

Value of Near-Peer Mentorship from Protégé and Mentor Perspectives: A Strategy to Increase Physician Workforce Diversity

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Abstract: Purpose: Mentorship is a critical aspect of personal and professional development in academic medicine and helps to improve career satisfaction, productivity, and social networking. However, individuals from communities underrepresented in medicine (URiM) across the training continuum experience difficulty obtaining mentors, even prior to college. The value of near-peer mentorship is less well studied in medicine relative to other fields. The purpose of this mixed methods study is to explore the mentorship experiences of high school student protégés and their medical student mentors, as well as provide a description of the key features of the Doctors of Tomorrow (DOT) program.

Methods: From November 2014 to September 2015, the authors used focus groups and critical incident narratives with 9th grade high school students as well as focus groups and semi-structured interviews with medical students to examine mentor-protégé experiences in the Doctors of Tomorrow (DOT) program. In 2016, thirty-one medical student mentors were asked to complete an online survey about their mentor experiences. Focus group and interview data were audio-recorded and transcribed verbatim. All data were coded using thematic analysis and recurring codes were organized into categories, then compared, scrutinized and arranged into broader themes by all authors.

Results: The analysis of data from 70 medical students and 52 high school students revealed that mentors and protégés valued their mentor relationships based on regular in-person and electronic contact, shared common non-academic interests, and the anticipated prolonged nature of the relationship. Mentors also reported they initiated contact with their protégés every 2–3 weeks and monthly outside of program events, with email communication as the most common modality.

Conclusions: Near-peer relationships between high school and medical students may be an innovative strategy to promote health care careers, increase access to mentorship and develop meaningful mentorship relationships for URiM high school students.

Keywords: Underrepresented in medicine ■ Healthcare workforce diversity ■ Mentorship ■ Near-peer mentoring

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INTRODUCTION

Mentorship is a critical aspect of personal and professional development in academic medicine as these relationships have been shown to improve career satisfaction, productivity, and social networking.^{1–3} Successful mentor relationships engender a personal connection, foster trust, improve access to career opportunities, safeguard the protégé,^{4,5} from potential academic pitfalls, and generally develop based on personal and professional values.^{2,6} However, persons underrepresented in medicine (URiM)⁷ are more likely to experience challenges obtaining mentors,^{2,8,9} even prior to college. URiM high school students with interests in the health care field experience difficulty identifying mentors to nurture their interest.¹⁰ Additionally, the lack of mentorship is one of several factors that impede achieving a more diverse healthcare workforce.¹¹ Racial and ethnic minorities are projected to represent 50% of the U. S. population by 2050. However, as of 2015 African-Americans, Mexican-Americans, mainland Puerto Ricans, and American Indians continue to be underrepresented in medicine relative to their proportions in the US population.^{7,12} Therefore, it is essential to enhance strategies to connect URiM students to

a The terms protégé and mentee are often used interchangeably. Protégé connotes a relationship where the mentor serves as a non-judgmental advisor, but can also lead to sponsored opportunities, and is expected to evolve over a prolonged time period (i.e., years).

mentorship opportunities in order to diversify the health care workforce.

Near-peer mentorship is an innovative approach to increasing engagement of students from URiM backgrounds in health professional fields and addressing the lack of diversity in the health care workforce. This approach provides an opportunity to meet prospective role models, mentors, and improve access to enriching discussions and activities related to health care careers. Near-peer mentor relationships are a partnership between persons close in social, professional, or age levels.¹³ Near-peer mentoring programs have been incorporated in science, technology, engineering, and mathematics (STEM) fields,^{14,15} business,¹⁶ and undergraduate education,¹⁷ as a strategy to increase access to mentors and create pathways to achieve more inclusive and diverse student populations. These programs have the potential to increase students' interest in pursuing health care careers.^{18,19} However, the impact of such programs has not been well studied in medicine. Less formal interactions with junior mentors may be more relatable and accessible than those with more traditional senior mentors.²⁰ We explored medical student mentors' and high school student protégés' perspectives of their mentorship experiences in the Doctors of Tomorrow (DoT) program.

