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Evaluation of the Pathways for Students into Health Professions: The Training of Under-Represented Minority Students to Pursue Maternal and Child Health Professions

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Abstract The Pathways for Students into Health Professions program is one of four nationally funded programs by the Maternal and Child Health Bureau of the US Department of Health and Human Services to support the training of undergraduate students, particularly from under-represented minority groups to pursue maternal and child health professions. To assess the program's impact on student ratings, knowledge, and interest in maternal and child health professions. A baseline survey on student ratings and knowledge in maternal and child health topics and careers, public health topics, and career development topics was provided to 32 students at the beginning of their first year in the program and approximately 1 year after participation. Half of the students (16 students) in the program from 2009–2011 were from traditionally underrepresented minority groups. After participation, students reported significantly higher ratings of interest in maternal and child health topics and careers and in receiving adequate academic and career guidance. Students also reported significantly higher knowledge of public health, childhood and

maternal morbidity and mortality, health care disparities, and life course health development. The program's didactic, experiential, and mentorship activities are changing student ratings and knowledge in a favorable direction toward maternal and child health careers and topics. Undergraduate training programs may be an important mechanism to strengthen the pipeline of a diverse health-care workforce.

Keywords Maternal and child health · Public health · Under-represented students · Minority students · Mentoring

Background/Introduction

Healthy People 2020 highlights the need to improve the health and well-being of women, infants, children, and families and is an important public health goal for the United States (US) [1]. To effectively address this goal, an array of healthcare professions with an understanding and interest in caring for these unique populations is necessary. Furthermore, an emphasis on a culturally diverse and representative healthcare workforce is also needed given the rapid growth of Latino and Asian populations in the US [2–5]. Effective maternal and child health (MCH) pipeline programs can be one way to meet these healthcare workforce goals.

Few MCH pipeline programs extend training to undergraduate students and more commonly focus on post-graduate or terminal degree professionals [6]. Addressing training at the undergraduate level, however, provides an important opportunity to expose students to maternal and child health professions. A small number of undergraduate programs have focused on specific areas of public health such as interdisciplinary training, behavioral

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health, breastfeeding, and occupational therapy and have demonstrated impact on undergraduate student knowledge and skills, and interest in specific areas of graduate education [7–10]. Building upon this knowledge and, recognizing the dearth of MCH undergraduate programs and the need for increased MCH workforce diversity, the Pathways for Students into Health Professions (PSHP) program was developed at the University of California, Los Angeles (UCLA).

UCLA is a public university and is the third-oldest campus of the University of California system. In the fall of 2013, 4 % of African-American students, 18 % of Latino students, and less than 1 % of American India/Alaskan Native students made up the total undergraduate student enrollment of approximately 28,000 students. The PSHP program at UCLA was the first program on campus to focus on fostering the development of undergraduate student knowledge, skills, and interest in graduate school training in MCH professions among underrepresented minority (URM) students. The lack of information on MCH undergraduate training programs coupled with the well-established evidence that attitudes can affect intentions to pursue a career, led the PSHP to pursue a strategy to impact student ratings, knowledge, and interest in MCH professions.

Program Description

The PSHP program is one of four MCH pipeline training programs funded through the MCH Bureau of the US Department of Health and Human Services Health Resources and Services Administration. The PSHP program exposes minority undergraduates to the field of MCH through didactics that include a 4-unit course, summer field practicum at an MCH community-based organization or agency, and a volunteer experience in a student-run organization focused on helping children and families. Students also receive academic advising and career counseling by a faculty mentor. More details about the program course, curriculum, and faculty is available on the web (<http://medpeds.med.ucla.edu/pshp.html>).

Assessment/Methods

Sample

Study participants were students in the PSHP program from 2009–2011. In 2009 the program included 10 students, an additional 17 in 2010, and 12 in 2011 for a total of 39. Since its inception, the PSHP program averages 13 students per year.

Data Collection

A paper-based survey was designed to examine whether student-rated measures and knowledge scores could increase by exposure to the main components of PSHP program. The survey underwent construct validity by using a panel of experts to examine the items and evaluate what each specific item was intended to measure. These experts included a survey development researcher, a medical education expert, and two faculty alumni of a Maternal and Child Health Training Program (post-doctoral program) at UCLA's School of Public Health. A baseline survey on knowledge and ratings about MCH, public health, and career development topics was provided to all PSHP on the first day of their 4-unit required course, "Foundations of Maternal and Child Health," which is their first PSHP experience. A follow-up survey was given 1 year later during a required evening seminar. Survey analysis was approved by UCLA's Institutional Review Board.

