National Hispanic Medical Association's College Health Scholars Program

Final Program Evaluation Report

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Center for Evaluation and Applied Research
The New York Academy of Medicine

INTRODUCTION

In May 2017, the National Hispanic Medical Association (NHMA) received funding from the US Department of Health and Human Services, Office of Minority Health (OMH) to support the development, implementation, and evaluation of the College Health Scholars Program (CHSP). This 4-year program aims to increase the diversity of the health workforce by expanding the number of practicing Hispanic physicians, health professionals and scientists/researchers. To assess progress towards this aim, the program tracks and compares two groups of college students; a control group (CG) and an intervention group (IG), as required by the funder.

Mentoring is the principal component of CHS. IG participants are matched with a mentor who is a Hispanic[1] health care professional or student in a post-graduate program (e.g., medical school) to then participate in regular mentoring sessions. The student and mentor discuss topics related to academic preparation, personal development, and finances. Mentoring session discussion prompts are sent by MentorNet, a virtual mentoring platform and program partner. MentorNet prompts cover topics identified as potential challenges for Hispanic students as they progress through college and prepare for medical/graduate school; they are sent to IG students and mentors regularly, until the mentee has graduated college and completed the CHSP. Intervention group students also have access to quarterly webinars on the above-mentioned topics and to a private virtual student group with other IG students. Both the IG and CG students can attend the NHMA pre-health student conferences and access the NHMA website and resources page.

To evaluate the CHSP, NHMA partnered with the Center for Evaluation and Applied Research at The New York Academy of Medicine (NYAM). The purpose of the evaluation was to assess the progress, impact, and effectiveness of the CHSP on recruiting, retaining, and supporting Hispanic college students interested in becoming healthcare professionals, scientists, or researchers. This is the final evaluation report. It includes findings from all years, with a particular emphasis on year 4. It also describes broader findings on program impact and lessons learned.

METHODS

RECRUITMENT

Program and study recruitment occurred simultaneously; participation in the evaluation was a requirement for CHSP program participation. To recruit mentors, NHMA conducted outreach to their members and Association of American Medical Colleges (AAMC) alumni. Mentor eligibility was limited to individuals who currently worked in a health-related field or were enrolled in medical or a health-related graduate school, with a preference for individuals who identified as

[1] The focus is on recruiting Hispanic mentors however, in some instances, other health care professionals of color have joined the program as mentors.

Hispanic. Potential mentors also had to be willing and available to conduct monthly check-ins with a mentee for a minimum of one year. Once recruited, NHMA explained the program to mentors in greater detail, answered any questions and requested they complete a baseline survey and MentorNet profile that would be used to later match them to a mentee.

Any student at a U.S. college who identified as a person of color and was interested in pursuing a career in health was eligible to participate in the CHSP. NHMA used multiple methods to recruit students, including:

- In-person and online recruitment at pre-health conferences and the NHMA annual conference;
- Partnering with various organizations and colleges including the Latino Medical Student Association (LMSA), the Summer Health Professions Education Program (SHPEP), the Association of American Medical Colleges (AAMC), University of the Incarnate Word, and Charles R. Drew University of Medicine & Science in Los Angeles; and,
- Distribution of program flyers to their own members, and to colleges and universities throughout the country.

For students who attended an NHMA pre-health conference in person, NHMA determined student eligibility by asking about health career of interest, provided a brief description of the program, answered any questions students had and consented interested individuals. Students who completed the online registration form but were unable to attend the in-person conference were also asked about their interest in participating in the program and if so, were provided an online consent form. These students were also provided contact information for NHMA program staff if they had additional questions or concerns.

MATCHING, RANDOMIZATION, AND PARTICIPATION

After consenting to participate, NHMA used the mentor and student baseline surveys to match students to one another (for randomization), and to a mentor. The original criteria for matching was: gender, age (for matching student pairs, only), health area of interest, and U.S. region. Initially, the CHSP was only open to college students who identified as Hispanic. However, to support recruitment efforts, NHMA received approval from the funder to broaden the eligibility criteria to any college students who identified as a person of color. As the program progressed, other factors were also considered for matching, including background characteristics (e.g., language spoken at home, first-generation in their family to attend college, school attended/attending). This list of matched student pairs was sent to NYAM staff who then randomized one member of each pair to be in the IG, using Excel's random value generator. After receiving the list of randomized students, NHMA contacted each student randomized to the IG and CG to explain the program in greater detail, including the participation requirements, and to answer questions and confirm interest. Because the program has an IG and CG, the original program description included in the consent form was somewhat vague and explained that students would be split into two groups and receive different services but did not explain the specific types of services each group would receive. This was intention to mask the intervention to CG students. Over the course of the 4 years, approximately 10 students opted to not participate after they were told

about the program in greater detail via a phone call with NHMA program staff due to lack of time in their schedule. The same process of calling, explaining the program, and answering questions was completed for each paired mentor to confirm their understanding and continued interest.

To participate, IG students were required to:

- Complete the baseline (i.e., registration form) and an annual survey each year they were in the program;
- Connect with their mentor 1x/month via phone, email, text, video chat or in-person;
- Attend 3 out of 4 quarterly webinars: and
- Submit unofficial transcripts to NHMA after each academic term.

Optional program activities include:

- Submitting journal entries after connecting with their mentors; and
- Participating in the virtual student group.

DATA COLLECTION, MANAGEMENT & ANALYSIS

As illustrated in Table 1 and described below, this study used a mixed-methods approach, collecting both qualitative and quantitative data. All data collection instruments, including surveys, focus group and interview topic guides, and recruitment requests were developed by NYAM in collaboration with NHMA and approved by NYAM's Institutional Review Board.

Quantitative Methods: Quantitative data were collected using the following methods:

- Surveys: Each survey was sent to the appropriate CHSP participant group via email with a link for completion; students received two follow-up reminders per survey. Reminders were limited to two, to respect the voluntary nature of participation in research and to avoid the appearance of harassment. There were no financial incentives for survey completion, except for the final "Exit Survey," which included a $10 gift card.
- Transcripts: Requests for unofficial transcripts were sent by NHMA program staff and included two follow-up reminders. Transcripts, once received, were entered into an online survey data platform by NHMA staff, who double checked them, for accuracy.
- Implementation data: MentorNet discussion prompts up-votes and down-votes were collected via MentorNet and shared with NYAM upon request. Journal entries were collected via NHMA and shared with NYAM.

Surveys and transcript data were managed and stored on the web-based data platforms, Qualtrics and QuestionPro. Stata statistical software (version 15) and Excel were used to clean and manage survey and transcript data, and to run descriptive statistics, t-tests, and Mann-Whitney U tests.

OMH required a power calculation to ensure that the projected sample size was sufficiently large for statistical significance. NYAM conducted the analysis using two outcomes: GPA and matriculation rates. Estimated effect sizes were derived from three studies examining the impact

of supportive programming for student matriculation into STEM careers and medical schools [2][3][4]. (For a description of the power calculation, see Appendix 1). As of year 4, the CHSP had over 400 student CHSP participants in each study arm, indicating that the study is sufficiently powered to detect a statistically significant difference between the IG and CG according to these two variables, if a significant difference exists.

Qualitative Methods: Qualitative data were also collected each year; the method and participant population varied (as described immediately below), so that multiple stakeholder groups and perspectives could be incorporated into the findings.

- Year 1: One focus group with current medical students to inform MentorNet discussion prompts. Conducted in person during the NHMA annual conference;
- Year 2: One in-person focus group with IG students during the annual conference and 5 interviews via Zoom with CHSP mentors to understand perspectives on program implementation, engagement, impact, and recommendations.
- Year 3: Nineteen interviews via phone and Zoom (n= 12 IG students and 7 CG students) to understand program perspectives, engagement, impact and to solicit recommendations, and to challenges experienced by students in the CG.
- Year 4: One focus group with CHSP mentors and two focus groups with CG students to understand program impact and engagement and to solicit recommendations.

All individuals who participated in an interview or focus group, apart from students in the Year 2 focus group, received honoraria as a thank you for their time. Students in the Year 2 focus group had received funding from NHMA for conference expenses, including travel, so did not receive additional honoraria. NYAM used semi-structured guides for each focus group and interview, to frame the conversation and ask about specific topics relevant to the evaluation. Focus group participants completed a brief demographic questionnaire to provide basic information about those in the group. All focus groups and interviews were audio recorded and professionally transcribed.

[2] *Campbell KM, Berne-Anderson T, Wang A, Dormeus G, Rodríguez JE. USSTRIDE program is associated with competitive Black and Latino student applicants to medical school. Medical Education Online. 2014;19(1):24200. doi:10.3402/meo.v19.24200*

[3] *D'Souza MJ, Shuman KE, Wentzien DE, Roeske KP. Working with the Wesley College Cannon Scholar Program: Improving Retention, Persistence, and Success. Journal of STEM Education: Innovations and Research. https://www.jstem.org/jstem/index.php/JSTEM/article/view/2239. Accessed September 19, 2019.*

[4] *Dupont WD, Plummer WD: "Power and Sample Size Calculations: A Review and Computer Program", Controlled Clinical Trials 1990; 11:116-28. http://biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize*

Table 1. CHSP Evaluation Data Sources				
	CHSP Participant Groups			Non-CHSP participants
	Intervention Group	Control Group	Mentors	Medical students
Quantitative Data				
Baseline survey	X	X	X	
Annual survey	X	X	X	
End of program survey	X	X	X	
Exit survey	X	X	X	
Unofficial Student Transcript	X	X		
MentorNet Discussion Prompt Votes	X		X	
Journal Entries	X			
Post-Webinar Satisfaction Survey	X			
Qualitative Data				
Interviews	X	X		
Focus Groups	X	X	X	X

FINDINGS

QUANTITATIVE FINDINGS

Mentor Baseline Survey

Table 2 shows the demographic characteristics of mentors from all cohorts (i.e., program years 1-4), as reported from the baseline mentor surveys. Eighty-one percent of all mentors were ages 25-34. Sixty-five percent of mentors were women, and the majority (90%) identified as Hispanic/Latinx. About half of mentors (52.2%) reported being the first in their families to attend college and about three-quarters (73.4%) reported 'doctor' as their current or intended profession.

Table 2. Mentor Baseline Survey Years 1-4: Mentor Demographic Characteristics (N=289)		
	n	**%**
Age		
18-24	40	13.8%
25-34	194	67.1%
35-44	34	11.8%
45-54	7	2.4%
55-64	3	1.0%
Prefer not to answer/Missing	11	3.8%
Gender		
Woman	188	65.1%
Man	91	31.5%
Missing	10	3.5%
Race/Ethnicity *		
Hispanic/Latinx	260	90.0%
White	26	9.0%
Asian/Asian American	11	3.8%
Black/African American	6	2.1%
American Indian or Alaska Native	1	0.3%
Native Hawaiian or Pacific Islander	1	0.3%
Other	6	2.1%
Prefer not to answer/Missing	8	2.8%
Region/Country of Origin		
West	102	35.3%
South	80	27.7%
East	38	13.1%
Midwest	26	9.0%
Puerto Rico	24	8.3%
Outside of the U.S.	11	3.8%
Prefer not to answer/Missing	8	2.8%
First in family to attend college		
Yes	151	52.2%
No	113	39.1%
Prefer not to answer/Missing	25	8.7%
Current or Intended Profession		
Doctor (MD or DO)	212	73.4%
Dentist	14	4.8%
Public Health Professional	11	3.8%
Registered Nurse	11	3.8%
Researcher	9	3.1%
Other	26	9.0%
Missing	6	2.1%

** multiple responses permitted*

Table 3 shows the educational experience of mentors. More than half (59.5%) of mentors had taken the MCAT exam. The most common challenges mentors experienced in college included cost of education, study skills, grades and/or difficulty of classes, competing responsibilities, and time required for studying.

