

PREVALENCE OF HEALTH PROFESSIONAL STUDENTS AT A MIDWESTERN
COLLEGE OF HEALTH PROFESSIONS WHO ATTENDED A HIGH SCHOOL
BIOMEDICAL PROGRAM

A Research Project by

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and the faculty of the Graduate School of Wichita State University
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the requirements of the degree of
Master of Physician Assistant

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I hereby recommend that the research project prepared under my supervision by Kameshni Dennill entitled Prevalence of health professional students at a Midwestern College of Health Professions who attended a high school biomedical program be accepted as partial fulfillment for the degree of Master of Physician Assistant.

Approved:



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TABLE OF CONTENTS

| | Page |
|--|------|
| ABSTRACT | 1 |
| INTRODUCTION | 2 |
| METHODOLOGY | |
| Design and Measurement | 6 |
| Subject and Data Analysis | 7 |
| RESULTS AND DATA ANALYSIS | |
| Demographic profile | 7 |
| Research questions | 9 |
| DISCUSSION | |
| Summary of results as compared to literature | 11 |
| Overall significance of the study findings and opportunities for future research | 13 |
| Conclusion | 13 |
| LIST OF REFEEERENCES | 15 |
| APPENDIX | |
| A. Survey | 16 |
| VITA | 19 |

LIST OF TABLES

| Tables | Page |
|---|------|
| 1. Respondents Characteristics | 8 |
| 2. Respondents High School States | 9 |
| 3. Perceptions Ratings on Biomedical Programs | 10 |

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Abstract

Introduction: To address the shortage of healthcare professionals nationwide, high schools across the nation have introduced biomedical programs into their curriculum to draw students into the health career track; in particular minority and underrepresented students who represent a large untapped resource of potentially eligible healthcare students. In order to determine the magnitude of such programs in Kansas, 1,358 individuals were surveyed who were either current or past healthcare students in a Midwestern college of health professions. *Methodology:* A 16 question survey, collected respondents' demographic information, whether they participated in a high school biomedical program, and their perceptions of the program (if a participant). If appropriate the respondents were also asked to rate their biomedical program in terms of curriculum, healthcare insight gained, clinical experience, and student counseling. *Results:* The survey response rate was 17.7% (n=241). Only 7% (n=18) of the respondents participated in a high school biomedical program. Of those students who participated in a biomedical program, 94% went on to major in healthcare during college. Demographically, the majority (89.2%) of respondents were White and (86.3%) were female with little representation of minority and underrepresented students. *Conclusion:* Overall it appears that only a small percent of the pre-professional and professional healthcare students at a Midwestern college of health professions attended a biomedical program in high school; however, those who did found the programs to be beneficial in preparing them for a career in healthcare.

INTRODUCTION

The healthcare shortage and the increasing demands on the healthcare system have amplified the urgency for universities and colleges nationwide to recruit students into the health profession. Identified over 30 years ago; this crisis has given rise to a series of interventions and educational programs nationwide which are working towards increasing students interests in healthcare, familiarizing students with health careers, providing them with the support to overcome educational limitations, and providing students with career counseling and assistance with university applications.¹ High schools have introduced biomedical programs into their curriculum with the goal to increase the pool of high school graduates and pre-professional students eligible for entrance into college level health professional programs. But despite these nationwide efforts, there still appears to be a decline in the applicant-acceptance ratio, decline in enrollment and decline in the number of graduates from health professions colleges and medical schools.² The evidence has shown that there are multifaceted reasons why well qualified high school students and pre- professional students fail to matriculate into and graduate from health professions colleges and transition into healthcare professionals. Reasons include everything from lack of family support, lack of role models, financial constraints, social and racial disparities, to the attraction of other occupations that offer the same salary scales without requiring 4 years and more of college work.²⁻⁴