Students were asked to provide basic demographic information, their current college major, and grade point average. To improve our outreaching efforts and the program, the survey collected information on where students learned about the PSHP program, their reasons for applying, what they found most helpful about the program at 1-year follow-up, and two-open ended questions about what they gained from participating in the PSHP program and whether the program influenced their educational or career paths.

The survey was also developed to measure student ratings about MCH career paths and topics and the adequacy of academic and career guidance. Students were asked to rate 13 MCH topic areas such as familiarity with MCH careers and services (i.e. I feel knowledgeable about the challenges that exist with the delivery of health services for children and families). Students rated these 13 topic areas by using a 5-point Likert-scale (strongly disagree to strongly agree). Eight items were also included that measured student's ratings about the academic and career guidance they received, their post-college plans, and interest in pursuing a MCH profession (i.e. I feel I received adequate career guidance from my faculty mentor). Students used a 5-point Likert-scale (strongly disagree to strongly agree) to rate these nine items.

The survey included knowledge-based questions on MCH and public health topics like childhood morbidity and mortality, health care disparities, and a life course approach to health development. The survey included 14 knowledge questions for the 2009 cohort and additional questions were added in subsequent years for a total of 20 questions for the 2010–2011 cohorts.

Table 1 2009–2011 Demographics for students in the UCLA Pathways for Students into Health Professions (n = 32)

	Percent or mean
Age, mean years	19
Race/ethnicity	
Black	16 %
Latino	34 %
Asian	29 %
Southeast Asian	9 %
Pacific Islander	6 %
White	3 %
Other	3 %
Sex	
Male	12 %
Female	88 %
Year in college	
1st year %	47 %
2nd year %	37 %
3rd year %	16 %
GPA, mean	3.1
Major	
Basic science	38 %
Social science	33 %
Humanities	29 %
Future Career Plans*	
Medicine	38 %
Nursing	13 %
Dentistry	12 %
Social welfare	4 %
Public health	29 %
Other	4 %

* Percentages rounded to nearest whole number

* Major and future career plan responses taken from post surveys (1 year after participating in PSHP)

Analysis

Data analyses were performed using STATAIC 10.0 software (StataCorp, College Station, TX). Data from the baseline survey reflect student baseline ratings, exposures, and knowledge prior to starting the PSHP program. Responses from the 1-year follow-up measured the impact of the PSHP program. Mean rating scores (ranging from 1–5) between baseline and 1-year follow-up were compared using a paired *t* test. Knowledge scores were created based on the number of correct answers to each of the 14 multiple-choice questions of the survey in 2009 or the 20 multiple-choice questions of the survey in 2010–2011. The possible score range for 2009 was therefore 0–14 and for 2010–2011, the possible score range was 0–20. Mean knowledge scores were compared at baseline and 1-year follow-up using paired *t* tests. The qualitative data from the two open-ended questions were analyzed by counting the frequency of each response.

Findings

The survey had an 82 % response rate, with 32 students completing baseline and 1-year follow-up surveys. A 100 % response rate was not achieved as some students may have missed the first day of class or missed the designated evening seminar during which the 1-year follow-up surveys were administered. On average, 34 % of the students self-identified as Latino and 16 % as African-American (Table 1). The majority of students in the PSHP program were female and the top two career paths students' desired were in the fields of medicine and public health (Table 1).

In two of the 3 years, the most important initial reason for students applying was the interest in faculty career guidance and mentoring. After 1 year of participation students ranked learning about public health issues the highest across all 3 years (Table 2). Student responses to the two open ended questions of the survey emphasized learning about MCH topics and careers and, public health topics.

Comparing students' average ratings toward MCH topics between baseline and 1-year follow-up, show significant increases in 11 of the 13 topic areas (Table 3). These increases included positive ratings about perceived knowledge of child health, maternal health, services and programs for children and families, and cultural competency. No significant differences were found in pre and post student ratings about their ability to research MCH topics. Student interest in contributing to MCH programs and services did increase from pre to post but the gain was not statistically significant.