Table 3. Mentor Baseline Survey Years 1-4: Educational Experience (N= 289)

	n	%
Graduate school entrance exams taken *		
MCAT	172	59.5%
GRE	43	14.9%
DAT	13	4.5%
TEAS	2	0.7%
Other	16	5.5%
None	8	2.8%
Missing	68	23.5%
Challenges experienced in college *		
Cost of education	108	37.4%
Study skills	89	30.8%
Grades and/or difficulty of classes	81	28.0%
Competing responsibilities	77	26.6%
Time required for studying	68	23.5%
Number of required years for school/training	34	11.8%
Personal motivation	27	9.3%
Lack of family or other social support	27	9.3%
Other	12	4.2%
Prefer not to answer/Missing	93	32.2%

** multiple responses permitted*

Student Baseline Surveys

Table 4 presents the demographic characteristics of IG and CG students from years one through four as reported on the baseline surveys. The CG has a total of 351 students as compared to the slightly larger intervention group of 385 students. Proportionally, the demographics of the IG are very similar to those of the CG: approximately three-quarters of students in each group are between 18-20 years and women. Over 85% in each group identify as Hispanic/Latinx. Students in both groups reside throughout the country, with the largest numbers (close to one-third) living in in the Western part of the United States. The greatest difference between the IG and CGs was the percentage who reported being the first in their family to attend college (64% in the IG vs. 53% in the CG). Slightly over half of students in each group also reported working part-time.

Table 4. Student Baseline Surveys Years 1-4: Demographic Characteristics				
	Intervention group (n= 385)		Control group (n = 351)	
	n	(%)	n	(%)
Age				
Less than 18 years old	1	(0%)	1	(0%)
18-20	293	(76%)	254	(72%)
21-23	55	(14%)	46	(13%)
24+	24	(6%)	34	(10%)
Prefer not to answer/Missing	12	(3%)	16	(5%)
Gender				
Woman	289	(75%)	267	(76%)
Man	92	(24%)	81	(23%)
Non-binary	1	(0%)	0	(0%)
Prefer not to answer/Missing	3	(1%)	3	(1%)
Race/Ethnicity*				
Hispanic/Latinx	340	(88%)	303	(86%)
Black/African American	48	(12%)	46	(13%)
White	32	(8%)	39	(11%)
Asian/Asian American	19	(5%)	20	(6%)
American Indian or Alaskan Native	11	(3%)	3	(1%)
Native Hawaiian or Pacific Islander	2	(1%)	1	(0%)
Other	12	(3%)	13	(4%)
Prefer not to answer/Missing	7	(2%)	2	(1%)
Region/Country of Origin				
West	129	(34%)	115	(33%)
South	100	(26%)	98	(28%)
Northeast	49	(13%)	39	(11%)
Midwest	17	(4%)	11	(3%)
Puerto Rico	8	(2%)	12	(3%)
Outside of the U.S.	44	(11%)	47	(13%)
Prefer not to answer/Missing	38	(10%)	29	(8%)
First in family to attend college				
Yes	247	(64%)	185	(53%)
No	120	(31%)	138	(39%)
Prefer not to answer/Missing	18	(5%)	28	(8%)
Work Status				
Part-time	217	(56%)	183	(52%)
Not working	135	(35%)	139	(40%)
Full-time	13	(3%)	20	(6%)
Yes, unspecified amount	3	(1%)	3	(1%)
Missing	17	(4%)	6	(2%)

** multiple responses permitted*

Table 5 presents the academic characteristics of the IG and CG students as reported in the baseline surveys. Like Table 4, the IG and CG student academic characteristics closely mirror each other. Approximately three-quarters of students in each group were either Freshman or Sophomores when they started the CHSP, and almost all (90% or more) reported being a full-time student. Approximately half of the students in each group declared a biological science as their major, and over half had completed Biology and Chemistry courses with a passing grade of "C" or above. At the time of the survey, most students had not yet taken a graduate school entrance exam.

Table 5. Student Baseline Surveys Years 1-4: Academic Characteristics				
	Intervention group (n= 385)		Control group (n = 351)	
	n	(%)	n	(%)
Year in School				
Freshman	116	(30%)	103	(29%)
Sophomore	178	(46%)	169	(48%)
Junior	69	(18%)	68	(19%)
Senior	2	(1%)	2	(1%)
Missing	20	(5%)	9	(3%)
Student Status				
Full-time	348	(90%)	330	(94%)
Part-time	35	(9%)	20	(6%)
Missing	2	(1%)	1	(0%)
Declared Major *				
Biological Sciences	198	(51%)	187	(53%)
Health Professions	35	(9%)	39	(11%)
Other STEM	34	(9%)	39	(11%)
Social Sciences	33	(9%)	20	(6%)
Public Health	17	(4%)	17	(5%)
Other	17	(4%)	16	(5%)
Undeclared	48	(12%)	38	(11%)
Missing	66	(17%)	53	(15%)
Completed courses with passing grade (C or higher) *				
Biology	243	(63%)	210	(60%)
Chemistry	229	(59%)	212	(60%)
Calculus	147	(38%)	132	(38%)
Organic Chemistry	90	(23%)	81	(23%)
Physics	68	(18%)	64	(18%)
Taken a graduate school entrance exam				
Yes	14	(4%)	19	(5%)
No	350	(91%)	322	(92%)
Missing	21	(5%)	10	(3%)

** multiple responses permitted*

Table 6 shows IG and CG students' extracurricular activities and career interests reported in the baseline surveys. Similar to Tables 4 and 5, the IG and CG are similar on most attributes. Almost all students planned to have a career in health or medicine, approximately three-quarters wanted to be a doctor, and over 80% are concerned about the cost of education. Approximately one-third of students in both groups felt that each of the resources identified

would be important in supporting their career goals. Almost all students reported interest in careers that served Hispanic and underserved communities. The greatest differences between the two groups are in current extracurricular activities and resources to support student's career goals. In comparison to 43% of IG students, 35% of CG students reported participating in a health or medical volunteer activity at the time of the survey. And whereas one-third (33%) of IG students reported financial counseling as important to support their career goals, 42% of CG students identified this resource as being important.

Table 6. Student Baseline Surveys Years 1-4: Extracurricular Activities and Career Interests				
	Intervention group (n= 385)		Control group (n = 351)	
	n	(%)	n	(%)
Current Extracurricular Activities *				
Health or medical volunteer activities	165	(43%)	123	(35%)
Health or medical research	58	(15%)	48	(14%)
Health or medical paid work	39	(10%)	38	(11%)
Health or medical internships	29	(8%)	27	(8%)
Other	30	(8%)	30	(9%)
Plan to have a career in health or medicine				
Yes	370	(96%)	327	(93%)
No	1	(0%)	2	(1%)
Missing	14	(4%)	22	(6%)
Intended Profession *				
Doctor (MD or DO)	282	(73%)	258	(74%)
Dentist	28	(7%)	24	(7%)
Registered Nurse	20	(5%)	18	(5%)
Public Health Professional	19	(5%)	16	(5%)
Researcher	14	(4%)	14	(4%)
Other	43	(11%)	47	(13%)
Undecided	8	(2%)	5	(1%)
Concerns in reaching career goals *				
Cost of education	325	(84%)	300	(85%)
Grades and/or difficulty of classes	223	(58%)	215	(61%)
Study skills	182	(47%)	180	(51%)
Time required for studying	129	(34%)	114	(32%)
Family or other social support	125	(32%)	104	(30%)
Years of required school and/or training	118	(31%)	112	(32%)
Personal motivation	93	(24%)	95	(27%)
Other	24	(6%)	22	(6%)
Resources to support career goals *				
Academic guidance	143	(37%)	143	(41%)
Mentoring	142	(37%)	136	(39%)
Peer support	134	(35%)	121	(34%)
Financial Counseling	128	(33%)	146	(42%)
Tutoring	119	(31%)	108	(31%)
Career counseling	118	(31%)	113	(32%)
Other	5	(1%)	3	(1%)
Interested in medically serving Hispanic and underserved communities [1]				
Yes	124	(93%)	125	(92%)
No	3	(2%)	9	(7%)
Neutral	7	(5%)	2	(1%)

** multiple responses permitted*

[1] percentages based on valid responses

Table 7 shows the baseline survey responses regarding conference information among IG and CG. Again, the IG and CG responses are very similar. Students in each group reported various methods for learning about the conference with the highest percentage learning from their college advisors or professors, or via word of mouth (17% for IG students and 14% for CG students). Approximately one-third of students reported that they attended the NHMA annual conference because of their interest in a health career; the vast majority were not members of NHMA at the time of survey completion.

Table 7. Student Baseline Surveys Years 1-4: Conference Information

	Intervention group (n= 385)		Control group (n =351)	
	n	(%)	n	(%)
Learned about conference through *				
College advisors/professors or word of mouth	64	(17%)	49	(14%)
School emails/Pre-health student organization	33	(9%)	36	(10%)
Posters/Flyers	27	(7%)	28	(8%)
Social media or website	24	(6%)	26	(7%)
Newsletters	9	(2%)	22	(6%)
Other	41	(11%)	48	(14%)
Motivation to attend NHMA conference				
Interest in health career	112	(29%)	115	(33%)
Learn/network with those from similar back	24	(6%)	24	(7%)
Suggested by school/pre-health program/academic advisor	11	(3%)	18	(5%)
Other	31	(8%)	25	(7%)
Member of NHMA [1]				
Yes	10	(6%)	4	(3%)
No	149	(94%)	148	(97%)

** Multiple responses permitted*

[1] percentages based on valid responses

Annual Surveys –Students

Table 8 shows IG and CG student demographics, academics, and professional interests as reported in the final annual survey (year 4). Approximately half of all students who completed the survey were juniors (52% of IG and 47% of CG students). Forty-two percent of CG students reported a current overall GPA of A+/A/A- compared to 32% of IG students, while 63% of IG students reported an overall GPA of B+/B/B- compared to 56% of CG students. The most effective study techniques used by both IG and CG students were reviewing class notes, reviewing class textbooks, and utilizing office hours with teaching assistants or professors. Sixty-six percent of IG students found study groups effective and 65% of IG students found tutoring to be helpful. Consistent with the baseline, all participants planned to have a career in

medicine or health, with most reporting that they intended to become doctors (77% of IG and 73% of CG students).

The most frequently noted challenge experienced by IG and CG students was finding relevant work or internships (65% of IG and 73% of CG students). The other most frequently noted challenges that students reported include difficulties succeeding in science/math classes (64% IG and 50% CG), balancing a job along with schoolwork (63% IG and 52% CG), balancing family expectations and schoolwork (59% IG and 55% CG), and inadequate funds for educational needs (52% IG and 58% CG). Resources most commonly noted as having been helpful—or would have been helpful—for both IG and CG students were financial aid/scholarship opportunities, work/internships (including information on work/internships, a mentor, and tips for succeeding in math/science classes.

