended strategies for reducing violence in schools?
 - A. Make a commitment not to contribute to violence
 - B. Get involved in school and community
 - C. Avoid alcohol and drugs
 - D. Learn nonviolent methods at conflict resolution
 - E. All of the above
9. Vaccines help prevent diseases caused by:
 - A. Bacteria
 - B. Viruses
 - C. Both
10. Vaccine-preventable diseases have been virtually eliminated in the U.S. It is still important to be vaccinated in order to avoid transmission from other parts of the world and to protect those who cannot be vaccinated.
 - A. True
 - B. False
11. Every year smoking kills more people than AIDS, alcohol, drug abuse, automobile accidents, murders, suicides, and fires combined. What is/are some other health problems associated with tobacco use?

(cont'd)

Figure 3. Healthy People 2010 Leading Health Indicators Pre- and Posttest (cont'd)

- A. Heart disease
 - B. Chronic lung disease
 - C. Various cancers
 - D. Two of the above
 - E. All of the above
12. Nicotine is as addictive as heroin and cocaine. What is the best and least painful method for most tobacco users to overcome their addiction?
 - A. Nicotine patches
 - B. Nicotine gum
 - C. Nicotine nasal spray
 - D. Nicotine inhaler
 - E. Cold Turkey
 13. What are some health risks for being overweight and obese?
 - A. High blood pressure
 - B. High cholesterol
 - C. Stroke
 - D. Type II diabetes
 - E. All of the above
 14. The recommended form of dieting for most people involves:
 - A. Choosing sensibly from the 5 major food groups, with an emphasis on whole grains, fruits, and vegetables, accompanied by an effort to moderate fat intake and reduce sugar intake.
 - B. The newest fad diet, including all protein diets
 - C. A crash diet
 - D. Fasting
 15. Which of the following factors plays a central role in health and disease?
 - A. Genetic factors
 - B. Environment
 - C. Personal behavior
 - D. All of the above
 16. Humans are exposed to hazardous agents in the environment that significantly contribute to illness, disability, and death. Exposure can occur through;
 - A. Air
 - B. Water
 - C. Soil
 - D. Food
 - E. All of the above
 17. Mental disorders are health conditions that are characterized by changes in thinking, mood, or behavior that are associated with distress and/or impaired functioning. Ultimately, mental disorders can lead to disability, severe pain, and/or death.
 - A. True
 - B. False
 18. What is/are the primary factors that influence the development of mental illnesses?
 - A. Biological factors
 - B. Psychological factors
 - C. Social/environmental factors
 - D. All of the above
 19. Which of the following is a benefit of regular physical activity?
 - A. Decreased blood pressure
 - B. Decreased risk of colon cancer
 - C. Decreased risk of stroke
 - D. Increased psychological well being/ decreased stress
 - E. All of the above
 20. Nearly 1/2 of adolescents and young adults in Kansas are physically inactive and fail to meet the minimum recommended level of activity. What is the minimum recommended level of physical activity for this age group?
 - A. Moderate intensity at 30 minutes/day for 5 or more days/week
 - B. Vigorous intensity at 20–60 minute sessions for 3 or more days/week
 - C. Any intensity at 10 minutes/day for 2 days/week
 - D. All of the above
 - E. A&B only

the presentations by PA students were good overall, and that they gained basic knowledge of the material (see Table 3). Many students commented on the quality of the presentations by saying that they were “fantastic.” Others enjoyed and appreciated the PA students teaching at their schools and wanted them to return in the future.

On the health care career (HCC) knowledge test, high school students performed above average. Seventy-six percent of students showed a 75% mastery level of the content; 50% of students scored 80% or better (mean = 74.2%; median = 87.5%; mode = 88%) for the second year of the grant. For the third year of the grant pre- and post- HCC knowledge tests were administered. A slight increase occurred in the percentage of students passing the test from pre to post (83% to 90%). Sixty-three percent of students showed an 80% mastery level of the content and scored at least 80% or better on the HCC test (see Table 4).