Ratings of academic and career guidance significantly increased in seven of the eight areas (Table 4). Students reported significant positive changes in their rating towards academic and career guidance support, development of relationships with faculty, and interest in pursuing an MCH career. Pre-post rating differences in self-reported confidence to carry out future educational and career goals were not statistically significant.

Knowledge in MCH also increased after 1 year of participation in the PSHP program. In 2009 the range of increase in the knowledge scores increased from 6 to 7, out of a possible 14 score. In 2010 and 2011, the knowledge score increased from 10 to 13 and 12 to 15, respectively out of a possible score of 20. With the exception of students in the 2009 cohort, students on average scored 3 points higher (15 %) on the knowledge section of the survey 1 year after participating in the PSHP program.

Conclusion

The results of our evaluation confirm our hypothesis that the PSHP didactic, practicum, and mentorship activities

Table 2 Initial reasons for applying to Pathways for Students into Health Professions and post-1 year areas of helpfulness (n = 32)

Reasons*	2009	2010	2011	Area of helpfulness ^a	2009	2010	2011
	(n = 10)	(n = 14)	(n = 8)		(n = 10)	(n = 14)	(n = 8)
Career guidance	3.8	4.1	4.8	Career guidance	3.4	3.6	4.3
Help with applying to Grad/ Prof school	5.1	4.5	3.9	Help with applying to Grad/ Prof school	2.3	3.9	2.3
Faculty mentoring	5.7	4.1	4.6	Faculty mentoring	4.2	2.9	5.1
Interest in public health	4.4	4.6	4.6	Learning about public health	4.2	3.9	4.9
Interest in MCH	3.6	3.8	4.1	Learning about maternal and child health	4.1	3.6	4.9
Work with the community	3.6	3.8	4.1	Work with the community	4.1	3.6	4.9

Each reason rated on a scale of 1–7, with 7 being the most important

* Why did you apply to the Pathways for Students into Health Professions?

^a How helpful has the Pathways for Students into Health Professions been for you?

Table 3 Differences in student ratings about maternal and child health issues at baseline and 1-year follow-up (n = 32)

Topic areas	Mean score		
	Pre	Post	<i>p</i>
Knowledgeable about public health	2.4	4.3	<0.05*
Knowledgeable about MCH	2.3	4.4	<0.05*
Knowledgeable about determinants of health	3.4	4.8	<0.05*
Knowledgeable about life course theory of health development	2.9	4.5	<0.05*
Knowledgeable about MCH problems and issues	2.7	4.4	<0.05*
Knowledgeable about challenges with delivery of health services for children and families	2.7	4.4	<0.05*
Capable of researching topics related to MCH topics	4.3	4.3	0.56
Knowledgeable about cultural competence	3.8	4.4	<0.05*
Interest in contributing to maternal and child health programs and services	4.4	4.5	0.32
Participation in community service learning is important for future educational/career goals	4.65	4.8	0.06
Participation in community service learning is important to “give back” to a community	4.6	4.9	<0.05*
Knowledgeable about how MCH topics will be relevant to my future career	3.75	4.4	<0.05*
Confident in explaining MCH professions to family and friends	3.3	4.2	<0.05*

Each statement rated using a 1–5 scale, 5 representing strongly agree

* Significant difference in rating scores between baseline and 1-year follow-up via a paired *t* test (*p* < 0.05)

can change student ratings and knowledge in a favorable direction toward MCH careers and topics. It is promising that these results are achieved in a population of students that have a racial and ethnic make-up consistent with the workforce needs in Los Angeles County, California, and nationally. Our results indicate that an MCH undergraduate training program, which targets URM students, can be an

Table 4 Differences in student ratings on academic and career development at baseline and 1-year follow-up (n = 32)

Program area	Mean score		
	Pre	Post	<i>p</i>
Support by faculty at college institution	3.6	4.0	0.05
Adequate receipt of academic guidance from a faculty mentor	2.7	4.2	<0.05*
Adequate career development guidance from a faculty mentor	2.4	3.9	<0.05*
Have ongoing relationship with a faculty mentor	2.4	3.8	<0.05*
Have resources and connections to pursue a research or community project in areas of interest	3.2	3.7	<0.05*
Clear understanding of educational/career goals	3.3	3.9	<0.05*
Confidence in carrying out educational/career goals after college graduation	4.0	4.1	0.38
Interest in pursuing a career within maternal and child health programs/services	3.8	4.2	<0.05*

Each statement rated using a 1–5 scale, 5 representing strongly agree

* Significant difference in rating scores between baseline and 1-year follow-up via a paired *t* test (*p* < 0.05)

important mechanism to strengthen a diverse healthcare workforce.