Table 8. Student Annual Survey Year 4: Demographic, Academic and Professional Interests

	Intervention group (n= 122)		Control group (n =66)	
	n	(%)	n	(%)
Year in School				
Freshman	1	(1%)	0	(0%)
Sophomore	41	(34%)	25	(38%)
Junior	64	(52%)	31	(47%)
Senior	16	(13%)	8	(12%)
Missing	0	(0%)	2	(3%)
Current overall GPA				
A+ /A/ A-	39	(32%)	28	(42%)
B+/B/B-	77	(63%)	37	(56%)
C+/C/C-	5	(4%)	1	(2%)
Missing	1	(1%)	0	(0%)
Courses completed with passing grade *				
Chemistry	104	(85%)	55	(83%)
Biology	100	(82%)	58	(88%)
Calculus	81	(66%)	44	(67%)
Organic Chemistry	58	(48%)	28	(42%)
Physics	38	(31%)	24	(36%)
Other science courses**	45	(37%)	15	(23%)
Effective techniques used to study for math & science classes *				
Reviewing class notes	111	(91%)	62	(94%)
Reviewing class textbooks	89	(73%)	50	(76%)
Utilizing office hours with TA/professors	86	(70%)	42	(64%)
Study groups	80	(66%)	34	(52%)
Tutoring	79	(65%)	30	(45%)
Outlining chapters from class textbooks	56	(46%)	24	(36%)
Online resources (e.g. videos)	8	(7%)	2	(3%)
Other	12	(10%)	4	(6%)

Table 8. Student Annual Survey Year 4: Demographic, Academic and Professional Interests (Cont.)				
	Intervention group (n= 122)		Control group (n =66)	
	n	(%)	n	(%)
Plan to have a career in health or medicine				
Yes	122	(100%)	66	(100%)
Intended Profession				
Doctor (MD or DO)	94	(77%)	48	(73%)
Dentist	7	(6%)	3	(5%)
Registered Nurse	5	(4%)	4	(6%)
Public Health Professional	4	(3%)	0	(0%)
Researcher	1	(1%)	0	(0%)
Other	7	(6%)	8	(12%)
Undecided	4	(3%)	3	(5%)
Effective techniques used to prepare for graduate school entrance exams *				
Test prep books	45	(37%)	26	(39%)
Test prep courses	25	(20%)	5	(8%)
Study groups	19	(16%)	14	(21%)
Online resources (e.g. videos)	2	(2%)	3	(5%)
Other	1	(1%)	0	(0%)
N/A; did not start prep for graduate school entrance exams	67	(55%)	35	(53%)
Challenges experienced as an undergraduate working towards a health/medicine career *				
Finding relevant work/internships	79	(65%)	48	(73%)
Difficulty succeeding in science/math classes	78	(64%)	33	(50%)
Balancing a job & schoolwork	77	(63%)	34	(52%)
Balancing family expectations & schoolwork	72	(59%)	36	(55%)
Inadequate funds for educational needs	63	(52%)	38	(58%)
Lack of a support system	22	(18%)	27	(41%)
Health/mental health	0	(0%)	3	(5%)
Other	3	(2%)	3	(5%)
Resources that have been helpful or would have been helpful working towards a health/medicine career *				
Resources on financial aid/scholarships opportunities	95	(78%)	48	(73%)
Resources on available work/internships	87	(71%)	50	(76%)
Information on how to look for relevant work/internships	84	(69%)	48	(73%)
A mentor who works in your health career of interest	76	(62%)	48	(73%)
Tips for succeeding in math/science classes	76	(62%)	39	(59%)
Access to peer study groups	62	(51%)	21	(32%)
Other	4	(3%)	3	(5%)

** Multiple responses permitted*

Table 9 shows IG student engagement and satisfaction with their mentoring experience based on the final (year 4) annual surveys. Most students connected with their mentor by email or text (80%); slightly less than half connected by video call (46%). Fifty-four percent of students connected with their mentor 1 to 4 times in the past semester or quarter. About three quarters (73%) of students used MentorNet prompts as a starting point for conversations with their mentors. Most students discussed academic preparation (89%) and topics related to personal development (87%). More than half (58%) of students reported discussing topics associated with financing their education.

A great majority of students (93%) liked their mentors and agreed or strongly agreed that they were a good match with their mentors (89%) and that their mentors were an important part of their academic and professional support networks (89%). Students also agreed or strongly agreed that their mentors had provided them with useful resources to succeed academically and/or professionally (84%) and that connecting with their mentors made them confident to achieve their career goals in health or medicine (87%). Sixty percent of students agreed or strongly agreed that participating in the CHSP helped them to succeed in math and science courses and that they were more interested in becoming a health care professional now, as compared to when they started the CHSP (83%).

Table 9. Student Annual Survey Year 4: Mentor-Mentee Engagement and Satisfaction (N =122)

	n	(%)
Method of connecting with mentor *		
Email or text	97	(80%)
Video call	56	(46%)
Phone call	54	(44%)
In person	4	(3%)
Number of times connected with mentor in last semester or quarter		
0 times	9	(7%)
1 to 4 times	66	(54%)
5 to 10 times	41	(34%)
11 or more times	2	(2%)
Missing	4	(3%)
Use MentorNet discussion prompts to start conversation		
Yes	89	(73%)
No	33	(27%)
MentorNet topics or strategies discussed with mentor*		
Academic preparation	108	(89%)
Personal development	106	(87%)
Financing your education	71	(58%)
Experienced the following issues with mentor *		
No issues	80	(66%)
Scheduling conflicts	23	(19%)
My mentor is unresponsive to outreach attempts (e.g., when I call, text or email them to connect)	12	(10%)
My mentor is in a different health career field than the one I am interested in	9	(7%)
My mentor and I do not share a similar background	7	(6%)
Other	3	(2%)

Table 9. Student Annual Survey Year 4: Mentor-Mentee Engagement and Satisfaction (N =122) (Cont.)		
	n	**(%)**
I like my mentor		
Strongly agree/Agree	114	(93%)
Strongly disagree/Disagree	4	(3%)
Missing	4	(3%)
My mentor and I are a good match		
Strongly agree/Agree	108	(89%)
Strongly disagree/Disagree	10	(8%)
Missing	4	(3%)
My mentor is an important part of my academic & professional support network		
Strongly agree/Agree	108	(89%)
Strongly disagree/Disagree	10	(8%)
Missing	4	(3%)
Participating in the CHSP has helped me succeed in my math and science courses		
Strongly agree/Agree	73	(60%)
Strongly disagree/Disagree	43	(35%)
Missing	6	(5%)
My mentor has provided me with useful resources to help me succeed academically and/or professionally		
Strongly agree/Agree	103	(84%)
Strongly disagree/Disagree	14	(11%)
Missing	5	(4%)
Connecting with my mentor has made me more confident that I can achieve my goal of having a career in health or medicine		
Strongly agree/Agree	106	(87%)
Strongly disagree/Disagree	11	(9%)
Missing	5	(4%)
I am more interested in becoming a health care professional now, as compared to when I started the CHSP		
Strongly agree/Agree	101	(83%)
Strongly disagree/Disagree	17	(14%)
Missing	4	(3%)
The CHSP has increased my interest in becoming a healthcare professional		
Strongly agree/Agree	106	(87%)
Strongly disagree/Disagree	12	(10%)
Missing	4	(3%)
Other mentors, in addition to my CHSP mentor *		
Older student	47	(39%)
Professor	45	(37%)
College administrator	31	(25%)
Family member	27	(22%)
Other personal connection	27	(22%)
I do not have other mentors	29	(24%)

** Multiple responses permitted*

College Transcript Data

Table 10. CHSP Student Unofficial Transcripts Years 1-4: Science/Math Courses Completed and Overall GPA				
	Intervention group (n= 198)		Control group (n =111)	
	n	(%)	n	(%)
Science and Math Courses Completed with Passing Grade [1] *				
Biology	120	61%	55	50%
Chemistry	116	59%	64	58%
Organic Chemistry	84	42%	42	38%
Calculus	72	36%	33	30%
Physics	65	33%	43	39%
Last Submitted Overall GPA				
3.5 to 4.0	114	58%	64	58%
3.0 to 3.49	59	30%	30	27%
2.5 to 2.99	18	9%	5	5%
2.1 to 2.49	2	1%	1	1%
2.0 and below	1	1%	0	0%

[1] Passing indicates receiving a grade of C or above

** multiple responses permitted*

One hundred and ninety-eight IG students and 111 CG students submitted unofficial transcripts to NHMA in years 1-4. Submissions were from students who had been in the program for various amounts of time, ranging from one to four years. The percentages of students who received a passing grade (i.e., receiving a C grade or above) were slightly higher among IG students for all reported math and science courses except for Physics (33% for IG compared to 39% for CG). The greatest differences in passing grades reported by IG and CG students was in Biology (61% IG and 50% CG students), followed by Calculus (36% of IG and 30% CG) and Organic Chemistry (42% of IG and 38% CG students). Students also reported completing and passing the following science courses: Anatomy & Physiology, Ecology, Health Psychology, Medical Anthropology, Neuroscience, Nutrition, Pathophysiology, Pharmacology, Psychology, and Statistics.

Overall, IG students reported higher passing grades for their science and math classes via year 1-4 unofficial transcripts. The results of the two-sample t-test with equal variances showed that there were no statistically significant differences between the IG and CG students in overall GPA; the average overall GPA of CG students was 3.57 as compared to 3.49 among IG students. Using the Mann Whitney U Test, there were no statistically significant differences between the IG and CG students in categorized overall GPA.

Matriculation Surveys

Table 11 shows the post-college graduate study plans and GPAs of IG and CG seniors and recent graduates as reported in the Matriculation Survey. The sample size for the Matriculation Survey was relatively small (n=36, including 23 IG and 13 CG). Most respondents (n=21) were college seniors. Nine IG and 3 CG students had applied to a post-college graduate study program: 5 IG students and 1 CG had been accepted and enrolled. Consistent with the unofficial transcript data presented in Table 10, the mean GPAs for IG and CG students were approximately 3.5.

Table 11: Matriculation Survey				
	Intervention group (N= 23)		Control group (N= 13)	
	n	%	n	%
Year graduated from college				
2019	3	13%	0	0%
2020	1	4%	1	8%
2021	8	35%	2	15%
I am currently a college senior	11	48%	10	77%
Applied to post-college graduate study program				
Yes	9	39%	3	23%
No	14	61%	10	77%
Heard back from programs applied to [1]	**(n=9)**		**(n=3)**	
Yes, I was accepted and have enrolled	5	56%	1	33%
Yes, I was accepted but have not enrolled	2	22%	0	0%
I have not heard back yet	1	11%	1	33%
Currently applying/reapplying	1	11%	1	33%
Of college students who did not apply to post-college program and intend to apply [2]	**(n=14)**		**(n=10)**	
Yes, I plan to apply to a graduate study program next year (2022)	7	50%	9	90%
Yes, I plan to apply to a graduate study program in the future (2023 or after)	6	43%	1	10%
Other	1	7%	0	0%
Type of post-college graduate study program students intends on applying to * [2]	**(n=14)**		**(n=10)**	
Medical (MD or DO)	10	71%	9	90%
Public Health (MPH)	4	29%	0	0%
Research (Doctorate or PhD program)	1	7%	2	20%
Dental	1	7%	0	0%
Current overall GPA as a senior	**(n=11)**		**(n=10)**	
A+/A/A-	7	64%	6	60%
B+/B/B-	4	36%	4	40%
Mean current overall GPA (SE)	3.53 (0.133)		3.58 (0.071)	
Final overall GPA as a recent graduate	**(n=12)**		**(n=3)**	
A+/A/A-	7	58.3%	1	33%
B+/B/B-	5	41.7%	2	67%
Mean final overall GPA (SE)	3.54 (0.081)		3.56 (0.163)	

** multiple responses permitted*

[1] *percentages based on number of respondents who applied to post-college graduate study program*

[2] *percentages based on number of respondents who did not apply to post-college graduate study*

End of Program Surveys

Table 12 shows the academic and career interests of IG and CG students as reported in the End of Program Survey. More than three quarters of IG students (80%) were either juniors or seniors in college, as compared to 67% of CG students, who were more likely to have already graduated (15% of CG students, compared to 8% of IG). All students reported that they planned to have a career in health or medicine. Three quarters of IG students and 71% of CG students intended to be doctors. Other intended health professions that IG students reported were anesthesiologist assistant, occupational therapist, physician assistant, and respiratory therapist. Other intended professions that CG students reported were nurse practitioner, physician assistant, and pharmacist. CG students tended to have higher grades than IG students in calculus and physics courses. In this survey, 41% of IG students reported a current overall GPA of A+/A/A- compared to 44% of CG students. These findings were consistent with the year 4 Annual Survey data which showed a current average grade of A+/A/A- for 42% of the IG students but only 32% of CG students. In contrast, unofficial transcript submissions from years 1-4 showed 58% of IG students and 58% of CG students had an overall GPA of 3.5, indicating the self-reported grades were slightly lower in both groups compared to their submitted transcripts. All seniors planned to continue studies after college, with most intending to apply to medical programs (73% of IG seniors and 73% of CG seniors). Sixty-five percent of IG students and half of CG students had a mentor outside of the CHSP program—most commonly academic advisors, or other faculty members.