Literature Review

A literature search was conducted through Cochrane, ERIC, and Medline databases using the following key terms: recruiting, high school students, healthcare professions, education, biomedical programs, bioscience programs and healthcare shortage. The literature demonstrated that with the realization that the general workforce draws candidates from the same limited pool

of eligible high school graduates and college freshman; the healthcare profession saw a need for innovative recruiting methods which targeted students while in still in high school and undecided on a career. In light of this, high school students were surveyed to develop recruitment strategies aimed at that population. One survey conducted included a sample of 505 high school seniors from three schools in the public school system of Richmond County in Augusta, Georgia. The high school students were eligible for acceptance into several programs at the Medical College of Georgia. The students were asked among other questions, what careers they intended to pursue, and about their familiarity with and impressions of the allied health professions. Although 76.5% of the respondents had a favorable impression of allied health, only 15% indicated that they were familiar with the allied health professions.⁵ This study revealed that it was the lack of knowledge rather than the lack of interest that deterred students from pursuing careers in healthcare. Similar studies in different areas of the country showed this to be the trend and to address this problem high school curricula were revised to include biomedical and science programs.^{1, 3, 6-8}

High school biomedical programs were designed to provide high school students intent on a healthcare career with a health related educational curriculum, opportunities for healthcare exposure through clinical rotations at local clinics and hospitals and direct contact with allied health faculty and career counseling. Assessment and follow up studies of some biomedical programs have shown that the programs have done a remarkable job of recruiting students, strengthening their academic skills and providing them with exposure to the various allied healthcare careers. In a study of graduates from the High School for Health Professions (HSHP) in Houston, Texas, 2,033 students were surveyed and 46.8% usable responses were collected. Over 92% of the HSHP students who responded to the survey reported attending college and

over 75% of them reported majoring in a health or science discipline.⁷ Furthermore, all of the students with health or science majors surveyed reported that the biomedical program played a vital role in encouraging and assisting them with access to health education and clinical exposure.

Another important reflection for the healthcare profession in their innovative recruiting strategy was the disparity between the percentage of minority and underrepresented healthcare professionals relative to the minority and underrepresented population as a whole.^{1,3} In response, a national Health Professions Partnerships Initiative (HPPI) was started to address the issue of under representation of minority groups in the healthcare professions. Funded by the Robert Wood Johnson Foundation and the W.K. Kellogg Foundation, the HPPI encouraged the formation of partnerships between health professions schools, undergraduate colleges, several public schools in one school district and one or more organizations within that community to increase the number of African Americans, Hispanics, and Native Americans in healthcare professions. Substantial grants were given to all partners with the intent to enhance professional development of teachers, improve curricula, provide enrichment programs in health, math and science, career counseling, and support of career aspirations.¹

Minority and underrepresented students represent a large untapped resource of potentially eligible healthcare students. In addition, the importance of diversifying the healthcare workplace was well documented by Smedley wherein scientific evidence demonstrates that greater diversity among health professionals is coupled with improved access to healthcare for racial and ethnic minority patients which in turn provides better educational experiences for all healthcare students while in training.⁹

Another well documented problem with recruiting students into healthcare professions is that students are not exposed to healthcare career options early enough, which in some cases should be started as early as middle school.^{6,8} In one study the benefits of earlier exposure were unclear for a survey of gifted underrepresented minority students who entered the pipeline to healthcare while in high school, but upon graduation, did not pursue a career in healthcare. They stated that upon graduation their interests in non-medical careers had been fostered by mentors and opportunities for internship and subsequent employment.⁴ This study identified graduation of high school as the more crucial point to retain students in the health career path compared to earlier exposure of students to health career options.

The necessity of increasing the number of minority and underrepresented students in the healthcare professions cannot be disputed since scientific evidence demonstrates that a diverse healthcare workforce benefits communities in terms of improved access to care for minority patients, greater patient choice and satisfaction, and better patient- clinician communication.⁹ While it is common knowledge that appropriate high school education is critical in preparing minority and underrepresented students for a career in healthcare, to increase the number of underrepresented students granted admission to health profession colleges, it is recommended that such colleges rethink their admissions policies and practices. Some argue that greater weight should be placed on qualitative attributes such as commitment to service, community orientation, experience with diverse groups, leadership skills and other “humanistic” factors and less emphasis on quantitative variables like standardized tests including SAT and GRE, in which for a variety of reasons, minority and underrepresented students score lower than their white peers.⁹