METHOD

Study population

A total of 80 first-year medical students at the University of Michigan's Medical School and 80 ninth-grade high

school students at Cass Technical High School (CTHS), a public college preparatory school in Detroit, Michigan were to be invited to participate in this study (Table 1). All DoT medical and high school students provided informed consent to participate in this study. The Institutional Review Board at the University of Michigan approved this study.

Program description

The Doctors of Tomorrow program pairs first-year medical students with freshman high school students interested in pursuing a health care career (previously described in greater detail).²¹ The mentorship pairs are arranged randomly, rather than based on gender or racial congruence. The program is longitudinal (minimum of one-year commitment) and includes mentorship, hands-on clinical experiences, academic preparation, and professional development.²² During the program, there are at least 7 mandatory in-person interactions between the mentor and protégé (lunch, meetings related to capstone project, panels, shadowing, etc.) at the University, and 2 visits to the high school (capstone planning, and final capstone presentation). Mentors sign a written contract agreeing to maintain contact with their protégés every 2 weeks for the duration of the program.

Medical students also participate in professional development activities focused on mentorship skills (instructional workshops, presentations, etc.) to enhance their ability to clarify individual expectations, uncover mutual interests, and promote conversations based on similarities in experiences during this educational adjustment period (i.e., first year of medical and high school). Other aspects of the professional development include sessions related to unconscious bias, coaching, and collaborating on a team.

Data collection and analysis

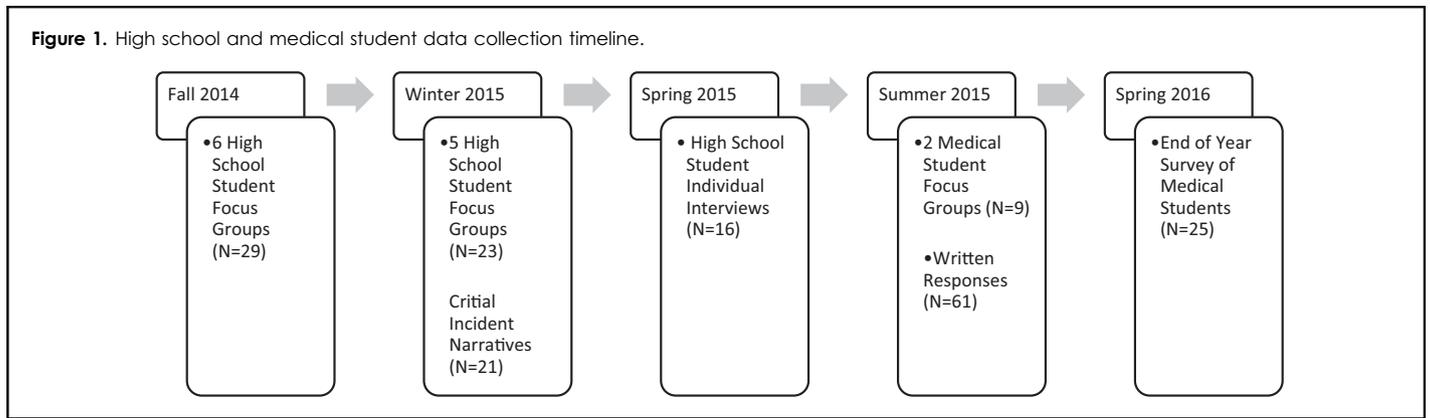
The data for this study included focus groups, individual interviews, and written responses in which we asked both medical students and their protégés to describe their mentorship experiences (Figure 1). We conducted two focus groups with medical students in August 2015 (N = 4) and September 2015 (N = 5). The duration of each focus group was approximately 40 min. An additional 61 medical students provided individual written responses in September 2015. A two-pronged approach was used for data collection for medical students due to low participation in the focus groups. With both the focus groups and the written responses, medical students were asked about their experiences with the peer mentoring program (i.e., experiences with high school student protégés, value of participating in the program, etc.).

Table 1. Mentor medical student and high school student protégé demographics.

Student Characteristics	Mentors N (%)	Protégés N (%)
Gender		
Male	34 (42.5%)	23 (29.0%)
Female	46 (57.5)	57 (71.%)
Race/ethnicity		
Asian	16 (20.0%)	14 (17%)
Caucasian	38 (47.5%)	
URiM ^a	19 (23.8%)	62 (78%)
Unknown ^b	7 (8.75%)	4 (5%)

^aIncludes all students who self-identified as African-American, Black, American Indian or Hispanic.

^bIncludes all students who self-identified as mixed race, or declined to respond given that there was no specific race or ethnicity provided.

Figure 1. High school and medical student data collection timeline.

High school student participants were asked to complete an incoming survey in 2014 ($n = 38$) and 2015 ($n = 35$). In this survey students provided data on their parents' educational attainment, household income, and educational experience of siblings (i.e., currently in or have attended college). Six focus groups were held with high school students in November 2014 ($n = 29$) and 5 focus groups in February 2015 ($n = 23$). Both focus groups lasted approximately 45 min. Twenty-one high school students submitted written critical incident narratives in February 2015. Critical incident reports were generally 1–2 pages in length and discussed their most memorable experience in the program to date. In March 2015, 16 of the high school students participated in individual follow-up interviews. Each interview lasted approximately 20 min. A semi-structured interview guide with open-ended questions was designed to explore the high school students' experiences with the DOT program (i.e., interactions with their mentors, reasons they were interested in a career in medicine, etc.).

All focus groups and interviews with medical students and protégés were audio recorded and anonymized. Responses were then transcribed verbatim and reviewed for accuracy. Initial thematic analysis was independently undertaken by one researcher (GS) reviewing and rereading transcripts, then coding using an iterative process. The codes were then compared and discussed among the authors (GS, PR) to ensure the trustworthiness of the analysis. Recurring codes were organized into categories of similar content. Categories were then further compared, scrutinized and organized into broader themes by all authors (AH, GS, PR). Data was managed using NVIVO[®] 10 (QSR International, Melbourne, Australia). As a new element in the program evaluation, 31 medical student mentors were asked to complete an online survey in 2016. The survey used Likert-style and open-ended questions to capture mentor experiences with the Doctors of Tomorrow program and interactions with their protégés (frequency of

contact, preferred manner of communication, topics of discussion, etc.). The survey was completed by 25 medical students (response rate = 81%). Descriptive statistics were performed to assess for trends in mentoring practices. We used triangulation, collecting data from multiple sources, and thick rich descriptions to enhance the credibility and trustworthiness of our data.

RESULTS

Of the 80 medical students and 80 high school students invited representing 80 near-peer mentor-protégé pairings, 70 medical students and 52 protégés voluntarily participated in this study. Identifiable characteristics of the mentor and protégé study participants are not included to maintain the anonymity of the data. High school students reported 19.2% ($N = 14$) of their mothers, and 11% ($N = 8$) of their fathers attained a 4-year degree (see Table 2.). The most common parental income among the high school students ranged from \$20,000 to \$34,999. In addition, 41.1% ($N = 30$) of the mentored students' siblings were reportedly in or have attended college.

Our analysis revealed three main themes (see Table 3.). High school student protégés and mentors valued their peer mentorship relationships based on (i) regular in-person and electronic contact, (ii) shared common interests, and (iii) the longitudinal nature of the experience.

Regular contact positively influenced their relationships

High school protégés and medical student mentors described how they formed a personal and professional connection. Many protégés recognized that their mentors were making a concerted effort to spend time with them. Protégés were aware of the challenges of their medical student mentors' arduous schedules. Therefore, high school students felt that their mentors genuinely cared for

Table 2. Cass tech high school protégé demographics.

N = 73 (%)	
Mother's Highest Level of Education	
Less than some high school	22 (30.1)
High school diploma or equivalent	5 (6.8)
Some college, but no degree	—
Associate's Degree	2 (2.7)
Four-year college graduate or beyond	14 (19.2)
Technical or Trade School	2 (2.7)
Unable to get this information	4 (5.5)
No Answer	24 (32.9)
Father's Highest Level of Education	
Less than some high school	8 (11.0)
High school diploma or equivalent	16 (21.9)
Some college, but no degree	8 (11.0)
Associate's Degree	4 (5.5)
Four-year college graduate or beyond	8 (11.0)
Technical or Trade School	1 (1.4)
Unable to get this information	4 (5.5)
No Answer	24 (32.9)
Household Income	
Less than \$20,000	7 (9.6)
\$20,000 to \$34,999	11 (15.1)
\$35,000 to \$49,999	1 (1.4)
\$50,000 to \$74,999	10 (13.7)
\$75,000 to \$99,999	2 (2.7)
Greater than \$100,000	3 (4.1)
Unable to get this information	10 (13.7)
No answer	29 (39.7)
Sibling Currently in, or Have Attended College	
No	18 (24.7)
Yes	30 (41.1)
NA	1 (1.4)
No answer	24 (32.9)

them by choosing to devote time to them. Other high school students remarked on how the relationship with their mentor matured through frequent contact. Students appreciated having opportunities to engage face-to-face with their mentor, but also valued when their mentor contacted them using electronic modalities (e.g., e-mail, text message). One student commented:

"... having lunch and talking with my mentor. This is important and memorable, because he was helping

and telling me about medical school. My mentor always sent me emails over the breaks to make sure that I was doing well, and to see how I was enjoying myself." -Protégé P1010

The consistent contact between the mentoring pairs enriched the mentors experience as well. One medical student stated that *"working with the students each month consistently re-energized me and reiterated why I chose to go into medicine in the first place."* All mentors (n = 25) responding to our survey reported they initiated contact with their protégés outside of scheduled program events. The majority of mentors (44%, n = 11) reported they initiated contact with their protégé every 2–3 weeks, 40% monthly (n = 10), and 16% weekly (n = 4). Most mentors (72%, n = 18) reported that their protégés responded "always or most of the time."

The protégés expressed a keen, yet implicit minimal threshold of interaction needed to foster the relationship with their mentor. Although a specific number of interactions was not required as part of program activities, several students described the variation of in-person and electronic exchanges with their mentor over time (i.e., lunch, emails, text messages, etc.) that enhanced the richness of their experience. Many mentors (95%, n = 20) reported using email, 10% text message (n = 2), and 5% (n = 1) other modalities to communicate with protégés outside of scheduled program events. Conversely, when protégés perceived that their mentors failed to achieve sufficient interactions with them this impaired their ability to connect with them. For example:

"... I feel like our mentors should've been there more often and I only have met my mentor once, how are our mentors supposed to mentor us if they are not there." -Protégé P1050.

Identifying personal commonalities and interests enhanced the relationships

Interactions between the mentors and protégés were shaped by the content of their conversations. Both groups expressed the importance of integrating opportunities to share personal interests as well as discussions about academic medicine. Medical students most commonly reported discussing topics (note, able to select all that apply) related to: interests/hobbies (95%, n = 20), high school education (90%, n = 19), undergraduate (71%, n = 15) and medical education (71%, n = 15). By sharing personal aspects, participants found common interests and were able to relate to one another. Discussion

Table 3. Themes and subthemes from the experiences of mentor and protégé and valuable aspects of their near-peer relationship.

Theme	Subthemes
Regular contact positively influenced their relationships	<ul style="list-style-type: none"> • Consistency of contact. • Varied modalities of engagement.
Identifying personal commonalities and interests enhanced the relationships	<ul style="list-style-type: none"> • Building connections based on academic and personal interests. • Personal connections broadened protégés' perspective on a career in medicine and being a medical student.
Anticipated value of longitudinal contact built deeper connections	<ul style="list-style-type: none"> • Long-term resource for protégé. • Ability for mentor to inspire and shape protégé's trajectory.

topics ranged from what type of doctor they wanted to be to less formal topics such as food, family, and video games. As familiarity between the high school and medical students improved, the more fondness and enjoyment they gained from their interactions. One mentor commented on the importance of getting to know protégés on a personal level:

"My mentee was pretty shy at the beginning, and so [I] was trying to find different approaches, trying to get to know her better, figure her out and see what kind of brought out her passion and what made her want to talk and—sort of thing. So [I used] different approaches, it's not ... just technical; it's forming relationships. I think that really was what I was working on with her."—Mentor M82615

Finding commonalities was an important foundational step for the participants to connect with one another. Creating personal connections sparked protégé's interest not only in their mentor, but also in the field of medicine. One protégé shared:

"[My mentor] shared stories about her family which is quite similar to mine. She talked about her experience in college and then she talked about medical school ... When the meeting came to a close I didn't want to go home. I wanted to stay planted in my

chair talking to her. That night I stayed up thinking about the medical field."—Protégé P2040

Building these personal connections also broadened protégés' perspective on the characteristics of medical students in general. These relationships provided protégés with greater insight into the person behind the medical student title and enhanced their ability to see themselves in those same shoes. One high school student described how their perception of medical students changed after getting to know their mentor:

"I thought that the mentors ... it's the stereotype of the medical students, they're all uptight and serious and everything's about business. [But] it's like she's like me. She's really just like me." Protégé P3010

Anticipated value of longitudinal contact built deeper connections

High school and medical student participants reflected on the importance of the longitudinal nature of the relationship. Protégés described how they envisioned that their mentor would be a life-long resource for emotional and academic support and guidance. Medical student mentors commented on how the longitudinal aspect of their relationship provided an opportunity to positively shape the trajectory of their protégés. One mentor shared:

"I love the idea of working with a specific student for a long period of time. I believe that providing mentorship to one individual throughout the year will make a great impact. Connecting with one student and making a difference in his/her life at an early age is very appealing to me."—Mentor M1003

Medical student mentors also anticipated that the continued involvement with their protégé would have a reciprocal effect on them. The mentors considered how remaining present in the high school students' life would provide their protégé with a source of inspiration, and the mentor an opportunity to develop a deeper connection over time.

"I also will learn so much myself as I form this longitudinal relationship with a student. I would love to really push myself to become a friend and someone to look up to for the student."—Mentor M1029

DISCUSSION

Our study provides insight into the mutually beneficial elements of near-peer mentor relationships in medicine. Both mentors and protégés' valued consistent contact, and

finding both academic and personal commonalities. Both groups also valued the long-term aspect of the relationship which facilitated their ability to develop authentic relationships and engage in meaningful experiences. Traditionally, pipeline programs are short-term educational strategies offered to college students.²³ The DoT program facilitated an opportunity to pair high school students with mentors and cultivate their interest in health professions earlier, and over a more longitudinal time course compared to conventional programs.

Regular contact (via email, texts, and in-person) was a valuable component to the mentor relationships in this study. Even with the demands of medical education (e.g., long study hours, class time and laboratory work), the pairs preserved their connections using a variety of communication techniques in between in-person meetings. This finding emphasizes that students continued to feel engaged with their mentor as long as contact was made, regardless of the methods. Protégés had an appreciation for the regular contact as it demonstrated how much the mentor valued the relationship. Our findings suggest that electronic modalities are an effective way to engage with the protégés and enhanced the quality of the mentor relationship. Email and text messages may also resonate as a preferred communication style for younger populations who tend to be more technologically savvy.

The near-peer pairs built strong connections by fostering individual interests. Finding commonalities in their personalities and interests was a catalyst for their conversations and enhanced their ability to relate to each other, which is an essential aspect to building any relationship. Protégés appreciated that their mentors demonstrated interest in them personally, and were excited to find common interests that they both shared, which is consistent with other work that highlighted the importance of developing a personal connection⁶ and chemistry.²⁴

This relationship also gave high school student protégés the opportunity to receive encouragement from people at a stage of their education that they hope to achieve. This relationship expanded protégés' visual and behavior perceptions about medical students to include students like themselves. Adolescence marks a critical time to gain exposure to new ideas and attitudes that shape development of professional identity, which has been found to greatly enhance feelings of belonging and solidarity produced through professional relationships.²⁵ Interestingly, the mentorship pairs were not racially or gender congruent, and concerns or issues related to differences in racial or gender did not emerge in the data. Students from URiM backgrounds may find it challenging to envision themselves as physicians due to barriers in accessing role models or mentors,²⁶ underestimation of URiM students'

potential to handle academic and financial demands of higher education,²⁷ and lack of racial/ethnic diversity in television and media portrayals of physicians. Cross-racial and cross-gender mentor-protégé relationships would certainly expand the pool of medical professionals available to support and validate their career ambitions. In the future, protégés may also be more open to establishing racially or gender discordant mentor relationships, which could expand the pool of available mentors. Developing meaningful mentor-protégé relationships could help improve diversity in the health care workforce.

Medical students also gained insight into the lives of their protégé. Other research has also shown that near-peer mentors develop a sense of empowerment and confidence from serving in a leadership role in a summer program with premedical high school students.¹⁹ Similarly, we found that the mentors felt more excited about mentorship and pursuing medicine after engaging with their protégés. Over the course of medical school, students' excitement for medicine and empathy can erode, and they become more cynical about their role in health care.^{28,29} Our study highlights how building meaningful connections with premedical students can help provide experiences that help to buffer the decline of these key altruistic attitudes and behaviors. Cross-cultural mentor relationships may also facilitate opportunities to dispel sociocultural biases, increase cultural awareness and consciousness, as well as reduce health disparities. While the high school student parents' education and household income levels starkly contrasted the national trend seen amongst the majority of medical students,^{30,31} both mentors and mentees formed solid relationships. This experience provided medical students insight into the talents of students from lower socioeconomic position and context into the ways it affects privileges afforded to some and barriers faced by others. Further, medical student mentors with this exposure may be more inclined to also enter mentor relationships that are discordant by race, gender, or other cultural identities. This exposure early in the medical student's training could also help them identify qualities that enhance the development of professional identity in others through role modeling, assisting with problem-solving, providing advice and being a source of encouragement.

Lastly, these results underscore the importance of gaining the perspective of both mentors and the protégés to enhance understanding of the impact of these mentor relationships on both parties. The high school protégés experience with the near-peer mentorship program increased interest, and excitement about pursuing a medical career. This indicates the value of the support and encouragement gained through the mentor relationship and how it helped to empower these high school

students to maintain their interest in pursuing a health care career.

LIMITATIONS

There were several limitations to our study. Our results from a single institution may not be generalizable to the attitudes of students from other high schools or medical schools. However, the medical and high school demographics are consistent with the majority of medical schools on predominantly white campuses and inner city high schools. Also, this study included a generous sample size, various modalities (i.e., written narratives, interviews, and focus groups) that provided rich data to learn from. Students' perspectives are subject to recall bias given the longitudinal nature of their experiences. Students may have also be affected by interviewer and social desirability bias given the inherent power differential in university-public school partnerships³² and the faculty-student interview dynamics, especially given the differences in age, race, and perceived status. This study focused on the value of mentor-protégé relationships, and does not explore the effect of other influential factors (e.g., social identity, family environmental, etc.) that may shape high school students career goal pursuits.

IMPLICATIONS

Our study provides novel insights into upstream strategies to enhance mentorship of pre-medical high school students. By elucidating high school students and medical student mentor perspectives, we further build on medical education literature on the value of mentoring which has predominantly focused on faculty, trainees, and medical students.³³ Near-peer mentorship relationships provided high school students from URiM backgrounds with an intimate view of the medical profession and insight into the life of a medical student. Our study also sheds light on students from URiM backgrounds voices to better understand what they want and value. Although the near-peer mentorship pairs were not racially congruent, protégés were able to recognize similarities in their own interests, and personal characteristics with that of their mentor. From the connection developed through the near-peer mentoring, both protégés and mentors felt empowered and more enthusiastic from these relationships and about pursuing a career in medicine. Near-peer relationships between high school and medical students may be an innovative strategy to promote health care careers, increase access to mentorship and develop meaningful mentorship relationships for URiM pre-college students.

ETHICAL APPROVAL

This study was approved by the University of Michigan Institutional Review Board.

DISCLAIMERS

None.

PREVIOUS PRESENTATIONS

The results of this study will be presented as an oral presentation at the Association of American Medical Colleges Annual meeting, Boston, MA on November 4, 2017, and has been presented as an oral presentation at the Central Group on Educational Affairs meeting, Chicago, Illinois, March 31, 2017, and as a poster presentation at the Health Professional Education conference, at the University of Michigan, Ann Arbor, Michigan, April 13, 2017.

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