Table 12. Student End of Program Survey: Academic and Career Interests				
	Intervention Group (N= 85)		Control Group (N= 48)	
	n	%	n	%
Year in School				
Sophomore	10	(12%)	9	(19%)
Junior	27	(32%)	17	(35%)
Senior	41	(48%)	15	(31%)
I graduated from college	7	(8%)	7	(15%)
Year joined CHSP				
2018	5	(6%)	9	(19%)
2019	31	(36%)	21	(44%)
2020	24	(28%)	17	(35%)
2021	25	(29%)	1	(2%)
Plan to have a career in health or medicine				
Yes	85	(100%)	48	(100%)
Intended Profession *				
Doctor (MD or DO)	64	(75%)	34	(71%)
Dentist	6	(7%)	0	(0%)
Registered Nurse	3	(4%)	0	(0%)
Public Health Professional	3	(4%)	3	(6%)
Researcher	2	(2%)	1	(2%)
Other	4	(5%)	9	(19%)
Undecided	3	(4%)	1	(2%)
Final course grades [1]				
Biology				
A+/A/A-	46	(61%)	28	(60%)
B+/B/B-	22	(29%)	16	(34%)
C+/C/C-	6	(8%)	3	(6%)
D+/D/D-	1	(1%)	0	(0%)
Chemistry				
A+/A/A-	38	(53%)	24	(50%)
B+/B/B-	27	(38%)	20	(42%)
C+/C/C-	7	(10%)	4	(8%)
Calculus				
A+/A/A-	37	(60%)	33	(72%)
B+/B/B-	20	(32%)	11	(24%)
C+/C/C-	5	(8%)	2	(4%)
Organic Chemistry				
A+/A/A-	27	(49%)	20	(50%)
B+/B/B-	22	(40%)	11	(28%)
C+/C/C-	5	(9%)	8	(20%)
D+/D/D-	1	(2%)	1	(3%)
Physics				
A+/A/A-	25	(56%)	28	(70%)
B+/B/B-	15	(33%)	10	(25%)
C+/C/C-	5	(11%)	2	(5%)

Table 12. Student End of Program Survey: Academic and Career Interests (Cont.)				
	Intervention Group (N= 85)		Control Group (N= 48)	
	n	%	n	%
Current overall GPA [2]				
A+ /A/ A-	32	(41%)	18	(44%)
B+/B/B-	41	(53%)	21	(51%)
C+/C/C-	4	(5%)	2	(5%)
Missing	1	(1%)	0	(0%)
Final overall GPA when graduated college [3]				
A+ /A/ A-	1	(14%)	3	(43%)
B+/B/B-	6	(86%)	4	(57%)
Seniors who plan to continue studies after college [4]	41	(100%)	15	(100%)
Medical (MD or DO)	30	(73%)	11	(73%)
Dental	3	(7%)	0	(0%)
Public Health (MPH)	2	(5%)	2	(13%)
Nursing (RN or NP)	1	(2%)	1	(7%)
Research (Doctorate or PhD program)	1	(2%)	0	(0%)
Other	4	(10%)	1	(7%)
Seniors who have already applied for post-college studies [4]				
Yes	6	(15%)	1	(7%)
Yes, I was accepted and have enrolled	3	(50%)	0	(0%)
I am in the interview process or waiting to hear back	3	(50%)	1	(7%)
No	35	(85%)	14	(93%)
Have a mentor during time in college (for intervention group students - have a mentor outside of CHSP)				
Yes *	55	(65%)	24	(50%)
Academic advisor	35	(64%)	16	(67%)
Other faculty member	25	(45%)	7	(29%)
Family member or friend	13	(24%)	6	(25%)
Employer (current/previous)	8	(15%)	2	(8%)
Other	8	(15%)	6	(25%)
No	30	(35%)	24	(50%)

[1] *percentages based on number of students who reported having completed the indicated course*

[2] *percentages based on number of students who reported currently being in college*

[3] *percentages based on number of students who reported that they graduated from college*

[4] *percentages based on number of students who indicated being a senior in college*

** multiple responses permitted*

Table 13 shows the mentoring experience of IG students as reported in the End of Program survey. Most students indicated that career interest (92%), race/ethnicity (59%), and first in family to attend college (47%) were the most important characteristics to have in common with their mentors. More than three quarters (79%) of students had connected with their mentors in the last three months, and 60% of students had engaged with their mentor approximately once per month in the past year. About three quarters (74%) of students indicated that they had a very strong/strong connection with their mentors. The most useful study approaches recommended by mentors were reviewing class notes (90%), engaging with teaching assistants or tutors (88%), and reviewing past exams (87%). Most students (88%) were very satisfied/satisfied with the relationship that they had with the CHSP mentor.

More than half of students indicated that CHSP mentoring significantly increased knowledge about accessing resources needed to achieve personal and professional goals (59%) and significantly increased self-confidence (61%). Forty-six percent of students felt that CHSP mentoring significantly increased awareness of financing post-college education, 35% felt that mentoring only slightly increased awareness and 19% said that mentoring had no impact on their awareness of financing their post-college education. CHSP mentoring significantly improved or improved student skills in preparation of applications for post-college study (77%), communicating in a professional context (76%), navigating schooling and family life demands (75%), and networking (74%). The topics that students indicated not discussing with their mentors were budgeting (37%), test-taking (28%), and time management (26%).

Table 13. Student End of Program Survey: Mentoring Experience		
	Intervention Group (N= 85)	
	n	%
Characteristics important to have in common with mentor *		
Career interest	78	(92%)
Race/ethnicity	50	(59%)
First in family to attend college	40	(47%)
Gender	22	(26%)
Geographic region	18	(21%)
Other	2	(2%)
Characteristics I share/shared with my mentor *		
Career interest	71	(84%)
Race/ethnicity	60	(71%)
Gender	51	(60%)
First in family to attend college	36	(42%)
Geographic region	25	(29%)
Other	1	(1%)
Connected with mentor in last 3 months		
Yes	67	(79%)
Frequency of engagement with mentor in the past year		
Approximately two or more times per month	10	(12%)
Approximately once per month	51	(60%)
Less than once per month	8	(9%)
Never	0	(0%)
Missing	18	(21%)
Time spent each month communicating with mentor in the last year		
Less than an hour	10	(12%)
1-2 hours	37	(44%)
2.5 - 4 hours	12	(14%)
More than 4 hours	16	(19%)
None	3	(4%)
Not sure/Missing	7	(8%)
Strength of connection with mentor		
Very strong/ Strong	63	(74%)
Mentor recommended approaches for studying *		
Engage with teaching assistants or tutors	57	(67%)
Participate in study groups	48	(56%)
Review class notes	46	(54%)
Review books	45	(53%)
Review past exams	43	(51%)
No, my mentor did not recommend approaches for studying	15	(18%)
Other	4	(5%)
Usefulness of study approaches recommended by mentor [1]		
Review class notes		
Very useful/Useful	57	(90%)
Engage with teaching assistants or tutors		
Very useful/Useful	60	(88%)
Review past exams		
Very useful/Useful	55	(87%)
Participate in study groups		
Very useful/Useful	53	(85%)
Review books		
Very useful/Useful	49	(79%)

Table 13. Student End of Program Survey: Mentoring Experience (Cont.)		
	Intervention Group (N= 85)	
	n	%
Satisfaction with relationship with CHSP mentor		
Very satisfied/Satisfied	75	(88%)
CHSP mentoring increased my knowledge about how to access the resources needed to achieve my personal and professional goals		
Significantly increased my knowledge	50	(59%)
Slightly increased my knowledge	27	(32%)
Had no impact on my knowledge	8	(9%)
CHSP mentoring increased my level of self-confidence to achieve personal and professional career goals		
Significantly increased my self-confidence	52	(61%)
Slightly increased my self-confidence	25	(29%)
Had no impact on my self-confidence	8	(9%)
CHSP mentoring increased my awareness about how to finance my post-college education		
Significantly increased my awareness	39	(46%)
Slightly increased my awareness	30	(35%)
Had no impact on my awareness	16	(19%)
CHSP mentoring improved my skills in the following areas … [2]		
Study habits		
Significantly improved/Improved	57	(68%)
Time management		
Significantly improved/Improved	56	(67%)
Budgeting		
Significantly improved/Improved	44	(52%)
Preparation of applications for post-college study		
Significantly improved/Improved	65	(77%)
Test-taking		
Significantly improved/Improved	53	(64%)
Communicating in a professional context		
Significantly improved/Improved	65	(76%)
Finding available internship opportunities		
Significantly improved/Improved	60	(71%)
Networking		
Significantly improved/Improved	63	(74%)
Navigating schooling & family life demands		
Significantly improved/Improved	64	(75%)

** multiple responses permitted*

[1] percentages based on number of students who rated the usefulness of the indicated study approach

[2] percentages based on number of students who rated improvement of skills in the indicated area

Table 14 shows students' experiences with webinars and discussion prompts, as reported in the End of Program Survey. Most students (80%) reported watching 2-4 webinars per year. Sixty-one percent of students most often watched webinars live. Webinars with the highest attendance were "Financing your Academic Journey" (58%), "Nontraditional Pathways to a Health Professional School" (58%), and "The Federal Government, U.S. Healthcare System, & Medicare & Medicaid Advantage" (39%). More than half (56%) of students said that they had used information learned in the webinars.

Forty-four percent of students used MentorNet discussion prompts when connecting with their mentor every time/most of the time and a quarter used the prompts some of the time. This was consistent with the year 4 annual survey results, in which 73% of students used MentorNet discussion prompts to start conversations with their mentors. Most students (85%) found the MentorNet discussion topics to be very useful or useful. They felt that discussion prompts addressed the challenges experienced by pre-health students who are first-generation in college and/or students of color (91%). Most students (87%) did not feel topics were missing from the discussion prompts. Of those who felt there were missing topics, recommendations included: sexism and racism in medicine, including microaggressions; navigating mental health as a pre-health student, including imposter syndrome and burnout; and the basics of preparing for the MCAT.