Purpose of Study

To ascertain the current state of health profession students in a Midwestern university who had attended a biomedical program during high school, a cross-sectional study was designed. This pilot study was designed to investigate the prevalence of pre-professional and professional healthcare students who attended a biomedical program during high school and highlight factors that influenced them in their decision to pursue a career in healthcare. Specifically, the survey evaluated what role the biomedical programs played in that decision in terms of academically preparing, fostering and supporting them in their pursuit of different healthcare careers. To accomplish this, pre-professional health and health major (current and past) students at Wichita State University were surveyed and asked a series of questions to answer the following research questions:

Question 1: What was the prevalence of pre-professional and professional students who attended a biomedical program during high school?

Question 2: What were the characteristics of these biomedical programs in terms of preparations of students entering a healthcare field?

METHODOLOGY

Design and Measurement

This study was designed to investigate the prevalence of pre-professional health and health major (current or former) students at a Midwestern college of health professions who attended select biomedical programs (also known as a health career track or emphasis) during their high school years. A 16 question survey was mailed to a total of 1,358 current healthcare students who were enrolled in or were recent graduates of the college of health professions to ascertain whether they participated in a biomedical program during high school. In section one, students were asked basic demographic information including which high school they attended,

whether they were enrolled in a biomedical program in high school and their current student status at the college. In section two, those students who were enrolled in a biomedical program were asked to indicate the reason for their healthcare career choice and if the biomedical programs enhanced their career pursuits. Through a series of Likert scale questions (ranging from “strongly agree” to “strongly disagree”) they were asked to comment on the programs curriculum and the insight it provided them. These questions included what degree of community based healthcare experience they gained as part of the program; what career counseling services they received; what other factors influenced their career choice; and whether they would recommend the high school biomedical program to other students contemplating a career in healthcare.

Subjects and Data Analysis

Through the Midwestern College of Health Professions, a mailing list was obtained of all pre-health or health major (current or recent) students. A total of 1,358 subjects were identified and mailed the survey. The data were analyzed using descriptive statistics. Surveys were accepted between August 30th and October 9th, 2007.

RESULTS AND DATA ANALYSIS

Demographic profile

Of the 1,358 surveys mailed out, a total of 241 usable surveys were returned within the allocated time frame; corresponding to a response rate of 17.7%. Demographic data indicated that in terms of gender, 13.7% were male and 86.3% were female. The mean age of the respondents was 26.38 years and the median was 25 years. In terms of race, 89.2% were White. The student status revealed 21.2% of the respondents were pre-professional health majors; 52.7% were professional health majors and 23.2% were graduates of a health program. As to whether

the respondents participated in a biomedical program while in high school, 7.1% of the respondents answered “Yes”. Of the respondents who did participate in a high school biomedical program, 94.4% indicated personal desire as the reason for their enrollment in the program and 5.6% chose positive role model as their answer. Finally, the last question in section one of the survey revealed that of the respondents who were enrolled in a high school biomedical program, 11.1% chose not to major in or apply to a health care program upon graduation while the remaining 88.9% did go on to pursue a career in health care (Table 1).

Table 1

| Respondents Characteristics (n=241) | | Percent |
|---|-------------------------|----------------|
| Participation in biomedical program | | |
| | Yes | 7.1 |
| | No | 92.9 |
| Gender | | |
| | Male | 13.7 |
| | Female | 86.3 |
| Race | | |
| | Asian | 3.3 |
| | African American | 1.7 |
| | Hispanic | 3.7 |
| | White | 89.2 |
| | Multi-race | 0.8 |
| | Other | 1.2 |
| Student Status | | |
| | Pre-professional at WSU | 21.2 |
| | Professional at WSU | 52.7 |
| | Graduate of WSU | 23.2 |
| | Neither | 2.9 |
| Reason for enrollment in a biomedical program | | |
| | Personal desire | 94.4 |
| | Positive role model | 5.6 |
| After enrollment chose not to major in health care | | |
| | Yes | 11.1 |
| | No | 88.9 |
| Age | | |
| | Mean | 26.38 |
| | Standard deviation | 6.931 |

Other information gathered from the analysis of the demographic data showed that 88.8% of the respondents enrolled in the college of health professions attended high schools within the state of Kansas. Missouri and Nebraska each had 2.1% of representative respondents and an accumulative 7% of the respondents listed one of the other states as their high school state. In addition to listing the state in which they attended high school, the respondents were asked to name the high school they attended; the results of which can be viewed in Table 2.