In terms of measuring awareness of health disparities and the importance of culturally responsive care among PA students, two PA classes have been evaluated. The results indicate overall student awareness of health disparities and the importance of culturally responsive health care prior to the exposure to the diversity intervention and continued awareness thereafter. One item on the cultural competency evaluation form for the PA class of 2007 demonstrated a significantly different relationship from the pretest to the posttest.

The statement was that PAs can give excellent health care without knowing patients’ understanding of their illness. The students predominantly disagreed with this statement on the pretest, but agreed after taking the cultural competency component and completing their PA education.

Figure 4. Cultural Competency Evaluation Form

Instructions: The following survey was developed to assess cultural competence of PA students. Please answer every question to the best of your knowledge using this survey. There are no right or wrong answers. Results of this survey will likely assist those interested in learning more about PA student cultural competence in general. No identifying marks will be included on the survey. This process will likely eliminate harm to you, protect your privacy, and prevent discrimination of any kind. You will not incur any personal expense, other than time, in connection with this research project. All data will be kept in a locked file cabinet. This survey has been approved by the University IRB. The approximate time to complete the survey is 5 minutes.

DEMOGRAPHIC INFORMATION	RACE	AGE	GENDER		CLASS YEAR
	<input type="checkbox"/> African American <input type="checkbox"/> American Indian <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> Asian Subpopulation <input type="checkbox"/> Alaskan Native <input type="checkbox"/> Caucasian <input type="checkbox"/> Hispanic <input type="checkbox"/> Other:		<input type="checkbox"/> Male <input type="checkbox"/> Female		

ITEM (Please mark your response in the right-hand columns for each question)	Strongly AGREE		AGREE		DISAGREE		Strongly DISAGREE	
	1	2	3	4	5	6		
1. PAs should ask patients for their opinions about their illnesses.								
2. It is important to know patients' point of view for the purpose of diagnosis.								
3. Patients may lose confidence in PA if PA asks their opinion about their illness or problem.								
4. Understanding patients' opinions about their illnesses helps PAs reach correct diagnosis.								
5. PAs can give excellent care without knowing patients' opinions on their illnesses or problems.								
6. Understanding patients' opinions about their illnesses helps PAs provide better care.								
7. PAs can give excellent health care without knowing patients' understanding of their illness.								
8. PAs should ask their patients what they believe is the cause of their illness.								
9. PAs should learn about their patients' cultural perspective.								
10. PAs can learn from their patients' perspectives on their illnesses.								
11. PAs should ask their patients why they think their illness has occurred.								
12. PAs should ask about how an illness is impacting a patient's life.								
13. PAs should make empathetic statements about their patients' illnesses.								
14. PAs should ask patients for their feelings about their illnesses.								
15. PAs do not need to ask about patients' personal lives or relationships to provide good health care.								

Data from the PA class of 2008 overall indicate congruent attitudes between the pretest and posttest results. However, there was less agreement on whether PAs should ask their patients about the cause of their illness, whether they can learn from their patients' perspective on their illness, and whether they should ask

their patients how they feel about their illness; and less disagreement on whether they should ask about their patients' personal lives in an effort to provide good health care (see Tables 5 and 6).

Objective Two:
Provide a diverse instructional environment that

reflects the diversity of the community.

Regarding the diversity of the faculty, 11.3% of preceptors and 11.7% of guest instructors in the PA program were considered underrepresented minorities. However, 35% (considered baseline) of the PA class of 2006 received exposure to other underrep-

resented minority clinicians during the second year of their program (year one of the grant); 38% of the PA class of 2007 received exposure to underrepresented minority didactic clinicians during the first year of the program, and 35% received exposure to underrepresented minority clinicians during the second year of the program (year two of the grant). Sixty-three percent of the PA class of 2008 (year three of the grant) received exposure to underrepresented minority clinicians during the first year of the program. In addition, time spent by PA students with underrepresented minority clients was documented. This was measured by the number of hours spent in the clinics. For the PA class of 2007, 25% of the class spent, on average, about 20 hours (considered baseline), and for the class of 2008, 71% spent, on average, about 73 hours with underrepresented minority clients (see Tables 7–9).

Objective Three:

Develop and implement a minority/disadvantaged student admission plan to increase the number of minority/disadvantaged applicants and enrollees.

Outcomes for this objective indicate that in year one of the grant (2006) 8% (seven students) of the qualified applicant pool were classified as underrepresented minorities; grant year two, 8% (10 students); grant year three, 12% (14 students); and the two years beyond the grant, 10% (17 students) and 14% (24 students) of the qualified applicant pool were classified as underrepresented minorities (see Table 10).

Five (12%) underrepresented minority students were admitted in year one of the grant; six (14%) underrepresented minorities in year two; two (5%) underrepresented minorities and four (10%) financially

disadvantaged students in year three; and one (2.0%) underrepresented minority and 12 (28%) financially disadvantaged in the first year beyond the grant. During the second year beyond the grant, there were five (11%) underrepresented minorities and four (8.5%) financially disadvantaged admitted (see Table 11).

Objective Four:

Develop and implement a minority/disadvantaged student retention plan to sustain underrepresented minority enrollment and provide for successful completion of the program.

Objective four addressed the retention of underrepresented minorities enrolled in the program. Zero percent attrition of underrepresented minorities occurred until the class of 2010 (see Table 12).

DISCUSSION

Summary of Results Compared to the Literature

This research project evaluated how a diversity intervention in a midwestern PA program attempted to heighten the cultural training of health care students, how it may have impacted the number of underrepresented minority/disadvantaged faculty, guest lecturers and preceptors, and how it may have impacted the number of underrepresented minority/disadvantaged PA applicants to the PA program, and ultimately the PA graduates who enter the PA workforce. Whether or not the intervention in this project directly attributed to the changes measured, the number of underrepresented minority and disadvantaged students in the applicant pool increased after changes in application procedures were made.¹⁴ Determining a cause and effect relationship is difficult as there are many confounding factors that play into interventions of this type (eg, changes among admission committee membership, changes in the local minority pop-

ulation). However, this finding compares favorably to various HRSA Title VII funded grant initiatives in which diversity interventions are aimed at maintaining or increasing minority matriculates. For example, the University of Texas Southwestern PA program targeted recruitment efforts at historically black colleges and over a 5-year period increased URM/disadvantaged students from 8.3% to 38.9%.¹⁵ The success of our project in this area may be attributed to its new application process; using proxies for race.

Although issues of racial disparity in relation to providers and patients exist in every community in the United States,¹⁶ population centers with less diversity, such as the case in this project, may struggle with lackadaisical attitudes among health care leaders in charge of health care training programs. For whatever reason, it may appear that racial disparities with providers and patients are not viewed as important in these population centers. However, this project illustrates (although not spectacular in its outcomes) how racial provider and patient disparities can be addressed (and in some cases, improved) in such a population center.

The ability of the project to strengthen and expand the cultural training of health care students was demonstrated in the sheer number of participants to the diversity intervention. The LHI knowledge test indicated high school students performed well, and the students evaluated the teaching of PA students as favorable. Although diversity among the core PA faculty remained low, a minimum of 35% of each PA class received exposure to underrepresented minority clinicians in the clinical setting. Analysis for two full PA classes indicated student awareness of health disparities and the importance of culturally responsive health care prior to the exposure to the diversity intervention and continued awareness after the intervention. However, these results

should be viewed with some caution as some of the chi-square cells had counts of less than five responses. Nevertheless, these outcomes were congruent with other research identified in the IOM report, *In the Nation's Compelling Interest*.⁷

A long-term effect of this intervention may be that the high school students who participated in the curriculum will be eligible to apply to the PA program in 3 to 5 years, possibly increasing diversity in the program. It is encouraging to see an increase in PA underrepresented minority/disadvantaged applicants in the years beyond the grant program.

Overall Significance of the Study Findings

The significance of this study is inherent in its desire to address the present and future discrepancies among health care workers in terms of their ethnic/racial/social representation. The design of the program provides opportunities to fine tune the intervention to continue increasing diversity and cultural competence among health care students at this midwestern university and conceivably could serve as a model (eg, the tools developed for the intervention are available) for other health care programs that are striving to attain similar goals.

ACKNOWLEDGEMENT

This project was supported in part by the Workforce Diversity Initiative Grant, funded by US/DHHS, grant number D57HP05123, 2005–2011, Dr. Richard Muma, PI.

REFERENCES

1. US Census Bureau. American Fact Finder. http://factfinder.census.gov/jsp/saff/SAFFInfo.jsp?_pageId=tp9_race_ethnicity. Accessed October 15, 2009.
2. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce. *Health Aff.* 2002;21:90-102.
3. Jacques PF. Cultural competency curriculum: components for inclusion in

Figure 5. Proxies for Race

Do you perceive yourself as financially disadvantaged? Yes <input type="checkbox"/> No <input type="checkbox"/>	Persons in Family ¹	Income Level ²
If yes, mark the box that fits your income level.	<input type="checkbox"/> 1.....	10,210
	<input type="checkbox"/> 2.....	13,690
	<input type="checkbox"/> 3.....	17,170
	<input type="checkbox"/> 4.....	20,650
	<input type="checkbox"/> 5.....	24,130
	<input type="checkbox"/> 6.....	27,610

¹Includes only dependents reported on Federal Income tax forms for calendar year ____

²Adjusted gross income for calendar year ____

²(for example only)

Please circle the appropriate answer for the following questions.

1. What is the size of the community where you spent the major portion of your high school years (more than 1 year)? (Circle One)
 - a. Large city (population 500,000 or more)
 - b. Suburb of a large city
 - c. City of moderate size (population 50,000 to 499,999)
 - d. Suburb of moderate size city
 - e. Small city (population 10,000–49,999 - other than suburb)
 - f. Town (population 2,500–9,999 - other than suburb)
 - g. Small town (population less than 2,500)
 - h. Rural/unincorporated area
2. What is the size of your current residence's community (the residence you have called "home" for more than 1 year)? (Circle One)
 - a. Large city (population 500,000 or more)
 - b. Suburb of a large city
 - c. City of moderate size (population 50,000 to 499,999)
 - d. Suburb of moderate size city
 - e. Small city (population 10,000–49,999 - other than suburb)
 - f. Town (population 2,500–9,999 - other than suburb)
 - g. Small town (population less than 2,500)
 - h. Rural/unincorporated area
3. Are you the first person in your immediate family (ie, parents, siblings) to attend college?
 - a. Yes
 - b. No
4. What is your present preference concerning the medical specialty in which you would like to practice after program completion? (Circle One)
 - a. Anesthesiology
 - b. Dermatology
 - c. Emergency medicine
 - d. Family practice
 - e. Geriatrics
 - f. General Internal medicine
 - g. Neurology
 - h. Obstetrics-gynecology
 - i. Ophthalmology
 - j. Orthopaedics
 - k. Otolaryngology
 - l. Pediatrics
 - m. Physical medicine – rehab
 - n. Public health-preventive med
 - o. Psychiatry
 - p. Surgery
 - q. Other _____
5. In which of the following settings would you most like to practice following training as a physician assistant? (Circle One)
 - a. Large city (population 500,000 or more)
 - b. Suburb of a large city
 - c. City of moderate size (population 50,000 to 499,999)
 - d. Suburb of moderate size city
 - e. Small city (population 10,000–49,999 - other than suburb)
 - f. Town (population 2,500–9,999 - other than suburb)
 - g. Small town (population less than 2,500)
 - h. Rural/unincorporated area

(cont'd)

Figure 5. Proxies for Race (cont'd)

6. Are you fluent in:
 Spanish¹ a. Yes (If yes, specify language _____) b. No
 Asian Language*² a. Yes (If yes, specify language _____) b. No

¹Must provide verification, which must include verification from a foreign language fluency testing service (such as Language Testing International, <http://www.language-testing.com/>), a college/university international office official, or a college/university foreign language faculty member. The verification must attest to your fluency in the language specified above.

²Only Asian languages spoken in Cambodia and Vietnam, not languages spoken in China, Philippine Islands, Japan, Korea, India, Malaysia, Pakistan or Thailand.

7. If you desire, on a separate sheet of paper, please provide a one-page (maximum) narrative that describes your significant leadership activities (must be typewritten, double-spaced, 12-point font, 1-inch margins, on white paper).
8. If you desire, on a separate sheet of paper, please provide a one-page (maximum) narrative that describes your significant service to underserved communities (must be typewritten, double-spaced, 12-point font, 1-inch margins, on white paper).

Table 1. PA Majors, Pre-PA Majors, and High School Student Participants

Year	PA Majors	High School Students
Grant year 1	42 (Class of 2007)	140
Grant year 2	39 (Class of 2008)	192
Grant year 3	82 (Class of 2009/2010)	217

Table 2. High School Student Performance on the Leading Health Indicator Knowledge Test (n = 549)

Year	Mean	Median	Mode
Grant year 1	*	*	*
Grant year 2	72%	77%	85%
Grant year 3	79%	80%	95%

*LHI not gathered until second year of grant.

Table 3. Evaluation of PA Teaching of LHI Curriculum to High School Students (Grant Year 2 and 3 Aggregate High School Data Reported) (n = 549)

Year	Presentation by PA Students Overall Good	Gained Basic Knowledge of LHI Material Agreed or Strongly Agreed
Grant year 2	95.5%	95.5%
Grant year 3	95.5%	95.5%

Table 4. High School Student Performance on the Health Care Career Knowledge Test (n = 549)

Year	Mean	Median	Mode
Grant year 1	*	*	*
Grant year 2	74.2%	87.5%	88%
Grant year 3	85.0%	87.5%	87.5%

*Data not collected until second year of grant.

physician assistant education. *Perspect Physician Assist Educ.* 2004;15(2):102-105.

- Strand J, Carter R. Primary care training grants through Title VII, section 747: the Duke experience. *Perspect Physician Assist Educ.* 2003;14(1):25-30.
- Physician Assistant History Center. Audiotape Collection. <http://www.pahx.org/audiotapes.htm>. Accessed October 15, 2009.
- Hooker RS, Cawley JF. *Physician Assistants in American Medicine*. 2nd ed. St. Louis, MO: Churchill Livingstone; 2003.
- Institute of Medicine. *In the Nation's Compelling Interest: Ensuring Diversity in the Health-Care Workforce*. Washington DC: The National Academies Press. 2004. http://www.nap.edu/catalog.php?record_id=10885#toc. Accessed October 15, 2009.
- Association of American Medical Colleges. Diversity in the Physician Assistant Workforce: Facts & Figures 2006. 2006:126.
- AAPA: AAPA Physician Assistant Census Report. 2009.
- Healthy People 2010*. Leading Health Indicators. www.healthypeople.gov. Accessed October 15, 2009.
- Nickens HW. The right thing to do, the smart thing to do: enhancing diversity in the health professions: summary of the Symposium on Diversity in Health Professions in honor of Herbert W. Nickens, MD. Washington, DC: National Academies Press Institute of Medicine; 2001.
- Crosson JC, Deng W, Brazeau C, Boyd L, Soto-Greene M. Evaluating the effect of cultural competency training on medical student attitudes. *Fam Med.* 2004;36(3):199-203.
- SPSS. Version 17.0. Chicago, IL: SPSS;2008.
- Badura D, Ramos V, Muma RD. Evaluation of a physician assistant student admission plan that considers race neutral factors. *Final Program: 2007 PAEA Annual Education Forum*. Alexandria, VA: Physician Assistant Education Association; 2007.
- Orcutt VL, Jones PE. Title VII Success at University of Texas Southwestern. *Perspect Physician Assist Educ.* 2003;14(4):240-241.
- Mulitalo KE, Straker H. Diversity in physician assistant education. *J Physician Assist Educ.* 2007;18(3):46-51.