Table 14: Student End of Program Survey: Experience with NHMA Webinars and Discussion Prompts

	Intervention Group (N= 85)	
	n	%
Average frequency of watching the webinars		
Approximately 4x per year	31	(36%)
Approximately 2-3x per year	37	(44%)
Approximately once per year	15	(18%)
I have never watched a NHMA CHSP webinar	2	(2%)
Most often watch webinars live or recorded		
Watched webinars live	52	(61%)
Watched recorded webinars	33	(39%)
Webinars attended *		
Financing your Academic Journey	49	(58%)
Nontraditional Pathways to a Health Professional School	49	(58%)
The Federal Govt. & the U.S. Healthcare System, & Medicare & Medicaid Advantage	33	(39%)
The American Healthcare System: Essential Hospitals & the Insurance Marketplace	30	(35%)
The Social Determinants of Health & Graduate School / Health Professional School Interview Skills	28	(33%)
Hispanic Health & Social Determinants of Health	22	(26%)
Graduate School Admission Tips	20	(24%)
Latino Leadership in Healthcare Research & Science	17	(20%)
Achieving Health Equity through Federal Initiatives	15	(18%)
Health Equity Policies through Federal Initiatives	10	(12%)
National CLAS Standards and Hispanic and Immigrant Health	7	(8%)
Used information learned in the webinars		
Yes	48	(56%)
No	37	(44%)

Table 14: Student End of Program Survey: Experience with NHMA Webinars and Discussion Prompts (Cont.)		
	Intervention Group (N= 85)	
	n	%
Used MentorNet discussion prompts when connecting with mentor		
Every time/Most of the time	37	(44%)
Some of the time	21	(25%)
Never	12	(14%)
Only when they are applicable to what was happening in my life at the time of discussion	15	(18%)
Usefulness of the MentorNet discussion topics		
Very useful/Useful	72	(85%)
Not very useful/ Not useful at all	12	(14%)
Missing	1	(1%)
Discussion prompts address the challenges experienced by pre-health students who are first-generation in college and/or students of color …		
Very well/Somewhat well	77	(91%)
Not very well/Not well at all	6	(7%)
Missing	2	(2%)
Topics are missing from discussion prompts		
No	74	(87%)
Yes	7	(8%)
Missing	4	(5%)

** multiple responses permitted*

Table 15 shows students' experiences with the private virtual student group, as reported in the End of Program Survey. About half of the students (49%) had participated in the private student group. Of the students who did not participate, the most common reasons were that they did not know about this resource (49%), knew about the resource but forgot how to access it (26%), and lack of time (23%). Of students who did participate, half (50%) visited once a month, and most (86%) found it very easy/easy to access and navigate. Eighty-three percent of students found the student group to be useful or extremely useful. The most commonly reported impacts of engaging with the online group were feeling like they were part of a larger community of pre-health students (57%), provided useful resources (48%), and was an opportunity to meet other students with common interests (40%).

Table 15. Student End of Program Survey: Private Virtual Student Group Experience		
	Intervention Group (N= 85)	
	n	%
Visited the private virtual student group, HispanicHealth.info		
No	43	(51%)
Yes	42	(49%)
Reasons for not visiting virtual group * [1]		
Did not know about this resource	21	(49%)
Knew about this resource but forgot how to access it	11	(26%)
Lack of time	10	(23%)
Issues with account or login	2	(5%)
Lack of interest in this type of resource	1	(2%)
Other	2	(5%)
Frequency of visiting the private virtual student group [2]		
A few times per month	2	(5%)
Once per month	21	(50%)
Less than once per month	19	(45%)
Access and navigation of the private virtual student group is ... [2]		
Very easy/Easy	36	(86%)
Somewhat difficult/Very difficult	6	(14%)
Ways of engaging in the virtual group [2]		
I read other students' posts	36	(86%)
I post questions, comments or resources for other students	14	(33%)
I respond to others' posts	13	(31%)
Usefulness of virtual group [2]		
Extremely useful/Useful	35	(83%)
Not very useful/ Not useful at all	7	(17%)
Impact of private virtual student group * [2]		
Made me feel part of a larger community of pre-health students	24	(57%)
Provided useful resources	20	(48%)
Opportunity to meet other students with common interests	17	(40%)
Answered questions I had	11	(26%)
Helped me to solve problems I was experiencing	6	(14%)
No impact	7	(17%)

** multiple responses permitted*

[1] percentages based on number of students who indicated that they did not visit the private virtual student group

[2] percentages based on number of students who reported visting the private virtual student group

Table 16 shows IG and CG students experiences with the NHMA website as reported in the End of Program Survey. Most students visited the NHMA website (91% of IG students and 81% of CG students). The most common reasons for visiting the NHMA website for both IG and CG students were to learn about NHMA, learn about CHSP, and find resources. Twenty-nine percent of CG students reported visiting and using the NHMA website resources page, compared to 22% of IG students. Most students found the NHMA resources pages very useful/useful (95% of IG students compared to 100% of CG students). Of the students who did not visit the NHMA resources page, more than half (66%) of IG students reported that they did not know about the page existed.

Table 16. Student End of Program Survey: Experience with NHMA website

	Intervention Group (N= 85)		Control Group (N= 48)	
	n	%	n	%
Visited the NHMA website				
Yes	77	(91%)	39	(81%)
No	8	(9%)	9	(19%)
Of students who visited the NHMA website, reasons for visiting *				
Learn about NHMA	59	(69%)	23	(48%)
Learn about the CHSP	46	(54%)	20	(42%)
Find resources	38	(45%)	20	(42%)
Learn about the annual conference	21	(25%)	6	(13%)
Other	0	(0%)	1	(2%)
Frequency of visiting the NHMA website				
A few times per week	1	(1%)	1	(2%)
A few times per month	10	(12%)	4	(8%)
Approximately once per month	19	(22%)	10	(21%)
Less than once per month	46	(54%)	22	(46%)
Missing	9	(11%)	11	(23%)
Visted and used the NHMA website resources page				
Yes	19	(22%)	14	(29%)
No	58	(68%)	23	(48%)
Missing	8	(9%)	11	(23%)
Usefulness of NHMA's resources page [1]				
Very useful/Useful	18	(95%)	14	(100%)
Not very useful/ Not useful at all	1	(5%)	0	(0%)
Reasons for not using available resources on NHMA website [2] *				
I did not know they were there	38	(66%)	0	(0%)
I already had the resources I needed	14	(24%)	0	(0%)
I did not find them to be useful	6	(10%)	0	(0%)

[1] percentages based on number of students who reported having visited and used NHMA's resources page

[2] percentages based on number of students who reported not visiting the NHMA website resources page

** multiple responses permitted*

Table 17 shows CG students' experiences with the pre-health conferences as reported in the End of Program Survey. Thirty-one percent of CG students had attended a NHMA CHSP pre-health conference and most (87%) found it to be very useful/useful. The most commonly reported impacts of attending a pre-health conference were strengthened belief that students could apply and get into a graduate health professional school (47%), increased understanding of how to apply to graduate health professional schools (47%), and increased awareness of resources available to pre-health college students who are Hispanic/Latinx and/or students of color (40%). Of students who indicated that they had never attended a pre-health conference, the most common reasons were because of scheduling conflicts or lack of time (47%) and lack of available funds to attend (33%).

Table 17. Student End of Program Survey: Experience with Pre-health conferences

	Control Group (N= 48)	
	n	**%**
Attended any NHMA CHSP Pre-Health Conferences		
Yes	15	(31%)
No	31	(65%)
Missing	2	(4%)
Usefulness of NHMA CHSP Pre-Health Conference [1]		
Very useful/Useful	13	(87%)
Not very useful/ Not useful at all	0	(0%)
Missing	2	(13%)
Reasons for not attending a conference [2] *		
Scheduling conflict or lack of time	7	(47%)
Lack of available funds to attend	5	(33%)
Did not know about the conference	1	(7%)
Not interested in attending	1	(7%)
Impact of attending pre-health conference *		
Strengthened my belief that I can apply to and get into a graduate health professional school	7	(47%)
Increased my understanding of how to apply to graduate health professional schools	7	(47%)
Increased my awareness about available resources for pre-health college Latinx students and/or students of color	6	(40%)
I learned about the National Hispanic Medical Association and its CHSP	5	(33%)
Increased my interest in a graduate health professional school	5	(33%)
I was able to network with healthcare professionals	2	(13%)
I made lasting connections with other students interested in health careers	2	(13%)

[1] percentages based on number of students who reported attending a Pre-Health Conference

[2] percentages based on number of students who reported not attending a Pre-health Conference

** multiple responses permitted*

Table 18 shows student and mentor perceptions of the CHSP as reported in the End of Program Survey. Approximately two-thirds of students and mentors strongly agreed or agreed that they knew how to access the different resources offered through CHSP. Most students also knew who to contact if they had an issue in CHSP (83% of mentors and 79% of students and knew what they were expected to do as part of the CHSP (90% of mentors and 84% of students). Eighty percent of students and 90% of mentors felt that the amount of communication from NHMA CHSP had been “just right.” Students indicated that calendar invites sent directly to email (55%) and reminder emails (55%) would help them to stay informed about CHSP webinars and other program activities. In contrast, mentors had a stronger preference for reminder emails (71%). Most IG students (93%) found the conference speakers, the website, and other students motivating and 68% indicated that they studied more because of this motivation.

Table 18. Student and Mentor End of Program Surveys: Perceptions of CHSP				
	Intervention Group (N= 85)		Mentors (N= 42)	
	n	%	n	%
Agree with the following statements …				
I know how to access the different resources offered through the CHSP				
Strongly agree/Agree	58	(68%)	28	(67%)
Disagree/Strongly disagree	21	(25%)	13	(31%)
Not applicable/Missing	6	(7%)	1	(2%)
I know who to contact if I am having an issue in the CHSP				
Strongly agree/Agree	67	(79%)	35	(83%)
Disagree/Strongly disagree	14	(16%)	7	(17%)
Not applicable/Missing	4	(5%)	0	(0%)
I know what I am expected to do as part of the CHSP				
Strongly agree/Agree	71	(84%)	38	(90%)
Disagree/Strongly disagree	10	(12%)	4	(10%)
Not applicable/Missing	4	(5%)	0	(0%)
I know how to find the schedule for CHSP webinars				
Strongly agree/Agree	50	(59%)	N/A	
Disagree/Strongly disagree	30	(35%)	N/A	
Not applicable/Missing	5	(6%)	N/A	
The amount of communication from NHMA CHSP staff has been just right				
Strongly agree/Agree	68	(80%)	38	(90%)
Disagree/Strongly disagree	12	(14%)	4	(10%)
Not applicable/Missing	5	(6%)	0	(0%)
Methods that would make it easier to stay informed about the CHSP webinars and other program activities *				
Calendar invites sent directly to email address	47	(55%)	20	(48%)
Reminder emails of all upcoming events for the next month	47	(55%)	30	(71%)
An online hub that shows all upcoming events	25	(29%)	14	(33%)
Found the conference speakers, website and other students motivating to prepare to go onto graduate health professional school				
Yes	79	(93%)	N/A	
Studied more because of this motivation	54	(68%)	N/A	
Did not study more because of this motivation	25	(32%)	N/A	
No	5	(6%)	N/A	
Missing	1	(1%)	N/A	

** multiple responses permitted*

Table 19 shows IG and CG students' experiences with the NHMA CHSP as reported in the End of Program Survey. Eighty-nine percent of IG students felt NHMA addressed academic preparation very well/well as compared to 79% of CG students. Eighty-nine percent of IG

students felt NHMA addressed finances very well/well as compared to 73% of CG students and 86% of IG students indicated that NHMA addressed personal/professional development very well/well compared to 77% of CG students.