Table 2

Table of respondents high school states

| State | School | Percent |
|--------------|----------------|----------------|
| Kansas | | 88.8 |
| | Andale High | 2.1 |
| | Bishop Carroll | 3.3 |
| | Derby High | 2.5 |
| | East High | 2.5 |
| | Goddard High | 2.1 |
| | Maize High | 2.1 |
| | Mulvane High | 4.1 |
| | Northwest | 4.1 |
| Missouri | | 2.1 |
| Nebraska | | 2.1 |
| Other | | 7 |

Research questions

Section two of the survey was formulated to ascertain the respondents' views on their biomedical program (if attended); thereby determining the perceptions of the program in preparing and supporting students in their pursuit of different healthcare careers. A summary of section two can be found in Table 3.

Table 3

Perception Ratings on Biomedical Programs (n=18)

| | Strongly Agree | | Strongly Disagree | |
|---------------------------------------|-----------------------|------|--------------------------|------|
| | 1 | 2 | 3 | 4 |
| Insight into career options | 44.4 | 33.3 | ~ | 22.2 |
| Comprehensive health curriculum | 27.8 | 61.1 | ~ | 11.1 |
| Academic support | 11.1 | 38.9 | 22.2 | 27.8 |
| Clinical experience opportunities | 44.4 | 22.2 | 16.7 | 16.7 |
| Counseling and assistance | 16.7 | 11.1 | 38.9 | 11.1 |
| Factual information on health careers | 16.7 | 33.3 | 22.2 | 27.8 |
| Preparation for health care career | 27.8 | 38.9 | 22.2 | 11.1 |
| Would recommend biomedical program | 61.1 | 33.3 | ~ | 5.6 |

This portion of the survey pertained only to those respondents who had participated in a high school biomedical program. With that in mind, beginning with insight into health care career options, 44.4% of the respondents strongly agreed that the program did provide them with insight into the vast variety of possible health career options, 33.3% moderately agreed and 22.2 % disagreed. Regarding the programs academic curriculum, 27.8% strongly agreed that the programs provided them with a comprehensive academic curriculum geared towards a career in healthcare, while 61.1% moderately agreed and 11.1% disagreed. The question pertaining to academic support revealed that 11.1% of the respondents strongly agreed and 38.9% moderately agreed that they received academic support including tutoring and mentoring to excel through the curriculum while 27.8 % disagreed. When asked if they were given opportunities for clinical experience by shadowing health care professionals and/or volunteering in clinical settings, 44.4% of the respondents strongly agreed, 22.2% moderately agreed, and 16.7% disagreed. Regarding counseling and assistance in completing an application to a healthcare program, 16.7% of the respondent strongly agreed that they did receive the assistance they needed, 11.1% moderately agreed, 38.9% disagreed, and 11.1% strongly disagreed. A total of 16.7% of the

respondents strongly agreed and 33.3% moderately agreed that the program provided them with valid factual information about the different health care careers, required length of study, training, and possible life style demands post graduation, while 27.8% disagreed. When asked if as a result of the biomedical program the respondents felt better prepared for the challenges of a career in health care, 27.8% strongly agreed, 38.9% moderately agreed and 11.1% disagreed. Finally, an accumulative 94.4% of the respondents indicated that they would highly recommend enrollment in a biomedical program to other students contemplating a career in health care and 5.6% disagreed.

DISCUSSION

The results of the survey were both promising and disconcerting at the same time. The results were promising in that it appears the biomedical programs have been successful in preparing and supporting students in their pursuit of different health care careers, but disconcerting because only a small percent of the pre-professional and professional healthcare students at this Midwestern College participated in a high school biomedical program. Furthermore, with a majority of the healthcare students being white and female, it does not appear that the biomedical programs have succeeded in addressing the disparity of minority and underrepresented students in healthcare tracks. However, it is important to note that the data must be interpreted with the caveat that the response rate was low at 17.7%.

Summary of results as compared to literature

Demographically, the results of the survey were very much in keeping with other similar studies.^{5, 7, 8, 10} Results from section one of the survey were consistent with other studies, in that the majority (89.2%) of the respondents were white, while only 1.7% were African American, 3.7% were Hispanic and an accumulative 5.4 % representing all the other ethnic groups.^{5, 7, 8, 10}

This data suggests that ethnic barriers still persist and further investigation is needed into why they persist in order to overcome them. Demographic findings in section one also revealed that majority (86.3%) of the respondents were female while only 13.7% were male; once again consistent with other studies in the literature reviews.^{1, 3, 5-8, 10} While these results suggest a gender stereotyping, this study did not explore the difference in perceptions of healthcare careers among males and females. One striking demographic finding was that of all the respondents who did attend a biomedical high school program in Kansas, only a small percent of those students reported having graduated from a biomedical program in public schools.

Addressing research question two, where 88.9% of the respondents who did participate in a high school biomedical program upon graduation chose to major in or apply to a healthcare program, demonstrated that the programs may have been successful in preparing and supporting its students in their pursuit of different healthcare careers. This result was highly comparable to other similar studies of health track students in Texas and Georgia.^{5-7, 10} Section two of the survey revealed that the respondents' perceptions of their programs were largely positive. Majority of the respondents who did participate in a biomedical program accumulatively agreed (strongly or moderately) that the program was beneficial in the following areas by providing: insight into career options (77.7%); a comprehensive health curriculum (88.9%); academic support (50%); clinical experience opportunities (66.6%); factual information on health careers (50%); and preparation for healthcare career (66.7%). The program's success was validated by the fact that a resounding 94.4% of the respondents who graduated from a biomedical program indicated that they would highly recommend the programs to other students contemplating a career in healthcare. Similar success was achieved by other biomedical programs as documented in the studies by Carline, Soto-Greene, Mishoe, Bruce and Thomson.^{1, 3, 5-7, 10} Analysis of

question 13 of the survey revealed that the area that most needed improvement was student counseling. An accumulative 50% of the respondents who completed section two indicated that they did not receive the counseling and assistance they needed. In a similar study, findings about counseling support indicated that inadequate or inappropriate counseling services may, in fact, be hindering a significant number of students in their career pursuits.⁷

Overall significance of the study findings and opportunities for future research.

Overall, students who enroll in high school biomedical programs found them beneficial in preparing for a career in healthcare. The programs appeared to be successful in encouraging and supporting its students in their pursuit of different healthcare careers. Of the large number of respondents who did graduate from a biomedical program, and selected to major in or apply to a health care program, provided supporting evidence that the programs were attaining their goal of fostering students into the healthcare profession. While this study did not explore the recruiting strategies of the biomedical programs, the respondents were asked to indicate their reason for enrolling in the biomedical program and of the 18 respondents, 94.4% selected “personal desire” and 5.6% selected “positive role model” but none chose “formal recruitment.” This was significant and should be the focus of future studies as time and effort is invested in formal recruitment to actively compete for male, minority, nontraditional, and underrepresented students. Furthermore, with 89.2% of the respondents being white, this study demonstrated that there was a great need in the Midwest for interventions aimed at bringing racial and ethnic diversity to the healthcare profession.

Conclusions

There is no denying the increased demand for health care professional or the inadequacy of the pool of prospective healthcare students. While interventions like biomedical high school

programs and community based partnerships between universities, public schools, and organizations are in place to address these issues, it may not suffice as evident by the small percent of pre-professional and professional healthcare students at this Mid Western College of Health Professions who participated in a high school biomedical program. More aggressive evaluations of these programs need to be conducted and improvements need to be implemented so that no time is lost in ensuring the growth of the pool of qualified pre-professional health care students. Also the importance of a diversified healthcare workforce must be reiterated for the benefits are far reaching and impact the United States. To that end, greater intervention is needed by health profession colleges to draw underrepresented minorities into the healthcare profession which includes assisting with early preparation and motivation of such students to enter into health profession careers and reconceptualizing college admissions practices to place greater emphasis on the character strengths rather than the academic ability of applicants.