Evaluation of a Diversity Intervention Funded by Title VII

Table 5. Perceptions of Physician Assistant Students' Cultural Competency % (PA Class of 2007)

Item	Strongly Agree 1	Agree 2	3	4	Disagree 5	Strongly Disagree 6	χ^2
Patient opinions about illness							1.296
Pretest	50.0	42.5	7.5	—	—	—	
Posttest	38.1	54.8	7.1	—	—	—	
Patient view of diagnosis							3.372
Pretest	32.5	47.5	10.0	7.5	2.5	—	
Posttest	33.3	57.1	2.4	7.1	—	—	
Patient confidence in PA							4.767
Pretest	—	5.0	25.0	50.0	7.5	12.5	
Posttest	—	11.9	21.4	57.1	—	9.5	
Patient opinion impact on PA and correct diagnosis							5.244
Pretest	10.0	52.5	27.5	5.0	5.0	—	
Posttest	14.3	35.7	42.9	7.1	—	—	
Excellent care							12.206
Pretest	—	15.0	27.5	35.0	17.5	5.0	
Posttest	2.4	33.3	2.4	23.8	33.3	4.8	
Better care							0.094
Pretest	32.5	55.0	10.0	2.5	—	—	
Posttest	35.7	52.4	9.5	2.4	—	—	
Understand illness							12.714*
Pretest	2.5	15.0	12.5	45.0	10.0	15.0	
Posttest	—	33.3	31.0	28.6	2.4	4.8	
Patient belief							2.600
Pretest	27.5	50.0	15.0	5.0	2.5	—	
Posttest	23.8	47.6	2.4	21.4	4.8	—	
Patient culture							4.865
Pretest	57.5	37.5	5.0	—	—	—	
Posttest	47.6	33.3	2.4	9.5	7.1	—	
Patient perspective							0.881
Pretest	22.5	60.0	17.5	—	—	—	
Posttest	26.2	50.0	23.8	—	—	—	
Why illness							2.829
Pretest	22.5	52.5	22.5	2.5	—	—	
Posttest	26.2	38.1	26.2	9.5	—	—	
Illness impact							1.502
Pretest	62.5	35.0	2.5	—	—	—	
Posttest	54.8	38.1	4.8	2.4	—	—	
Empathy statement							2.511
Pretest	37.5	50.0	10.0	2.5	—	—	
Posttest	47.6	38.1	14.3	—	—	—	
Patient feelings							1.342
Pretest	35.0	52.5	12.5	—	—	—	
Posttest	40.5	45.2	11.9	2.4	—	—	
Patient personal							7.326
Pretest	—	2.5	10.0	22.5	27.5	37.5	
Posttest	—	7.1	14.3	42.9	14.3	21.4	

*df = 5, $p < .05$

Evaluation of a Diversity Intervention Funded by Title VII

Table 6. Perceptions of Physician Assistant Students' Cultural Competency % (PA Class of 2008)