IG students tended to have higher agreement for being better prepared to apply to graduate health professional school because of the CHSP (88% for IG students and 73% for CG students), more confidence to do well in graduate school because of the CHSP (86% for IG students and 71% for CG students) and having a larger support network (82% for IG students and 67% for CG students). Most IG and CG students would recommend CHSP to other pre-health college students (96% for IG students and 90% for CG students).

Table 19. Student End of Program Survey: Experience with NHMA CHSP				
	Intervention Group (N= 85)		Control Group (N= 48)	
	n	%	n	%
How well did NHMA CHSP address the following areas …				
Academic preparation				
Very well/Well	76	(89%)	38	(79%)
Not very well/Not well at all	8	(9%)	5	(10%)
Missing	1	(1%)	5	(10%)
Finances				
Very well/Well	76	(89%)	35	(73%)
Not very well/Not well at all	8	(9%)	8	(17%)
Missing	1	(1%)	5	(10%)
Personal/Professional development				
Very well/Well	73	(86%)	37	(77%)
Not very well/Not well at all	11	(13%)	6	(13%)
Missing	1	(1%)	5	(10%)
Agree with the following statements …				
I am better prepared to apply to a graduate health professional school because of the CHSP				
Strongly agree/Agree	75	(88%)	35	(73%)
Disagree/Strongly disagree	8	(9%)	9	(19%)
Missing	2	(2%)	4	(8%)
I am more confident that I can do well in a graduate health professional school because of the CHSP				
Strongly agree/Agree	73	(86%)	34	(71%)
Disagree/Strongly disagree	10	(12%)	10	(21%)
Missing	2	(2%)	4	(8%)
I am more confident that I can achieve my personal and professional goals because of the CHSP				
Strongly agree/Agree	75	(88%)	N/A	
Disagree/Strongly disagree	8	(9%)	N/A	
Missing	2	(2%)	N/A	
I have a larger support network because of the CHSP (for CG students: NHMA conference and CHSP resources)				
Strongly agree/Agree	70	(82%)	32	(67%)
Disagree/Strongly disagree	13	(15%)	12	(25%)
Missing	2	(2%)	4	(8%)
I would recommend CHSP to other pre-health college students				
Yes	82	(96%)	43	(90%)
No	2	(2%)	1	(2%)
Missing	1	(1%)	4	(8%)

Table 20 shows mentor career and mentoring experience as reported in the End of Program Survey. About three quarters (74%) of mentors were, or intended to be, doctors, and 17% were or intended to be dentists. Most mentors (98%) had connected with their mentee in the last

three months through email or text (90%) and video calls (67%). Two-thirds of mentors (67%) engaged with mentees approximately once per month in the last 3 months and 67% spent about 1-2 hours each month communicating with mentees in the last year. Most mentors (83%) reported a very strong/strong connection with their mentees.

Table 20. Mentor End of Program Survey: Career and Mentoring Experience (N=42)

	n	%
Current or intended profession		
Doctor (MD or DO)	31	(74%)
Dentist	7	(17%)
MD-PhD	2	(5%)
Nurse Practitioner	1	(2%)
Public Health Professional	1	(2%)
Connected with mentee in the last 3 months		
Yes	41	(98%)
No	1	(2%)
Ways of connecting with mentee in the last 3 months *		
Email or text	38	(90%)
Video call	28	(67%)
Phone call	19	(45%)
In person	1	(2%)
Frequency of engagement with mentee in the last 3 months		
Approximately two or more times per month	6	(14%)
Approximately once per month	28	(67%)
Less than once per month	8	(19%)
Time spent each month communicating with mentee in the last year		
Less than an hour	3	(7%)
1-2 hours	28	(67%)
2.5 - 4 hours	4	(10%)
More than 4 hours	7	(17%)
Strength of connection with mentee		
Very strong/ Strong	35	(83%)
Not strong/Not strong at all	7	(17%)

** multiple responses permitted*

Table 21 shows mentor perceptions of NHMA program components as reported in the End of Program Survey. Most mentors (88%) reported using the MentorNet discussion prompts when connecting with mentees at least some of the time; approximately three-quarters (76%) found the discussion topics to be very useful/useful. The same proportion (76%) said that there were no topics missing from the discussion prompts. Among those that did feel there were missing prompts, recommendations reflected those suggested by IG students (see Table 14) and included: work-life balance; resiliency; internships and other opportunities; scholarships; writing personal statements; application timelines; and addressing imposter syndrome,

microaggressions in health care training and education, and systemic racism. More than three-quarters (79%) of mentors visited the NHMA website; the most common reasons for visiting were to learn more about NHMA (64%) and to look for resources (29%). Of those who visited the NHMA website, 70% of mentors visited less than once per month. About a third of mentors (36%) visited and used the NHMA website resources page and most found it to be very useful/useful (92%). Of mentors who did not visit and use the NHMA resources page, the main reasons were because they did not know the page was there (57%) and they already had the resources needed (43%).

Table 21. Mentor End of Program Survey: Perceptions of NHMA Program Components (N=42)		
	n	**%**
Used MentorNet discussion prompts when connecting with mentee		
Every time	5	(12%)
Most of the time	11	(26%)
Some of the time	21	(50%)
Never	2	(5%)
Only when they are applicable to what what was happening in my life at the time of discussion	3	(7%)
Usefulness of the MentorNet discussion topics		
Very useful/Useful	32	(76%)
Not very useful/ Not useful at all	10	(24%)
Discussion prompts address the challenges experienced by pre-health students who are first-generation in college and/or students of color …		
Very well/Somewhat well	42	(100%)
Topics are missing from discussion prompts		
No	32	(76%)
Yes	10	(24%)
Visited the NHMA website		
Yes	33	(79%)
No	9	(21%)
Of mentors who visited the NHMA website, reasons for visiting *		
I wanted to learn more about NHMA	27	(64%)
I was looking for resources	12	(29%)
I wanted information about the annual conference	9	(21%)
I wanted more information about the CHSP	9	(21%)
Frequency of visiting the NHMA website [1]		
A few times per month	3	(9%)
Approximately once per month	7	(21%)
Less than once per month	23	(70%)
Visted and used the NHMA website resources page [1]		
Yes	12	(36%)
No	21	(64%)
Usefulness of NHMA's resources page [2]		
Very useful/Useful	11	(92%)
Not very useful/ Not useful at all	1	(8%)
Reasons for not using available resources * [3]		
I did not know they were there	12	(57%)
I already had the resources I needed	9	(43%)
Time constraints	1	(5%)

** multiple responses permitted*

[1] percentages based on number of mentors who indicated visiting the NHMA website

[2] percentages based on number of mentors who indicated visiting the NHMA resources page

[3] percentages based on number of mentors who indicated not visiting the NHMA resources page

Table 22 shows mentor perceptions of the NHMA CHSP program as reported in the End of Program Survey. Most mentors felt that NHMA CHSP personal/professional development (90%), academic preparation (88%), and finance (83%) very well or well. Most mentors (98%) would recommend CHSP to other healthcare professionals.

Table 22. Mentor End of Program Survey: Perceptions of NHMA CHSP program (N=42)

	n	%
How well did NHMA CHSP address the following areas …		
Personal/Professional development		
Very well/Well	38	(90%)
Not very well/Not well at all	4	(10%)
Academic preparation		
Very well/Well	37	(88%)
Not very well/Not well at all	5	(12%)
Finances		
Very well/Well	35	(83%)
Not very well/Not well at all	7	(17%)
I would recommend CHSP to other healthcare professionals		
Yes	41	(98%)
No	1	(2%)

** multiple responses permitted*

QUALITATIVE FINDINGS

The findings presented below summarize findings from the qualitative component of evaluation (conducted during years two through four[5]) and detail student and mentor experiences and perspectives on each CHSP program component, as well as their perceptions of program impact and their recommendations. The emphasis is on year 4 results, as they have not been described in previous reports.

In total, NYAM conducted 4 focus groups and 24 interviews with a total of 51 individuals for the qualitative component of the CHSP evaluation. Table 23 below presents the demographic information from the brief questionnaires interview and focus group participants completed Forty-one percent of individuals who participated in a focus group or interview were 24 years of age or older, three-quarters (76%) were women, the majority identified as being Hispanic or Latinx (92%), and 57% reported Spanish as the main language spoken at home.

[5] Year one qualitative research was used for program planning rather than assessment so is not included here.

Table 23. Focus Group and Interview Participants: Demographic Characteristics												
	Year 2 IG FG (N=7)		Year 2 Mentor Interviews (N=5)		Year 3 IG & CG Interviews (N=19)		Year 4, Two IG FGs (N=14)		Year 4 Mentor FG (N=6)		Combined (N= 51)	
	N	%	N	%	N	%	N	%	N	%	N	%
Age												
18-20	3	43%	0	0%	8	42%	3	21%	0	0%	14	27%
21-23	2	29%	0	0%	7	37%	7	50%	0	0%	16	31%
24+	2	29%	5	100%	4	21%	4	29%	6	100%	21	41%
Gender												
Woman	4	57%	2	40%	15	79%	12	86%	6	100%	39	76%
Man	3	43%	3	60%	4	21%	2	14%	0	0%	12	24%
Prefer not to answer	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Race/Ethnicity*												
Hispanic/Latinx	7	100%	5	100%	17	89%	13	93%	5	83%	47	92%
Black/African American	0	0%	0	0%	2	11%	0	0%	0	0%	2	4%
White	0	0%	0	0%	0	0%	2	14%	2	33%	4	8%
Asian/Asian American	0	0%	1	20%	1	5%	0	0%	1	17%	3	6%
American Indian/Alaskan Native	0	0%	0	0%	0	0%	1	7%	0	0%	1	2%
Main Language Spoken at Home*												
Spanish	5	71%	3	60%	11	58%	8	57%	2	33%	29	57%
English	2	29%	2	40%	8	42%	4	29%	4	67%	20	39%
English and Spanish mix	0	0%	0	0%	0	0%	2	14%	0	0%	2	4%
Other	0	0%	0	0%	1	5%	0	0%	0	0%	1	2%

**multiple responses permitted*

MOTIVATION TO JOIN THE CHSP

Motivation for students to join the CHSP was consistent across years. Students saw CHSP as an opportunity to learn from individuals with similar backgrounds as themselves (e.g., first generation, Hispanic), who have achieved similar career goals. The program also offered a rare opportunity to receive mentorship from current healthcare professionals and an opportunity to travel to and attend the annual NHMA conference in Washington D.C.

> *I applied because I thought it was really cool that they pair you with someone that's already a healthcare professional. That was something unique that I hadn't seen in other mentorship programs. Or at least I hadn't found out about…that's why I applied. (Y4 IG FG)*

> *I don't really know many people in medicine or any people that really look like me in medicine, so I really wanted to enter this program to have a mentor that would guide me and has similar experiences as me. And, that has been really helpful, especially with applying to medical school, knowing exactly what to do to get there. (Y4 IG FG)*

Mentors described their reason for joining the CHSP as an opportunity to give back to the Hispanic community – those who themselves had mentors noted their importance, and those who never had a mentor described the challenges they faced as motivation for participating.