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APPENDIX

**Prevalence of Health Professional Students
at
Wichita State University attending
a
High School Biomedical Program**

Survey

Graduate Student: Kameshni Dennill, PA-S
Wichita State University

Faculty Advisor: Richard Muma, PhD, PA-C
Wichita State University



WICHITA STATE UNIVERSITY

Dear WSU Health Professional Student/Graduate:

The following survey was developed for my Wichita State University Physician Assistant (PA) Master Research Project to investigate the prevalence of pre-health professional major students at WSU who attended select biomedical programs (also known as a health career track or emphasis) during their high school years. Even if you did not participate in a high school biomedical program, we would like to collect some basic demographic information from you. Therefore, you have been selected because you were identified as either a (current or past) pre-health/medical major or enrollee in a WSU health program. Along with approximately 1500 other individuals, the survey will also ask about your perceptions of these programs in preparing and supporting you in your pursuit of different health care careers. The results will be beneficial to college faculty and administrators who aim to improve the efficacy of high school biomedical programs, which are instrumental in recruiting students to college-level health care programs. Please indicate your responses using this survey. It is not likely that participation will cause you risk; however, to minimize risk every effort will be made to not share your individual results and only report aggregate results, which will eliminate harm to you, protect your privacy and prevent discrimination of any kind. Participation is voluntary and consent to participate in this study is implied if you complete and return the survey. You will not incur any personal expense, other than time, in connection with this research project. All data will be kept in my possession in a locked file cabinet. This survey has been approved by the Wichita State University Institutional Review Board. **Approximate time to complete the survey is 5 minutes.** Thank you for your time and participation. Please make note of contact information below for any questions or concerns.

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316/978-3011
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Section I: General Information

1. Gender:
A. Male
B. Female

2. Race:
A. Asian
B. African American
C. Hispanic
D. Native American
E. White
F. Multi-race
G. Other

3. Age:

4. Name of High School Attended:

High School City State

5. Current Student Status:

- A. Pre-professional health major at WSU
B. Professional health major at WSU, list program _____
C. Graduate of WSU health program, list program _____
D. Neither

6. Were you enrolled in a biomedical (or health career track) program while in high school?

- A. Yes
B. No

If you answered Yes to question #6, please continue. If you answered NO, please stop and return the survey.

7. Was your enrollment into the biomedical program primarily the result of:
A. Formal recruitment
B. Personal desire
C. Positive role model
D. Family encouragement
E. Other incentive. Specify _____
8. After or during your enrollment in a biomedical program, did you choose NOT to major in, or apply to a health care program?
A. Yes
B. No

Section II: Views on your biomedical program

For statements 9-16, circle the one response that best describes your perception. Only those who attended a high school biomedical program should complete these questions.

THE HIGH SCHOOL BIOMEDICAL PROGRAM PROVIDED ME WITH:

9. Insight into the vast variety of possible health care career options.
Strongly Agree Agree No opinion Disagree Strongly Disagree
10. A comprehensive academic curriculum geared towards a career in health care.
Strongly Agree Agree No opinion Disagree Strongly Disagree
11. Academic support (e.g., tutoring, mentoring, other) to excel through the curriculum.
Strongly Agree Agree No opinion Disagree Strongly Disagree
12. Opportunities for clinical experience (e.g., shadowing health care professionals, volunteering in clinical settings)
Strongly Agree Agree No opinion Disagree Strongly Disagree
13. Counseling and assistance in completing my application to the WSU College of Health Care Professions
Strongly Agree Agree No opinion Disagree Strongly Disagree
14. Factual information about the different health care careers, required length of study, training, and possible life style demands post graduation.
Strongly Agree Agree No opinion Disagree Strongly Disagree
15. Better preparation for the challengers of a career in health care.
Strongly Agree Agree No opinion Disagree Strongly Disagree

Section III: Miscellaneous Question

16. I would highly recommend enrollment into a biomedical program to other students contemplating a career in health care.
Strongly Agree Agree No opinion Disagree Strongly Disagree

**Thank you for completing this survey!
Please return in the postage paid envelope.**

VITA

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