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Exploring the Influence of an Interprofessional Student-Run Clinic on Matriculation to Health Professional School: A Retrospective Cross-Sectional Study

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Abstract

Background: Projected demographic trends in the United States suggest increasing racial and ethnic diversity. It is important that the healthcare workforce reflects these trends to reduce healthcare disparities among underserved populations. For example, concordant backgrounds between patients and providers improve communication and increase probability that patients seek and receive healthcare among marginalized populations. Building in curricular opportunities to connect with the underserved community is one way to recruit students from diverse backgrounds into this pipeline that will lead to a diverse workforce in healthcare. The objective of this study was to assess the influence of an interdisciplinary student-run clinic (SRC), which focuses on caring for underserved and vulnerable populations, on students' decisions to matriculate in four health professional programs (medical, occupational therapy, pharmacy, and physician assistant) at a single institution.
Methods: In this retrospective cross-sectional survey study, we examined factors influencing first-year students' decisions to attend a private university in a large metropolitan area. The primary outcome was students' self-reported ratings of the university's SRC as a factor in their matriculation decisions. Two-tailed Mann-Whitney-U tests was applied to compare the relative importance of SRC on matriculation. Free response data were evaluated by a qualitative content approach.
Results: A total of 419 students completed the survey (73% completion rate) across the 4 programs. We found that underrepresented minorities in medicine (URM) ($p < 0.05$) and first-generation ($p < 0.01$) students rated the importance of an SRC on their matriculation decision significantly higher than non-URM and non-first-generation students.
Conclusions: Our findings suggest that the presence of an SRC may positively impact matriculation decisions and diversification of the student body across certain health professional disciplines.

Introduction

The United States (U.S.) population continues to evolve rapidly towards a racially and ethnically pluralistic society. However, sweeping health disparities are persistent.[1-3] The ongoing coronavirus disease-2019 (COVID-19) pandemic further exacerbates these inequalities, as have past health crises.[4-5]

One strategy to ameliorate health disparities faced by racial and ethnic minorities is to reduce the discrepancy in representation between the U.S. population and its national healthcare workforce. Concordant backgrounds between patients and providers lead to improved communication and increased probability that patients seek and receive healthcare.[6-8] Increased concordance is also predicted to reduce mortality

and life expectancy gaps seen in underrepresented populations.[8] It is also well-documented that health professional students with underrepresented minorities (URM) and low-socioeconomic statuses are more likely to pursue a career caring for underserved populations.[9-10] However, URM representation within the growing healthcare workforce does not mirror the increasing diversification seen in the national population.[11] Therefore, diversification of future healthcare professionals and methods to achieve such diversity should be a priority for improving healthcare inequalities.[12-14]

Although the population of college-educated URM students is steadily growing in the U.S., recruitment of these students into healthcare programs remains inadequate.[15] Though efforts to increase the representation of URM health professionals through initiatives such as scholarships and pipeline programs exist,[16-19] we continue to fall short on matriculating student bodies that reflect the diverse patient population they will care for in the future.[15, 20-23] Further exploration of recruitment strategies for URM at the graduate institutional level is imperative.

In a 2012 study, Gu et al. found a significant connection between the presence of a student-run clinic (SRC) and attracting diverse applicants to health professional programs.[24] Three-quarters of medical schools in the U.S. operate SRCs, the majority of which provide care for underserved and vulnerable populations, with three-quarters of these involving an interprofessional team of caregivers.[25] While the benefits of SRCs with regard to student education and patient care have been well-documented,[26-28] their impact on student recruitment remains unclear. The educational opportunity to learn from and care for vulnerable patients, especially those from diverse racial and ethnic backgrounds, may influence the matriculation decision of students interested in working with these populations. The goal of the present study was to assess the influence of an interdisciplinary SRC on students' decisions to matriculate at associated pre-health programs (medicine, occupational therapy, pharmacy, and physician assistant).

Methods

SRC background

The University of Southern California (USC) SRC is situated in an urban setting in East Los Angeles, California. The clinic operates at three sites monthly to provide primary care services to underserved and uninsured patients. Participation in the program is voluntary. Students interested in the program submit an application, and the program leadership team randomly selects new members from a waitlist of volunteers. Each team consists of 6 students: one student coordinator, one preclinical student from each of the programs (medicine, occupational therapy, pharmacy, and physician assistant), and a clinical student from the medicine or physician assistant programs. Each team is precepted by faculty members from each of the respective programs. The interdisciplinary team cares for 1-4 patients during the half-day clinic period. Students either see the patient sequentially or simultaneously, then engage in a team huddle to share pertinent information in preparation for presentation to the preceptors. After case presentation, a care plan is developed through collaboration between disciplines. This clinic structure emphasizes shared decision-making among participants.

Study participants and Survey

In this retrospective cross-sectional survey study, all first-year students in each of the programs (medicine, occupational therapy, pharmacy, and physician assistant) were invited to complete a web-based survey on Qualtrics XM (Version 11.20, 2020, Qualtrics, Provo, UT) about factors that influenced their decision to matriculate at their respective programs. Participation in the anonymous study was voluntary, and their responses were recorded before students had the opportunity to participate in the SRC. Common elements of the survey for each program included age, race, ethnicity, gender, sexual orientation, disability status, and first-generation college student status, with an option to not disclose for each category. A five-point Likert scale ranging from "not at all important" to "extremely important" was used to assess the importance of various program-specific factors, including the SRC, in the respondent's decision to matriculate

to USC. Students were prompted by the question: "On a scale of 1-5, how important was each of these factors in your decision to attend (program)?" For respondents who ranked the SRC's importance as a 3 ("moderately important"), 4 ("very important"), or 5 ("extremely important"), an additional open-ended item was displayed, asking them to describe which aspects of the SRC influenced their decision to attend this institution. This option was included to evaluate in more depth why students ranked the SRC as important to their matriculation decision. These responses were evaluated by a summative content analysis as previously outlined by Hsieh and Shannon.[29] Briefly, three researchers independently coded the data, came to consensus on categories that represented the data through discussion, and then selected representative quotes for each category. The Institutional Review Board at the University of Southern California approved this study with an exempt status.

Statistical Analysis

Demographic data is reported by descriptive statistics. This study follows the Association of American Medical Colleges' definition of URM status as those racial and ethnic groups that are underrepresented in health care relative to their representation in the national population.[30] Individuals were categorized as URM if they identified as one of the following races: Black or African American, American Indian or Alaska Native, mixed race if one of the aforementioned races was included, and/or Hispanic.

Independent variables used to analyze mean SRC importance included gender; first generation status; URM status; identification as lesbian, gay, bisexual, transgender, queer, intersex, or asexual (LGBTQIA); and disability status. For each variable, participants from all four schools were classified into one of two aggregate categories: "female or male" for gender, or "yes or no" for every other variable. Individuals who selected "prefer not to answer" were omitted from the relevant analyses. Two-tailed Mann-Whitney-U tests ($\alpha = 0.05$) were then used to compare the relative importance of SRC on matriculation. Analysis of the relationship between age and mean SRC importance was performed by determining Spearman's rank correlation coefficient. All statistical analysis was completed using SPSS (Version 27, IBM Corp., Chicago, IL)

Results

The survey was distributed to 571 first year health professional students with 419 students completing the questionnaire, resulting in a 73% response rate (Table 1). Medical students comprised the largest proportion of respondents (34%), followed by pharmacy (30%), occupational therapy (25%), and physician assistant (11%) students. The majority of participants were female (69%), and the average age was 24.3 years. There were 146 respondents (35%) who identified as first-generation college students. There were 80 respondents (19%) who identified themselves as URM.

First-generation (mean = 3.43, standard deviation = 1.17) and URM (m = 3.44, sd = 1.19) students rated the importance of an SRC on their matriculation decision to be significantly higher than non-first generation (m = 2.98, sd = 1.21, $p < 0.01$) and non-URM (m = 3.07, sd = 1.19, $p < 0.05$) students (Figure 1), respectively. The differences between male and female, or based on LGBTQIA identification or disability status, did not reach statistical significance.

We explored the relationship between age and importance of the SRC on matriculation and found a weak but positive correlation ($\rho = 0.24$, $p < 0.01$).

For the open-ended item on the survey that was displayed only to students who ranked SRC as important, 212 free responses were analyzed by summative content analysis.[30] This qualitative exploration based on respondent's initial rating provided context to which they deemed SRC as an important factor in their decision to matriculate through the Keck School of Medicine. Four categories emerged from qualitative analysis of students' comments on which aspects of the SRC were influential in their decision to matriculate: 1) *clinical skills;* 2) *teamwork;* 3) *growth and leadership;* and 4) *serving the community*. Participants consistently identified the opportunity to practice *clinical skills* as an essential characteristic of SRC. Many participants described the importance of hands-on application of knowledge gained in the classroom, as noted in the

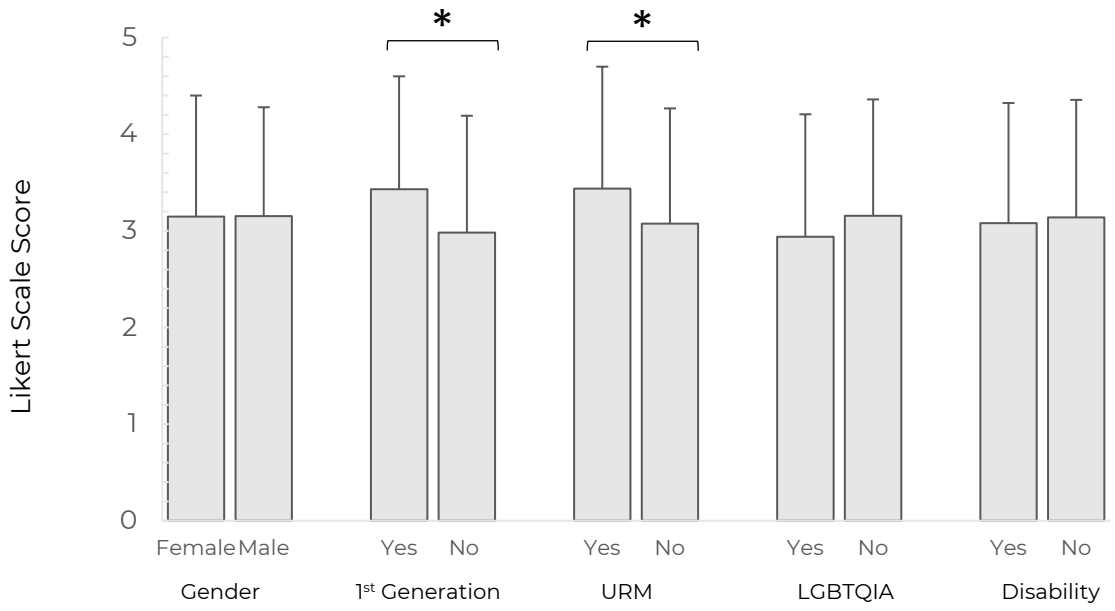
Table 1. Participant characteristics

Characteristic	Medicine, n (%)	OT, n (%)	Pharmacy, n (%)	PA, n (%)	Total, n (%)
Response	144 (76)	105 (77)	124 (65)	46 (78)	419 (73)
Mean Age (years)	24	24.2	23.6	27.7	24.3
Sex					
Female	82 (57)	93 (88)	77 (62)	36 (78)	288 (69)
Male	62 (43)	12 (12)	47 (38)	10 (22)	131 (31)
Race/Ethnicity					
American Indian or Alaska Native	0 (0)	0 (0)	0 (0)	1 (2)	1 (2)
Asian	59 (42)	34 (33)	75 (60)	16 (35)	184 (44)
Black or African American	5 (4)	2 (2)	4 (3)	1 (2)	12 (3)
Hispanic	18 (13)	24 (23)	10 (8)	14 (30)	66 (16)
Mixed Race	8 (6)	7 (7)	5 (4)	1 (2)	21 (5)
Non-Hispanic White	52 (37)	51 (49)	27 (22)	20 (43)	150 (36)
First-generation college student					
Yes	24 (17)	34 (32)	67 (54)	21 (46)	146 (35)
No	120 (83)	70 (67)	57 (46)	25 (54)	272 (65)
URM					
Yes	25 (17)	26 (25)	14 (11)	15 (33)	80 (19)
No	117 (81)	79 (75)	110 (89)	31 (67)	335 (81)
LGBTQIA					
Yes	21 (15)	7 (7)	8 (6)	2 (4)	38 (9)
No	120 (83)	97 (92)	115 (93)	44 (96)	376 (90)
Disability					
Yes	14 (10)	14 (13)	17 (14)	5 (11)	50 (12)
No	128 (89)	91 (87)	103 (83)	39 (85)	361 (86)

OT: occupational therapy; PA: physician assistant; URM: underrepresented in medicine; LGBTQIA: lesbian, gay, bisexual, transgender, queer, intersex, asexual

statement, "I like how [the SRC] gives us more opportunities to practice and perfect the skills that we learn in school and apply them in real life." Others emphasized their interest in gaining clinical experience early on in their training before beginning clinical rotations. Participants also found the *interdisciplinary, team-based nature* of the SRC to be a compelling factor. One participant commented that "working with and developing relationships with other healthcare professionals to benefit the holistic health of the patient" was especially important. Others were interested in collaborating with peers outside of the classroom and pursuing the "opportunity to work towards the same goals with other like-minded individuals." Some participants expressed interest in SRC because it "enables *growth, development and leadership opportunities*." Participants associated a sense of autonomy and empowerment with the student-led component of SRC. While some participants discussed their interest in "giving back to" or

Figure 1. Importance of SRC on matriculation report by Likert scale ratings



*Significant relationships are denoted by the * (P < 0.05)*
SRC: student-run clinic; URM: underrepresented in medicine; LGBTQIA: lesbian, gay, bisexual, transgender, queer, intersex, asexual

"making a difference" in the community more broadly, many others specified their interest in working with "underserved," "underprivileged," "disadvantaged," "homeless," "low-income," and/or "minority" populations. One student commented that the most influential aspect of the SRC was "the opportunity to work with individuals in the underprivileged community and understand their care and their needs." Some participants specifically mentioned the unique Los Angeles communities surrounding the university.