> *I feel like I was able to become a dentist through mentoring and support from other either dentists or just programs that kind of did something similar to NHMA. So, I just felt like it was something that I really wanted to do to give back in that way since that was what helped me get to the point where I am today. (Y4 Mentor FG)*

I really like giving back, and mentoring is really important to me because I always see what happens when a lot of people are like, "I have no idea what I'm doing. I didn't know this. And I wish" – they could've saved so much time if they just knew the right person who would tell them the right information. (Y4, Mentor FG)

ONBOARDING

Participants reported the onboarding process in Y4 as easy, despite the COVID-19 pandemic. The application process was clear, not overly burdensome, and did not feel exclusionary. The ease contrasts with the challenges described by students who joined the program earlier (2018-2019), suggesting that student feedback was used for program improvement.

It wasn't an extensive application process, so I didn't feel like they were trying to weed out people depending on how already skilled they were. I thought that was pretty cool, because a lot of things that are for mentoring or for anything like that, they kind of have more extensive applications in a sense that I feel like can exclude people that don't already have a leg up…And it was pretty straightforward, not too time intensive. (Y4, IG FG)

PROGRAM COMPONENTS

Private Online Student Group & Resources Webpage

Very few students or mentors were aware of the private online student group. Those who were aware, noted difficulty accessing the group, as it requires a separate set of login credentials. Both students and mentors appreciated its potential as a place for students and mentors to share their experiences and resources, assuming participation rates improve. Students who had visited the group responded to CHSP staff posts and shared notebook templates for others to use. Since receiving the feedback regarding access, NHMA has incorporated reminders regarding the group and how to access it into their regular email communications with CHSP participants.

I remember maybe like a month ago I wanted some interview tips for med school, because I had an interview coming up, but no one replied until like I think like a couple of weeks ago, but my interview has already passed and it's been a while. So, I think that just also maybe because the platform is not too user friendly then not a lot of people use it too frequently. So, then I didn't get a response when I needed it. (Y4, IG FG)

I remember last year during the pandemic they had a healthcare professional, actually a couple, share their experience and so I thought that was really cool. And also, [CHSP staff] asked questions on there [in the private virtual group] asking about general chemistry or organic, lab experiences. And I would just try to share, because I know when I was in undergrad – lower classman, it was helpful to see what older people were doing, how they got there. So, I shared those experiences [and also] a notebook

template for two people who had responded for just how to organize organic chemistry information. (Y4, IG FG)

Most students had visited the NHMA website, but few students reported visiting the NHMA resources webpage, consistent with student data collective in the End of Program Surveys (see Table 16). One student, directed from the SHPEP program, did however learn about the CHSP through the NHMA website. Since that time, NHMA has placed concerted effort on improving the utility and ease of navigation to incorporate more updated resources and offerings to students.

I'm looking at the website right now, and I've definitely been on this website before, but even looking at it as we speak, I can't tell where – like that group is supposed to be. I think the websites that NHMA uses could be a little more user-friendly just in general. (Y4, IG FG)

Quarterly Webinars

Webinar topics were perceived as useful, interesting, and relevant. Students particularly appreciated webinars that highlighted: 1) practitioners from similar backgrounds (e.g., Hispanic, first-generation) who shared their path to their current career; and those that 2) provided tangible tips (e.g., how to write a personal statement). Attending the quarterly webinars increased students' knowledge on the topic presented (e.g., healthcare system, health policy), even if they had previously been exposed to the topic in school. In particular, the social determinants of health webinar helped students make connections to their own life and validated their personal experiences, while providing approaches to support the Hispanic community. Webinars were also described as an opportunity for students to connect. Having stayed a few minutes after the webinar, a handful of students continued chatting and created their own study group for the MCAT. Described in largely positive terms, one of the few challenges, apart from scheduling conflicts that recorded lectures addressed, some presenters used jargon-heavy terminology. Using more accessible language was suggested to increase students engagement and understanding of these topics.

In terms of applying to med school, it has really helped me. And getting to get these speakers that are already done with their MD and kind of seeing how they're an example to follow, it has really made me want to pursue the field of medicine even more. Especially if they're bringing Latino speakers with an MD, I feel like that's really empowering and impactful. And it's not something that I get to see very often. (Y2, IG FG)

I think the webinar that I attended was that one that [presenter name] was talking about, Medicare and Medicaid, and the social determinants of health. I just sorta pulled back information that I had learned when I was earning my undergrad degree. It's interesting information. So, it definitely made me become a little bit more interested in the public health field. And then, also being a first-generation student to try and focus on the Hispanic community and what are ways that I can engage and that I can give back.

Especially, because I do live in New York, and I do live in an area where it's predominately Hispanics. So, yeah. It just made me wanna give more to my people. (Y4, IG, FG)

At the end, there was an option to stay afterwards to just meet people in the program and I remember it was a good time of people just relating, sharing, getting to know each other. And at the end, there was a GroupMe made or something for people wanting to study together for the MCAT. And so, it just happened so organically in a matter of ten to fifteen minutes. (Y4, IG FG)

The first one I attended it was on I think the government's role in healthcare. Something like that. Medicaid, Medicare, like the difference. And I was very interested in the information. It was a little over my head, so I think just keeping up with some of the terminology. I was just a little lost, but still – it opened my awareness to an area of medicine that I just was kind of oblivious to, so that was cool. (Y4, IG FG)

MentorNet Discussion Prompts

Students and mentors reported discussing a wide range of issues with each other and appreciated the MentorNet discussion prompts as useful starting points for topics they may not have thought to discuss. Often, the prompts were used if they felt relevant to the questions and issues that the student was experiencing at the time. Students were interested in prompts with more detailed probes on finances (e.g., what does it look like in practice to take out a loan or build up one's credit). Students were also interested in prompts addressing stress management approaches, how to deal with a setback, how to navigate higher education and graduate student program applications as an undocumented student and additional prompts discussing the challenges, in general, that underrepresented students face in college. Questions about "belonging" were also identified as important to include in the discussion prompts. Mentors requested seeing all the prompts at once, to allow them to select the prompts that seem most aligned with what their mentee is experiencing.

Talking about finances with my mentor is like, I feel like it's very vague. It's kind of like wave handy. Like, "Oh, so what did you do to pay?" "Oh, I took out loans. Make sure you build up your credit." And that's kind of it. There's not really much more.(Y4 IG FG)

I don't feel like there were a lot of prompts that really encouraged conversation about identity and belonging. I don't remember there being any outright question being like, "Do you feel like you belong at your university?" or, "Do you feel like you would belong in certain healthcare profession here?" So, I think explicitly asking those sorts of questions in the prompt might help and encourage that conversation, because I think it's hard to talk about identity. And it might be even more challenging to bring up to your mentor like, "Hey, I don't feel like this is – I don't feel like my university is a safe place for me. I feel like I don't fit in in any of my pre-med classes," or things like that. Might feel awkward to bring up to someone, unless you had the encouragement to do so. (Y4 Mentor FG)

Mentoring

Students and mentors described the main benefit of the CHSP as the personal connections between individuals with similar backgrounds and cultural contexts, providing opportunities to brainstorm, solve problems, share resources, and provide general guidance and validation based on personal experience. Students explained that without their CHSP mentors, they would experience a sense of loss, fear, and a lack of awareness about what to expect from graduate school. Mentors, similarly, wished they had had access to a program like CHSP when they were in college, noting how it would have increased their sense of belonging, as they pursued a career in medicine. Students also appreciated meeting peers with similar interests and backgrounds to themselves.

> *I think for me the value was just having that support group from someone who empathizes and already knows the same struggles and whatnot because even though race might not mean necessarily that you're gonna click, often in the case of minorities it means that you're gonna go through the same hurdles. So, to have somebody to speak to that has experienced similar things as me. Like right now, my last session we were talking about studying for the MCAT, and we were both agreeing that CARS is the most difficult thing for us because of the language barrier and understanding all the passages. And, so it was nice to have someone else to empathize with me in that because most people don't have that issue as much. (Y4, IG FG)*

> *I think the cultural aspect. So, having a similar cultural background is really helpful for me, because a lot of times I struggle with my family's cultural values and different scenarios of my personal life that I was at. And, just being able to talk with someone that understood how Hispanic families work and how Latinx cultural ideals sometimes can clash with your ideals. So, having someone that has gone through that was helpful for me. (Y4, IG FG)*

Mentoring for Hispanic, first-generation, undocumented and underrepresented students was highly valued. Both students and mentors explained the importance of mentoring within a cultural and systemic context. They noted that advancement in health and medical fields necessitated access to financial resources, professional guidance, and a complete prioritization of studies, that were inconsistent with the opportunities available to many Hispanic students and families. Recognizing this context, mentoring for this student group served to validate the students' lived experience and instilled a sense of confidence by having someone who looks like them, in a career they aspire to act as their cheerleader reminding them of their ability to achieve their goals.

> *I feel like our experiences tend to be quite different from the rest of our classmates, whether it's on how we tackled the finances, or the academics, or the balancing. Other cultures maybe don't have to feel that pull between family and your dreams and your goals or between, again, working to try and make some of this happen—where other people might have means, and they don't have to work. So, I think for mentees, it's very beneficial to actually have it coming from someone who already now is on the other end, but started very similar to them, and doesn't necessarily fit that cookie-cutter applicant*

profile. … Both of my mentees, at the beginning, were super appreciative because they're like, "You're like the first Latina dentist. The only people normally I can go to are my advisors at school, but they aren't – well, they're not dentists, and they're not Hispanic." So, I think that's something that changes drastically the way they see themselves, because they can kinda see themselves in you. And then throughout that journey, they get to stay motivated or inspired. Maybe during a certain period where they're starting doubt, you can talk to them and kind of – maybe you had that same experience, and then they're like, "Oh, wow. Okay, maybe I can still do this," and they continue on track. (Y4 Mentor FG)

Also, I know that through the NHMA, it's really nice to be able to look up to someone who has gone through similar experiences as yourself. So, for me, being the first one in my family to be interested in medicine and want to pursue it as a career, it's been very inspiring. It makes those wants, dreams that didn't seem possible at all, make them seem possible, make them seem like they're a reality that's in reach. So, that's been a great encouragement to me. (Y3, IG FG)

Overall, the CHSP validated students' desires to have a career in health or medicine, deepened their commitment, and increased their belief in their capacity to achieve their academic and professional goals. Mentoring appeared to be particularly impactful as students noted its effect on their academic success, personal and professional development, and finances. Mentors helped students edit application essays, improve their study skills, and manage heavy—and challenging—course loads. They also provided useful information on scholarships, resources, and conferences. One student learned about assistance with graduate school application fees, which allowed her to apply to a greater number of schools. Another student's mentor bought her first stethoscope and connected her to other programs within her area of interest; still another signed her mentee up to attend the Latino Medical Student Association's national conference. Students explained how valuable it is to have someone supporting them, who is interested in discussing what their goals are and how the choices they make (e.g., classes, internships) can help them build towards achieving those goals. This combination of emotional support and professional development made students feel less isolated. As one student put it, it is one of the "best things that's ever happened to me." (Y4 IG FG)

He bought me my first stethoscope. He's helped me with test prep for my NCLEX [National Council Licensure Examination] later on this year. He's helped me immensely with everything throughout nursing school, especially with any classes that I had struggled with. For example, pharmacology was a little tough and I remember specifically I had a whole mental breakdown one day, and I had called him over the phone. And, I was crying and then he was like, "Okay. Let's take a breather and let's just go step by step. What medications are you learning?" And, we just went for hours just learning about each medication, what was the side effects, dose, why does he use it in his practice because he is a nurse practitioner…He's also helped me with connecting with other programs. I'm a part of NAHN, so it's the National Association of Hispanic Nurses, and with them I feel very connected with them just because they're all nurses and we're all Hispanic. (Y4 IG FG)