Item	Strongly Agree 1	Agree 2	3	4	Disagree 5	Strongly Disagree 6	χ^2
Patient opinions about illness							2.082
Pretest	57.5	40.0	2.5	—	—	—	
Posttest	44.4	42.5	7.5	—	—	—	
Patient view of diagnosis							5.395
Pretest	42.5	40.0	7.5	5.0	2.5	2.5	
Posttest	30.6	41.7	22.2	5.6	—	—	
Patient confidence in PA							1.295
Pretest	2.5	12.5	12.5	37.5	27.5	7.5	
Posttest	—	11.1	11.1	44.4	27.8	5.6	
Patient opinion impact on PA and correct diagnosis							7.323
Pretest	15.0	47.5	12.5	15.0	5.0	5.0	
Posttest	14.3	34.3	28.6	22.9	—	—	
Excellent care							4.277
Pretest	7.5	15.0	27.5	25.0	22.5	2.5	
Posttest	5.7	17.1	31.4	37.1	8.6	—	
Better care							2.646
Pretest	42.5	45.0	5.0	2.5	2.5	2.5	
Posttest	38.9	41.7	13.9	2.8	2.8	—	
Understand illness							8.622
Pretest	12.5	7.5	30.0	30.0	10.0	10.0	
Posttest	2.9	22.9	20.0	31.4	20.0	2.9	
Patient belief							9.679*
Pretest	50.0	37.5	10.0	2.5	—	—	
Posttest	19.4	44.4	27.8	8.3	—	—	
Patient culture							4.443
Pretest	65.0	27.5	7.5	—	—	—	
Posttest	41.7	50.0	8.3	—	—	—	
Patient perspective							6.792**
Pretest	45.0	50.0	5.0	—	—	—	
Posttest	27.8	47.2	25.0	—	—	—	
Why illness							8.939
Pretest	47.5	35.0	12.5	5.0	—	—	
Posttest	22.2	50.0	25.0	—	25.0	2.8	
Illness impact							7.677
Pretest	82.5	15.0	2.5	—	—	—	
Posttest	58.3	38.9	—	2.8	—	—	
Empathy statement							2.339
Pretest	65.0	30.0	5.0	—	—	—	
Posttest	48.6	37.1	14.3	—	—	—	
Patient feelings							8.893*
Pretest	60.0	32.5	7.5	—	—	—	
Posttest	27.8	61.1	8.3	2.8	—	—	
Patient personal							14.124†
Pretest	—	—	2.5	20.0	17.5	60.0	
Posttest	—	5.6	16.7	30.6	25.0	22.2	

*df = 3 $p < .05$ **df = 2, $p < .05$ †df = 0, $p < .01$

Table 7. Diversity Among Faculty

Grant Year	Preceptor	Guest Instructor	Faculty
1	11 (11.3%)	7 (11.7%)	1 (6.3%)
2	11 (11.3%)	7 (11.7%)	1 (6.3%)
3	11 (11.3%)	7 (11.7%)	0 (0.0%)

Table 8. Percentage of Class That Received Exposure to URM Role Models

Grant Year	PA Students 2006	PA Students 2007	PA Students 2008
1	35% 2nd year	38% 1st year	*
2	*	35% 2nd year	*
3			63% 1st year

*Data not collected

Table 9. Hands-on Exposure of PA Majors to Leading Health Indicators as They Were Manifested in Diverse Populations

	PA Students 2006	PA Students 2007	PA Students 2008
Percent of students	*	25%	71%
Total hours/each	*	19.8 hours	72.6 hours

*Data not elicited until third year of grant

Table 10. Applicants (by Class)

	2005	2006 [†]	2007	2008	2009	2010
Applicants	134	88	122	114	175	176
URM applicants	17 (13%)	7 (8%)	10 (8%)	14 (12%)	17 (10%)	24 (14%)
Financially disadvantaged	*	*	*	23 (20%)	24 (14%)	24 (14%)

*Data not collected until class of 2008

[†]New race neutral admission policies instituted

Table 11. Admitted Students (by Class)

	2005	2006 [†]	2007	2008	2009	2010
URM	7 (15%)	5 (12%)	6 (14%)	2 (5%)	1 (2%)	5 (11%)
Financially disadvantaged	*	*	*	4 (10%)	12 (28%)	4 (10%)
Accepted Applicants	47	42	42	42	43	47

*Data not elicited until class of 2008

[†]New race neutral admission policies instituted

Table 12. Student Attrition Data (by Class)

	2005	2006	2007	2008	2009	2010
Beginning program	47	42	42	42	43	47
Graduating program	41	40	42	39	42	42 [†]
Overall attrition	6 (13%)	2 (5%)	0 (0%)	3 (7%)	1 (2%)	5 (11%)
Underrepresented minority/ disadvantaged attrition	0%	0%	0%	0%	0%	2 (4%)