Discussion

Recruiting students from underrepresented groups to health professional programs is an important step in addressing the health disparities faced by structurally marginalized communities. Our interdisciplinary SRC provides students with opportunities to support and learn from patients who are under-resourced, low-income, and primarily people of color. Our study shows that its presence is an influential factor in applicants' decisions to matriculate to this institution across four health disciplines. This influence is significantly stronger among applicants who identify as URM and first-generation college students.

URM students may place greater importance on being able to work with, learn from, and provide care for underserved populations typically served by SRCs. These results support previous study by Gu et al., who explored the role of the University of Missouri School of Medicine SRC on medical students' decisions to apply to and attend the school.[24] They found that 71% of non-white medical students reported the SRC as an important factor in their choice to attend, compared to 48% of white students, although this difference was not statistically significant.

When given the opportunity to describe features of the SRC that attracted them to the program, students across disciplines frequently identified the opportunity to practice clinical skills, especially early on in their coursework, as a factor that influenced their decision to matriculate. The SRC model provides a unique extracurricular outlet where students are meaningfully exposed to the clinical setting even during their didactic curricula, creating important opportunities for early emotional and professional development and improved integration of basic science and clinical knowledge.[31-33] Students also highlighted the opportunities to work within a collaborative interdisciplinary environment and to

develop leadership skills. Interprofessional exercises allow for students to develop effective communication skills and to conceptualize their professional roles.[31] However, there are limited opportunities for students to interact and learn alongside students from different disciplines.[32] Our results reveal that students value these opportunities provided by SRCs when considering where to matriculate for their health professional training.

Respondents also elaborated on the importance of serving their community, specifically describing characteristics of the SRC's patient population that influenced their matriculation to USC. The consistent use of "underserved," "underprivileged," "disadvantaged," "homeless," "low-income," and "minority" underscored the value that students place on the opportunity to care for marginalized patients. Though the qualitative analysis of the comments was not robust enough to establish a solid causal effect, it did seem to trend toward our postulation that URM and first-generation students, who were more likely to rate the SRC as important, may be drawn to matriculate at institutions that provide them with robust opportunities to work with underserved populations. The SRC model fills a need to translate didactic learning about underserved populations into meaningful experiences with real patients.

Limitations and Future Directions

This was a single-institution survey, and our results may not be generalizable considering the diverse characteristics of SRCs across the nation. The importance of SRCs was on assessed via a single item. Further expansion of the multi-dimensionality of "importance" would increase the validity of the measure. The qualitative portion of our study only evaluated free responses from those who ranked the SRC as important to their matriculation decisions, limiting the interpretation of these results and excluding the possibility of comparison to those to those who did not rank the SRC as highly. Additionally, we did not make comparisons between programs at this institution as that would have required controlling for variables difficult to measure, such as the differential impact of program-specific SRC marketing to potential matriculants. More granular analyses would be important to highlight the goal of recruitment and establishment of an interprofessional team. Finally, the ideal timing of survey administration would have been immediately after the matriculation decision was made, as opposed to after students' arrival on campus. We used careful word choice in our survey design to minimize this limitation.

Implications for future studies include examining how SRCs are publicized across institutions and programs. This may involve interviewing students to assess how they gain information about SRCs and in what context, coordinating with admissions administrators to learn if programs intentionally provide information about SRCs, and exploring whether increased marketing of SRCs results in a great number or proportion of diverse applicants and matriculants.

Another aspect of the study worth exploring is to understand why students from diverse backgrounds rate SRC as important in informing their matriculation decision. Given that we did not specifically analyze URM or first-generation students' free responses independently given the limited number of responses, the qualitative component of this relationship could be further explored by thematic analysis of semi-structured interviews. Lastly, it is important to explore whether student involvement with SRCs is associated with serving vulnerable populations in the long-term and how initial interest in SRC involvement translates to later timepoints within a trainee's education.

Conclusions

Increasing diversity in the healthcare workforce should be a priority in order to begin addressing healthcare inequity in the U.S. This study demonstrates that SRCs may positively influence matriculation to health professional school, and particularly among students from URM and first-generation backgrounds. Qualitative analysis of a limited sample of free response data supports the notion that these students may be drawn to matriculate at institutions that provide them with robust opportunities to work with underserved populations. These findings may support the installment of SRCs for institutions struggling to diversify their health professions trainees.

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Disclosures

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