The PSHP program intentionally emphasized faculty academic and career guidance based on the extensive literature showing that mentoring is one of the most powerful tools in motivating URM students to graduate from college and matriculate into graduate school [11–14]. The PSHP mentoring component was operationalized by pairing each student with a faculty mentor and requiring quarterly meetings and more frequently if needed. The PSHP program had a statistically significant and positive impact on student ratings about the adequacy of academic and career guidance received from a faculty member after 1 year in the program. Interestingly, faculty mentoring was the most

important reason why students initially applied to the PSHP program. Faculty mentoring may have been a big draw for UCLA students in light of the mentoring structure of other training programs found on campus where mentoring is usually provided by graduate students or program advisors and, the size of UCLA which can make meeting and interacting with faculty difficult. Faculty mentoring, therefore, can be an important recruitment tool for other undergraduate MCH training programs at large institutions, and is a critical component of undergraduate training programs.

Students in the PSHP program also learned and developed awareness about MCH topics and careers. At baseline, students rated interest in MCH as one of the lowest reasons for applying but, at the 1-year follow-up students rated learning about MCH and public health as the most helpful area of the program. In addition, the largest change in pre- and post-rating scores were observed for knowledge about MCH problems and issues and challenges with the delivery of health services for children and families. Students also had significant positive changes in their ratings about pursuing an MCH career. The responses that emerged from the qualitative questions and the small but significant gains in knowledge scores also demonstrated the learning and awareness about MCH topics and careers. In summary, the PSHP program impacted student ratings toward MCH careers and topics in a favorable direction which is an important initial step to make students more sensitive to these important topics and appreciative of their relevance to communities and population health. Despite these results, the evaluation showed that at baseline there is a general lack of interest and knowledge about MCH topics and careers among undergraduates at UCLA. This is likely to be the case at other institutions given that high school or early college educations are unlikely to include MCH or public health curricula. Other institutions who may want to develop or sustain an MCH undergraduate training program, therefore, may need to address the low interest in the field of MCH.

The evaluation results highlight areas for improvement for the PSHP program. It is possible that larger gains in knowledge were not observed because students may require more than a 4-unit undergraduate course to learn MCH and public health topics. It is also probable that the pre-test and post-test differences in ratings for several of the MCH items may have been larger as the process of recruitment and enrollment into the PSHP program could have influenced pre-test ratings. The fact that self-perceived skills and confidence did not change may be attributed to the short time period of the evaluation and the challenge of providing undergraduate students with opportunities to develop specific skills and confidence that may require more time to take hold. For example, students' confidence in successfully carrying out their educational and/

or career goals after graduation did not change. A likely explanation is that young undergraduates in their 1st and 2nd year of college begin to understand the requirements and competitiveness of applying to graduate or professional schools through the PSHP program, and while understanding these requirements is essential for them to begin and maintain an appropriate undergraduate path, it may not increase their confidence in the short term. It is also likely that skill development may require more involved and mentored experiences in the field and a curriculum that is more applied. Providing opportunities for students to develop more skills is an area for the PSHP program and other undergraduate pipeline programs to consider.

There are limitations to this study. This program focused on students early in their college careers, and it may be useful to compare program results with students who experience a natural progression of mentoring and career support during college. The promising results of this program may be further strengthened with a comparison group of students who did not participate in the PSHP program but that is logistically difficult. We have limited data on student's post-graduation standings as the last two cohorts are just now graduating or applying to graduate and professional schools. We continue to collect data on our students with every cohort and these data along with future cohorts will continue to strengthen our results and continue to provide information on how to improve the program.

In summary, evaluation of this innovative program targeting undergraduate minority students early in their college programs showed improvements in the measures that were of greatest interest to the program, including receiving useful mentoring and career development support, and increasing interest in maternal and child health careers. The services and supports offered through the PSHP program could easily be integrated into many other universities to motivate and build skills in this target population. There is an opportunity for universities to add to the successful components of the PSHP program to build a more diverse MCH workforce.

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Conflict of interest All authors have approved the manuscript as submitted and none of the authors have conflict of interest to declare for the past 3 years dating from the month of this submission.

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