But by providing a mentor – even my student a lot of times, she's like, "Oh, I don't know if I can handle these classes. I don't know if I'll get into this research program." If you don't apply, you're never gonna know, so you should just try, right. And I feel like a lot of time I'm just like a cheerleader just instilling in them that sense you can do it and just giving them the confidence and the tools to be successful in whatever they decide to become. (Y4 Mentor FG)

The CHSP makes a concerted effort to thoughtfully pair mentors and mentees based on specific characteristics including gender, age, health area of interest, region, and background. Over the years, NHMA has incorporated feedback from students to hone their pairing process. Across the years, students and mentors noted factors they felt were important to support and positive mentor-mentee connection. These factors include:

- Being close in age, as younger mentors were perceived to have greater awareness of available resources and current processes, having more recently been in the mentees situation;
- Having a similar background (e.g., being first-generation, first language is Spanish)

I can say that throughout my education, from elementary school up until now, I've never had the guidance [on] how to send proper emails, how to apply for scholarships, how to ask for help when you needed it, because when I would come home, and I would have problems in school, I would keep it inside of myself, because in my head I would think none of the problems I face are as great or as big as the problems my parents faced every day, from trying to pay the bills, trying to pay for food, stuff like that. So, I just kept it to myself, and I think through the mentoring, I've realized that asking for help is okay, and having problems is totally valid. (Y3 IG FG)

I think for me because I'm not on the same time zone, and I'm not the same cultural background – we are all Hispanic. We're Latina, but not the same type. But I think just what has helped us connect is we are all first-generation. And we didn't have someone who we knew growing up in that field. Our parents didn't have a higher education or even a high school education. So, I think we connect over that. (Y4 Mentor FG)

Factors that served as barriers to a strong mentor-mentee connection included lack of availability, not sharing a similar background or area of career interest or living in very different parts of the country. Mismatched expectations about the limits of what mentoring can do for a student (e.g., mentors cannot provide entry to medical school), and a lack of clear communication from mentee's made connecting challenging. Mentors recommended that NHMA reiterate what students can expect from their mentorship experience and communication guidelines to address these issues.

And the only thing that I'm wondering is kinda getting to the aspect of not answering calls or responding. I think sometimes professionalism has this thing that naturally disadvantages people who haven't been raised in a culture of things of how to do things. And a prompt that's maybe more reflective than, "Talk to your mentor about X," but being like, "Mentoring up and how to do that." Or…. "You may not realize, but this," and then it could be talked about with us. But maybe something that's a little bit more prescriptive

than open answered. Because I just feel like my student didn't realize that I'm really busy, too, in my role and that all of you guys are super busy, too. (Y4 Mentor FG)

I get that people have things going on. But I think even just the recognition that you've received the email and being like, "Hey, I'm in finals this week. I got your email. Maybe we can talk about it next week or whatever." Because I think it can – easily, three weeks, a month can go by, and you're like, "I don't know. I keep checking in about these prompts." I think that was the experience with the first mentee I had. Sometimes, she would answer. Sometimes, no. And then I don't know if it was that the prompt was not relevant or anything like that, but it kinda felt like, what is my role here if you won't even answer my email. (Y4 Mentor FG)

My experience, I can describe it very positive. I love the guy. Always available and very kind and very supportive; however, he's in Puerto Rico. So, I'm in the United States and I'm trying to go into an MD program here. So, he doesn't know what's happening in here. But it's to the point where I've had it for maybe a year and a half or so, I forgot how long I've been here, so I don't wanna get rematched because it's really cool and he's a friend at this stage. But at the same time initially, I wish it would've been somebody in the [continental] U.S. (Y4 IG FG)

When there were differences in career, location and background (e.g., finances), mentors requested access to relevant resources to address their mentee's questions and concerns. Mentors requested more resources on specific areas of finance to discuss with their mentee, particularly if they had little experience or understanding on the topic themselves; including how to budget while in college; the cost of applying to medical school; and approaches to paying for medical school, including loan repayment programs.

I feel like I am not very equipped to talk about the financial aspects of it. Being MD-PhD, I don't have to take loans for paying for medical school. And so, that's like a huge black hole in my – I have a huge gap in my knowledge. And so, even though I think the prompts are great and those things that the students should be thinking about, I, myself, am personally not equipped to – I'm not an expert in answering all of those questions. (Y4 Mentor FG)

RECOMMENDATIONS

Program recommendations aligned with feedback received in previous years and are noted below in bulleted form, by topic.

Onboarding: Process & Program Expectations

- Orient students and mentors to the program by:
    - Host an onboarding webinar for participants to: 1) see the various aspects of the program and how to access them and use them (e.g., what is MentorNet, how to use private online student group); 2) allow students to get to know others in the program and the NHMA program staff; and 3) clarify expectations around

respecting the time commitment from one another (e.g., keeping to scheduled appointments and communicating if plans change).

- Create a resource hub for mentors that includes:
    - An explicit statement of the program vision, goals, and the three main categories (professional/personal development, academics, finances) the program is intending to address.
    - A full list of all MentorNet prompts for mentors to understand the larger program vision.
    - A general list of milestones that students will need to achieve to matriculate into a health professional/graduate program that mentors should be aware of (e.g., pre-med courses, when to start preparing for standardized exams and working on graduate school applications)
    - Resources that mentors can share with their mentees, particularly related to finances.

Private Online Student Group

- Increase accessibility and ease of navigation.
- Create and distribute a video tutorial on how to use the site (e.g., how to access the site and navigate to the discussion boards)
- Regular reminders regarding the group, its purpose, and available resources

Mentor – Mentee Matching

- Pair students and mentors who share non-traditional educational paths[6] or specific challenges, like those experienced by undocumented students

NHMA Resources Webpage

- Build out the website, in general, and clarify which sections of the website are specifically for college students, similarly to how resources for current providers are identified.
- Develop a section on financial issues, including how to finance graduate school. This section should include information on scholarships and programs available to support students through graduate school, as well as information for undocumented students.
- Provide information on shadowing and scholarship opportunities that are updated at regular intervals so that students know when to check the website for new resources.
- Provide resources for DACA students.
- Create a MCAT prep question bank for student use.

Webinars

- **Format & Timing:**
    - Additional time for each speaker to present and for Q&A

[6] In this report, the term non-traditional student refers to any student who experienced a significant break or interruption in their studies, or who took classes part-time as they pursued their undergraduate and/or graduate degree.

    - Information presented without jargon and using accessible language
    - Opportunities for students to participate in breakout rooms after the webinar to network with each other, and with the presenters
- **Additional topics:**
    - Explicitly address the role of race, racism, and socioeconomic status on health
    - Specific details on financing education, including 1) accessing loans for graduate study, 2) loan payback, 3) loan forgiveness programs, 4) management and budgeting loan payments (e.g., how do you budget for your groceries, do you track your funds using excel?)
    - Gap years
    - Mentor panel providing exposure to additional mentor experiences outside of 1-1 mentorship
- **Additional presenters:**
    - Individuals whose work focuses on addressing health inequities explicitly, and the various approaches to supporting health outside of a clinical setting (e.g., health and the law, public health professionals, social workers)
    - Financial aid officers to present on what, concretely, students should understand about financial aid and how it works.
    - Admissions personnel to discuss application tips

Connection and engagement

    - Additional opportunity for peers with similar interests and backgrounds to connect virtually with one another (particularly for non-traditional students).
    - Regularly distribute monthly email/newsletter including a detailed schedule of all upcoming NHMA and CHSP events, activities, and timing for informational updates. Include the links to the tutorials on how to navigate the various program components.

DISCUSSION

The aim of this study was to evaluate the extent to which the CHSP facilitates an increase in the diversity of the health workforce by expanding the number of practicing Hispanic physicians, health professionals and scientists/researchers. While analysis of the quantitative data collected do not show statistically significant differences between the intervention and control groups with respect to number of science courses completed with a passing grade, overall GPA, or an intention to have a career in health or medicine, both quantitative and qualitative findings show substantial program value and impact.

Although participants had generally positive perceptions of all program components, the mentoring component was—not surprisingly—the most impactful. Findings show that having a CHSP mentor increased the confidence of IG students, as well as their belief in their ability to achieve their personal and professional goals, awareness of the resources needed to continue onto graduate school and how to access them, validation that they belong in the healthcare field, and strategies to address future obstacles. In interviews and focus groups, mentors and

mentees emphasized the personal and professional guidance provided through the mentorship relationship. Likely valuable for most college students, the support was particularly important for CHSP students, who may lack mentors in their career of interest they can identify with, academic guidance from their pre-existing networks, and challenges that are significantly greater (e.g., being undocumented) than their fellow students. These impacts, though more difficult to quantify and prove than GPA, were greatly appreciated by students and helped to maintain their commitment to health and medical careers.

Appendix 1. Power Analysis

Power Analysis

Power and sample size calculations are most frequently used in the planning stages of a study to provide an estimate for the number of individuals needed to detect a statistically significant difference in a selected outcome, between groups. For the CHSP, NYAM conducted a power analysis using two outcomes: GPA and matriculation rates based on estimated effect sizes from three studies examining the impact of supportive programming for student matriculation into STEM careers and medical schools [7][8][9].

The number of program participants the CHSP needs will change based on the type of outcome, statistical test being used, the difference the CHSP would expect to see, and the power level. The sample size required will decrease as you either decrease the power and/or increase the difference (or odds ratio) between groups. Since GPA is a continuous measure, an acceptable outcome is the mean; therefore, the mean difference between groups can be tested for statistical significance using a t-test. For example, if we wanted to see a mean difference of 0.4 GPA points and have the study powered at 90%, meaning you would see a statistically significant result 90% of the time, we would need approximately 30 students in each group. However, if CHSP wanted to be able to detect a mean difference of 0.2 GPA points with 90% power, 120 students are needed in each group. On the other hand, matriculation is a dichotomous measure; so, odds ratio helps to compare the odds of matriculating in the IG vs. CG. An OR=1 is interpreted as no difference between groups; while an OR>1 is interpreted as the intervention group having a higher probability of matriculating than the controls. For example, if CHSP expects that intervention students will have a 2.5 higher chance of matriculating (OR=2.5) than controls with 90% power, a sample size of approximately 130 is needed in each group.

Regardless of which outcome NHMA is interested in focusing on, as of year 4, the CHSP had over 400 student CHSP participants in each study arm, indicating that the study is sufficiently powered to detect a statistically significant difference between the IG and CG according to these two variables, if a significant difference exists.

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[7] *Campbell KM, Berne-Anderson T, Wang A, Dormeus G, Rodríguez JE. USSTRIDE program is associated with competitive Black and Latino student applicants to medical school. Medical Education Online. 2014;19(1):24200. doi:10.3402/meo.v19.24200*

[8] *D'Souza MJ, Shuman KE, Wentzien DE, Roeske KP. Working with the Wesley College Cannon Scholar Program: Improving Retention, Persistence, and Success. Journal of STEM Education: Innovations and Research. https://www.jstem.org/jstem/index.php/JSTEM/article/view/2239. Accessed September 19, 2019.*

[9] *Dupont WD, Plummer WD: "Power and Sample Size Calculations: A Review and Computer Program", Controlled Clinical Trials 1990; 11:116-28. http://biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize*