Mentorship of Underrepresented Physicians and Trainees in Academic Medicine: a Systematic Review

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BACKGROUND: Though the USA is becoming increasingly diverse, the physician workforce contains a disproportionately low number of physicians from racial and ethnic groups that are described as underrepresented in medicine (URiM). Mentorship has been proposed as one way to improve the retention and experiences of URiM physicians and trainees. The objective of this systematic review was to identify and describe mentoring programs for URiM physicians in academic medicine and to describe important themes from existing literature that can aid in the development of URiM mentorship programs.

METHODS: The authors searched PubMed, PsycINFO, ERIC, and Cochrane databases, and included original publications that described a US mentorship program involving academic medical doctors at the faculty or trainee level and were created for physicians who are URiM or provided results stratified by race/ethnicity.

RESULTS: Our search yielded 4,548 unique citations and 31 publications met our inclusion criteria. Frequently cited objectives of these programs were to improve research skills, to diversify representation in specific fields, and to recruit and retain URiM participants. Subjective outcomes were primarily participant satisfaction with the program and/or work climate. The dyad model of mentoring was the most common, though several novel models were also described. Program evaluations were primarily subjective and reported high satisfaction, although some reported objective outcomes including publications, retention, and promotion. All showed satisfactory outcomes for the mentorship programs.

DISCUSSION: This review describes a range of successful mentoring programs for URiM physicians. Our recommendations based on our review include the importance of institutional support for diversity, tailoring programs to local needs and resources, training mentors, and utilizing URiM and non-URiM mentors.

KEY WORDS: mentorship; underrepresented in medicine.

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BACKGROUND

The USA is becoming increasingly diverse with Black and Hispanic Americans accounting for 12.6% and 16.3% of the population, respectively.[1] Although there have been numerous national efforts to increase diversity in the physician workforce, numbers of medical school graduates from these ethnic and racial groups remain disproportionately low at 6.2% and 5.3%, respectively.[2] While the numbers of medical students from groups that are traditionally underrepresented in medicine (URiM) are increasing, this has not occurred for all ethnic and racial groups equally, as Black male applicants and matriculants to medical school have declined since 1978.[3]

Many studies have underscored the vital importance of diversity in the medical workforce. Having physicians from URiM backgrounds, which increases patient-physician concordance, has been associated with benefits for patient care, including increased satisfaction,[4] perceived quality of care,[5] and adherence to medication regimens.[6] Additionally, URiM physicians are more likely to practice in medically underserved and low-income communities.[7] In research, papers that are coauthored by ethnically diverse contributors have greater impact on the scientific community as measured by publication in higher impact factor journals and number of citations[8]; moreover, diversity in research team members can yield greater improvements in problem-solving.[9]

Despite the benefits associated with diversity in the medical workforce, significant disparities exist. Physicians from URiM backgrounds remain underrepresented at all levels of academic medicine.[10] URiM academic faculty are promoted at lower rates,[11] and both faculty and trainees report feelings of isolation and lower career satisfaction.[12] Disparities also exist in scientific research with one study demonstrating that Black scientists were 13% less likely to receive NIH funding when compared to white scientists.[13]

Mentorship is one proposed mechanism to address disparities for URiM physicians and trainees and has been associated with increased career satisfaction,[14] research productivity, and preparedness for junior faculty.[15] Unfortunately, URiM physicians are less likely to have mentors both as trainees[16] and as faculty.[17] Two prior reviews in 2013 and 2014 aimed to identify programs created to address the importance of

mentorship and faculty development for URiM academic faculty, but did not include trainees.[18, 19] We aimed to conduct a systematic review that identified and described existing mentoring programs for URiM physicians, inclusive of trainees, to identify barriers and facilitators to the success of such programs, and to assess for themes in mentorship programs for URiM physicians across the continuum of training.

METHODS

Search Strategy and Study Selection

This study was performed as part of a larger systematic review that was reported upon in two prior publications.[20, 21] We searched PubMed (1946–present), PsycINFO (1957–present), the Education Resources Information Center (ERIC) (1966–present), and the Cochrane Database of Systematic Reviews (1992–present), following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Our search strategy was developed in collaboration with a health sciences librarian (RT). The search strategy was developed using a combination of database-specific subject headings and keywords for the concepts of mentorship and academic medicine. Only those subspecialty terms that added unique references were included in the final search (Appendix). We also examined previously published systematic reviews to assure completeness of our search. We finalized our search on September 11, 2019. Two authors (EB and EU) independently evaluated all records for eligibility using DistillerSR (Evidence Partners, Ottawa, Canada), a web-based systematic review data management system. We resolved discrepancies by group discussion including the senior author (JC).

Study Eligibility Criteria

We included original publications that (1) described a mentorship program as defined below; (2) involved (though not necessarily exclusively) academic physicians or trainees (medical students, residents, fellows); (3) described a program designed for persons who are from URiM backgrounds, or provided results stratified by race/ethnicity; (4) described a US program; and (5) were published in English. We registered our detailed protocol on PROSPERO (University of York, York, UK), which can be accessed at: http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018067598.

We accepted the definition of mentorship as proposed by Beech et al.: "a developmental partnership in which knowledge, experience, skills and information are shared […] to foster the mentee's professional development and […] also to enhance the mentor's perspectives and knowledge."[18] We did not consider technique- or skill-teaching programs as mentorship programs. We utilized the Association of American Medical Colleges' definition of the concept "underrepresented in medicine": "those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population."[22] We limited our search to the USA in order to maximize generalizability for US programs, as racial/ethnic demographics, and therefore which groups are considered underrepresented, are society-specific.

Data Abstraction

Two study authors (EB and EU) independently abstracted the data, which included author and year published, number of mentors and mentees, model of the mentorship program (e.g., dyadic, peer mentoring), educational training level, racial/ethnic demographics, program objectives and components, method of evaluation and results, and barriers and facilitators of mentorship programs.

Study Quality

We were unable to perform a quality or bias assessment on 24 of the 31 included publications that presented descriptive data only, as no validated measures exist to assess quality of bias, and due to the heterogeneity of study design, outcome and assessment methods. One study[23] was a randomized controlled trial (RCT) and five presented data at two or more time points.[24–28] For these, we applied the National Heart, Lung and Blood Institute (NHLBI) Quality Assessment Tools for Controlled Intervention Studies and for Before-After Studies with No Control Group, respectively.[29] One study was qualitative,[30] and we applied the Critical Appraisal Skills Program (CASP) Checklist for Qualitative Studies.[31] Two authors (EB and JC) independently applied quality assessment tools to each study. Overall quality ratings based on the scale were assessed, and discrepancies were resolved through group discussion to reach consensus.

Development of Key Themes

Key themes were developed through an iterative process. Two authors (EB and EU) independently generated a list of key themes synthesized from careful review of all included papers. Criteria used were that themes should be both actionable and generalizable, and directly driven by results of included studies. Themes were discussed and refined, and where discrepancies existed, consensus was reached through deliberation and agreement with all study authors who were blinded to whether each theme was on one of both initial lists.

RESULTS

Publication Selection

We retrieved a total of 4,548 citations. After screening for duplicate records, 4,207 remained. A total of 3,476 records were excluded based on title and abstract screening, and 731 underwent full text review. In total, 31 publications[23–28, 30, 32–55] met all of our criteria and were included in the data analysis.

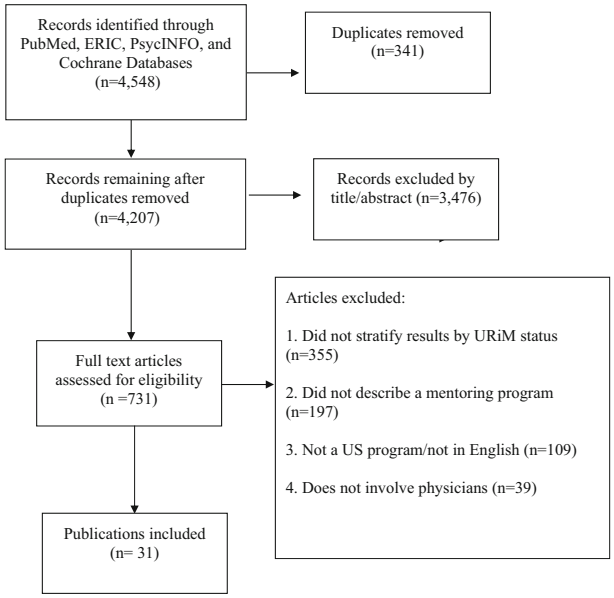

Figure 1 PRISMA flow diagram of publications identified in systematic review. ERIC, Education Resources Information Center; URiM, underrepresented in medicine; US, United States; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Reasons for exclusion of the remaining articles are enumerated in Fig. 1. The 31 publications described 28 mentorship programs.

Quality

Applying NHLBI Study Quality Assessment Tools, four studies[24, 26–28] were deemed to be of fair quality, and two studies[23, 25] deemed to be of good quality. The CASP Checklist is not designed to have a scoring system. Checklist results indicate that results of the qualitative study included[30] are valid and can be applied to local populations.

Program Participants

The majority of programs were targeted at specific academic levels, with seven programs targeted specifically to medical students,[26, 28, 32, 34, 38, 52, 53, 55] two programs specifically for residents,[37, 48] 10 programs specifically created for junior faculty,[24, 25, 30, 40–46, 51, 56] two programs addressed MD/DO trainees in post-doctoral programs,[43, 44, 47] and one addressed all faculty members.[33] Seven programs included more than one academic or training level,[23, 35, 36, 39, 49, 50, 54] ranging from high school students to faculty members. The number of mentees in each program ranged from seven[46] to more than 200.[23, 27, 32, 36, 51]

Half of the 28 programs were specifically created for URiM physicians and trainees, [26–28, 30, 33, 34, 37, 38, 40, 41, 43, 44, 48, 52, 54, 55]whereas the remaining 14, though not specifically created for URiM mentees, provided results stratified by race/ethnicity. Of those that included specific racial and ethnic demographic information, 14 included Black mentees,[24, 27, 28, 30, 32, 35, 37, 39, 47, 50–54] 12 included Hispanic or Latinx mentees,[24, 27, 28, 30, 32, 37, 39, 44, 47, 50, 51, 54] and five included American Indian/Alaska Native mentees.[27, 37, 39, 43, 44, 50] Eighteen programs did not specify the racial or ethnic demographics of the mentors in their program.[23–28, 30, 32, 33, 36, 38, 41–45, 47, 49–51, 54] Three programs were led by URiM mentors only,[34, 52, 53] while the rest included mentors from both URiM and non-URiM demographics in varying proportions (Table 1).

Mentorship Model

Sixteen[24-28,32,33,35,38,41-45,49,50,52,53,55,56] of the 28 programs exclusively used a traditional dyadic mentorship model, which includes a pair of a more experienced mentor and a junior mentee. The dyadic model of mentorship was used almost exclusively by those programs published prior to 2000,[52, 53, 55] whereas more varied models of mentorship emerged since then.

Two programs[33, 46] utilized a peer or horizontal mentorship model, in which individuals of the same rank or experience mentor each other.[46, 57] A group model of mentorship, which includes groups of multiple senior mentors and multiple junior mentees,[58] was utilized in two programs.[34, 39] Two programs instituted a dyadic model in combination with a peer model of mentorship.[23, 51] One of these programs was a RCT of mentorship interventions in URiM graduate students, fellows and junior faculty in health sciences that compared peer mentoring, a dyadic model where mentors received specific training, the combination of the two, and usual practice.[23] In three of the papers included in this review, the model of mentorship was unspecified.[30, 48, 54]

Table 1 Description, Objectives, and Evaluation of Mentorship Programs for URiM Physicians and Trainees

Study (year)	Study design	Program participants	Participant demographics	Mentorship model	Program evaluation	Evaluation results	Average study quality score[a,b]
Freel[51] (2017)	Post survey	Mentees: 197 junior faculty Mentors: Senior faculty	Mentees: 6.7% Black 3.0% Latino Mentors: Unspecified	Peer mentoring and dyad	Survey, academic productivity	Increase in skills for success for grants High satisfaction scores 100% of URiM grant applicants received grants	N/A
Rice[27] (2017)	Pre/post survey	Mentees: 204 junior faculty Mentors: Unspecified	Mentees: 67% Black, 27% Latino, 4% American Indian or Alaska Native Mentors: Unspecified	Dyad	Academic productivity, promotion, retention, awards. Survey, Clinical Research Appraisal Inventory, Ragins and MacFarlin Mentor Role Instrument	Greater number of independent-investigator awards received after training compared to mentored-research awards Mentorship important in developing research proposals and career advancement	Fair
Nellis[26] (2016)	Pre/post survey	Mentees: 15 medical students Mentors: Unspecified	Mentees: URiM Mentors: Unspecified	Dyad	Survey, publication, and recruitment	High student satisfaction with mentorship and rotation Average of 1.7 publications, six resulting from direct mentorship Seven students applied to ENT residency, and increased number of URiM ENT residents at home institution	Fair
Lewis[23] (2016)	RCT	Mentees: 150 graduate students, fellows, or junior faculty Mentors: 150 faculty	Mentees: 47% URiM Mentors: Unspecified	Dyad and peer	Pre-post Need Satisfaction Scale and Work Climate Questionnaire	Greater satisfaction of needs with mentor at 2 months in mentor training group No difference at 12 months in satisfaction among groups No difference at any time point in satisfaction at work	Good
Jean-Louis[30] (2016)	Mixed methods (survey, interviews, and focus groups)	Mentees: 29 junior faculty Mentors: Unspecified	Mentees: 79% Black 17% Hispanic Mentors: Unspecified	Unspecified	Academic productivity, survey	Number of publications rose in training period 5 mentees promoted Greater success with NIH grants than contemporaneous applicants (33% vs. 17.4%) High ratings in perception of mentor-mentee relationship	CASP Checklist performed[c]
Sopher[28] (2015) Fernandez[38] (2016)	Mixed methods (survey and interviews) Descriptive	Mentees: 13 medical students Mentors: 16 mentors in laboratory science, clinical research, clinical practice	Mentees: 54% Black, 46% Latino Mentors: Unspecified	Functional dyad	Survey and qualitative data	All students were very satisfied (92%) or satisfied (8%) with program All mentors enjoyed their experience, and expected to maintain	Fair N/A

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Table 1. (continued)

Study (year)	Study design	Program participants	Participant demographics	Mentorship model	Program evaluation	Evaluation results	Average study quality score[a,b]
						relationship with scholar Increase in all knowledge domains, and many skill-related domains	
Barron[32] (2015)	Post survey	Mentees: 191 medical students Mentors: Unspecified	Mentees: 17.3% Black; 9.9% Hispanic Mentors: Unspecified	Dyad	Survey and publication	50% of URiM participants pursued academic positions Increased interest in geriatrics Participants coauthored 582 manuscripts, 11 NIH grants, 3 K awards, 4 RO1s	N/A
Lin[33] (2016)	Descriptive	Mentees: Unspecified number of faculty Mentors: Unspecified number of faculty	Mentees: URiM Mentors: Unspecified	Peer	Number of URiM faculty, academic rank, and salary	Increased URiM faculty from 2 to 4 Increased URiM full professors from 0 to 1 Salary equal by rank and subspecialty training	N/A
Pachter[37] (2015)	Descriptive	Mentees: 65 residents Mentors: 47 fellows, 38 senior mentors	Mentees: 75% Black 15% Latino 2% Native American/Alaskan Mentors: 66% of fellows URiM, 50% of senior mentors URiM	Dyadic (each participant has one junior mentor and one senior mentor)	% of participants in academic careers and qualitative feedback	63% of participants are in academic careers Participants report positive comments about networking and friendship, exposure to research, and career direction	N/A
Crockett[50] (2014)	Descriptive	Mentees: 7 health professional students, 44 undergraduate students Mentors: Research scientists	Mentees: 37% Black, 30% Latino, 2% Native American Mentors: Unspecified	Dyad	Post-program training outcomes	Of 36 participants, 28 have jobs in health-related fields, or have been accepted to graduate/medical schools	N/A
de Dios[35] (2013)	Post survey	Mentees: 2 interns, 7 post-doctoral fellows, 5 junior faculty Mentors: 29 faculty	Mentees: 21% Black, 7% biracial, 14% Asian Mentors: 7% biracial 3% Latino 10% Asian 17% unknown 62% Caucasian	Dyad	Survey	All mentees reported being very satisfied (54.5%) or satisfied (45.5%) with their experience Majority (90.9%) planned to continue relationship with mentor	N/A
Afghani[36] (2013)	Post survey	Mentees: 253 high school students, 36 undergraduate students, 12 medical students Mentors: 8–9 faculty	Mentees: 22% of high school students URiM 67% undergraduate students URiM, 92% medical students URiM Mentors: Unspecified	"Cascading," (5 high school students matched with one undergraduate student, 2-3 undergraduate students matched with 1 medical student)	Survey	Medical students reported improvement in self-confidence, motivation for career in academic medicine, leadership abilities, teaching skills and care for underserved populations	N/A
Harris[39] (2012)	Post survey	13 medical students, 28 residents, 12 junior faculty, 6 community	41% Black, 32% Asian, 11% Latino 1% Native American, 15% Caucasian, 1%	Group	Academic productivity	Medical students, residents, and junior faculty have all reported publications, grants,	N/A

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Table 1. (continued)

Study (year)	Study design	Program participants	Participant demographics	Mentorship model	Program evaluation	Evaluation results	Average study quality score[a,b]
		members, 16 senior faculty, 6 national mentors	Egyptian American			presentation, and national and local awards directly as a result of this program	
Brown[49] (2011)	Descriptive	Mentees: 88 mentees including 40 MD/PhD candidates and 26 junior faculty Mentors: Faculty	Mentees: Most from "minority backgrounds" Mentors: Unspecified	Dyad	Academic productivity, recruitment	100% completed program Program yielded 42 peer-reviewed manuscripts and 16 funded grants 81% of participants pursuing career in NeuroAIDS research	N/A
Butler[48] (2010)	Post survey	Mentees: 76 general surgery residents Mentors: Faculty	Mentees: URiM Mentors: URiM and non-URiM	Unspecified	Number of graduates in academic careers	Of participants now in practice, 57% hold positions as full-time faculty members	N/A
Emans[42] (2008)	Post survey with follow-up	Mentees: Junior faculty Mentors: Unspecified	Mentees: Unspecified demographics Mentors: Unspecified	Dyad-mentorship teams	Survey, promotion, academic productivity	4 mentorship pairs were successful 60% increase in promotion for URiM faculty, though no change in percent of URIM faculty at any rank 5 URIM faculty/fellows awarded fellowships	N/A
Thomas-Squance[34] (2008)	Post survey	Mentees 34 medical students Mentors: 17 faculty	Mentees: URiM Mentors: URiM	Group	Survey	89% of respondents rated program as valuable Respondents valued meeting other students (43%) and mentors (54%) Respondents rated program as relevant to professional (84%) and personal (88%) development	N/A
Yager[44] (2007) Waitzkin[43] (2006)	Descriptive Descriptive	Mentees: 19 PhD, MD, and Masters students Mentors: Faculty	Mentees: Hispanic and American Indian Mentors: Unspecified	Dyad	Grants, promotions	24/31 funded grant proposals within 2 years 4/11 promoted to associate professor	N/A N/A
Lewellen-Williams[40] (2006)	Descriptive	Mentees: 22 junior faculty Mentors: 9 peers (junior faculty), 10 onsite faculty, unspecified distance (private practice, government figures)	Mentees: URiM Mentors: Unspecified for peer, distance. Onsite faculty URiM	POD (Peer-Onsite-Distance) which includes Dyad (including distance), and Peer	None	None	N/A
Kosoko-Lasaki[41] (2006)	Descriptive	Mentees: Junior faculty Mentors: Senior faculty	Mentees: URiM Mentors: Unspecified	Dyad	Retention, and promotion	Increased 5-year retention rate (58%) compared to before program (20%) Increase in number of URIM faculty (7.5%) compared to before program (6.9%) Proportion of tenure track increased	N/A

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Table 1. (continued)

Study (year)	Study design	Program participants	Participant demographics	Mentorship model	Program evaluation	Evaluation results	Average study quality score[a,b]
						(44%) compared to before program (25%)	
Wingard[25] (2004)	Pre-post survey	Mentees: 67 junior faculty Mentors: 59 senior faculty	Mentees: 9% URiM Mentors: Unspecified	Dyad	Survey, retention	Participants were more confident in academic roles, skills in research, education, and administrative responsibilities	Good
Daley[45] (2006)	Mixed methods (surveys, informal interviews, cross-sectional comparison)	Mentees:114 junior faculty Mentors: Senior faculty	Mentees: 13.4% URiM Mentors: Unspecified		Retention	5/6 URiM faculty stayed at institution, 6/6 stayed in academic medicine Four-year retention rate of URiM junior faculty at institution increased from 58 to 80% Increase in retention rates in academic medicine from 75 to 90%	N/A
Bussey-Jones[46] (2006)	Descriptive	Mentees: 7 junior faculty	Mentees: Diverse cultural backgrounds	Peer mentoring	None	None	N/A
Carnes[47] (2006)	Descriptive	Mentees: 15 medical doctorates or PhDs Mentors: Senior faculty	Mentees: 20% Black, 13% Latino, 7% Asian Mentors: Unspecified	Mosaic: research mentor, program director, advisory committee	Retention	5/9 graduated participants are in research-based academic careers 2 MDs left academia due to unsupportive climate for women and low salary	N/A
Benson[24] (2002)	Mixed methods (pre-post survey, structured interviews, focus groups)	Mentees: Preceptorship: 20 junior faculty Mentorship: 9 junior faculty Mentors: 29 senior faculty	Mentees: Preceptorship: 15% Asian, 9% Black, 3% Latino Mentorship: 22% Asian, 6% Black, 6% Latino Mentors: Unspecified	Dyad	Survey, retention	Higher participation from Asian, Black, and Latino faculty Psychosocial functions (e.g., counseling, friendship, role modeling) rated higher than career functions Preceptorship valued highly by mentors (89%) and mentees (83%). Mentorship valued by mentees (60%) and mentors (75%) Minority faculty retained at 100% in precepting program, while 33% in faculty without preceptors	Fair
Abernethy[55] (1999)	Post survey	Mentees: 30 medical students Mentors: 15 Faculty	Mentees: URiM Mentors: Non-URiM	Dyad	Survey	High rating of satisfaction in both mentees (5.1 out of 7) and mentors (6.4 out of 7) Mentees met with mentors an average of 3× in 1 year Valued group meetings	N/A
Johnson[54] (1998)	Post-survey	Mentees: Medical students,	Mentees: African American and Hispanic	Unspecified	Academic outcomes	Percent of URiM students obtaining honors increased	N/A

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Table 1. (continued)

Study (year)	Study design	Program participants	Participant demographics	Mentorship model	Program evaluation	Evaluation results	Average study quality score[a,b]
		advanced trainees, faculty Mentors: Faculty	Mentors: Unspecified			with 3 of the required clerkships Outcomes for faculty and advanced trainees not available	
Cregler[53] (1993)	Descriptive	Mentees: 37 medical students Mentors: 13 faculty	Mentees: Black Mentors: Black	Dyad	Unspecified	Students valued their mentors	N/A
Peterson[52] (1992)	Descriptive	Mentees: 43 medical students Mentors: 26 faculty or community physicians	Mentees: Black Mentors: Black	Dyad	Unspecified	Students valued academic support, insight into clinical rotations and private practice, role model professional and personal balance, and enhance medical school experience	N/A

URiM, underrepresented in medicine; ENT, ear, nose, and throat; RCT, randomized controlled trial; NIH, National Institutes of Health; K awards, NIH Career Development Awards; RO1s, NIH Research Project Grants; HIV, human immunodeficiency virus; MD, Doctor of Medicine; PhD, Doctor of Philosophy; AIDS, acquired immune deficiency syndrome

[a]*Quality assessments were performed for those publications with study designs for which a validated quality assessment scale exists*

[b]*National Heart, Lung and Blood Institute (NHLBI) Quality Assessment Tools for Controlled Intervention Studies and for Before-After Studies with No Control Group quality scores reached by consensus of two authors after applying scale*

[c]*CASP checklist results indicate that results of the qualitative study included are valid and can be applied to local populations*

Several novel models of mentorship were described by publications in this review. One program described a Peer-Onsite-Distance model which featured peer mentors who were close to the mentee in rank; senior faculty as on-site mentors to serve as advocates, liaisons, or coaches; and distance mentors who are leaders in healthcare, business, academia, or political settings.[40] Another approach featured a cascading mentorship model in which eight or nine senior faculty members were each paired with multiple medical students, who in turn, mentored two or three undergraduate university students, who then mentored a group of five high school students.[36] The mosaic model, which was aimed to increase the sex and racial/ethnic diversity of researchers in aging, described a research program that featured individual research mentoring, career coaching, and counseling from the program director and other senior female faculty members.[47] The last model utilized a "community of mentors" scheme, which was operationalized through a three-tier system that gave faculty basic logistical information, and skills appropriate to their developmental needs, and conducted institutional initiatives to enable committed professional relationships.[42]

Program Objectives and Components

Nine of the 28 programs described in our study sought to improve research skills of mentees.[26–28, 30, 32, 38, 43, 44, 46, 49, 50, 54] Ten of the 28 programs were intended to increase representation in a specific content area.[26, 28, 30, 32, 33, 37–39, 47–49] Five programs designated recruitment and retention of URiM mentees as one of their primary program objectives.[25, 39, 40, 42, 45, 54] For six programs, their goal was to provide support to mentees through their mentorship programs[34, 35, 41, 42, 53, 55]

Two publications aimed to further mentorship research: one described a new mentorship model that could be adapted to other insitutions,[40] and the other was an RCT that evaluated whether mentorship models satisfied psychological needs.[23] Other program objectives were to develop leadership skills and opportunities,[36, 42] teaching skills,[36, 46] clinical skills,[36, 48] and cultural competence;[52] train mentors,[55] enhance socialization,[52] and networking;[24, 48] and to orient junior faculty to the division.[24]

Evaluation Methods and Results

Fourteen programs utilized a survey-based assessment.[23–28, 30, 32, 34–36, 38, 42, 51, 55] The seven programs that assessed reported satisfaction and perception of the value of the program found high satisfaction and value ratings[24, 26, 28, 34, 35, 51, 55] The previously mentioned RCT comparing mentor training, peer mentoring, combined peer mentoring and mentor training, and usual mentorship found no difference in satisfaction at 12 months between groups; moreover, all groups had high satisfaction ratings.[23]

Ten programs assessed academic productivity including grants received and peer-reviewed publications.[26, 27, 30, 32,

[39, 42–44, 47, 49, 51] Though these papers list the number of manuscripts and grants, no comparison group is available.

Three programs addressed recruitment.[26, 33, 41] One found that their program was associated with increased number of residents of URiM backgrounds in their otorhinolaryngology program compared to prior years,[26] one revealed an increase in their URiM faculty members from 2 to 4 compared to prior to the program,[33] and another reported an increase in URiM faculty from 6.9 to 7.5% prior to the implementation of the program.[41] One program reported no change in percent of URiM faculty at any rank, though it had a 60% increase in promotion rates compared to prior to the program.[42] Three additional programs reported on promotions associated with their programs, and while all demonstrated successful promotion of some mentees, no comparison group is reported. Four programs addressed retention of URiM faculty: one reported that 100% of mentees in their preceptorship program were retained at their institution compared to 33% who were not paired with a preceptor;[24] another reported that their 5-year retention rate increased to 58% from 20%;[41] and one study reported that they retained five out of nine URiM faculty in research-based academic careers.[47] The National Center for Leadership in Academic Medicine program at University of California, San Diego, reported on their results over time in three separate publications. Their initial publication reported that five out of six URiM faculty mentees were retained and 100% of URiM faculty stayed in academic medicine.[25] Three years later, they reported that there was an increase in 4-year retention rate of URiM junior faculty from 58 to 80%,[45] and their publication 5 years later revealed that 83.3% of mentees were retained in the institution and 88.9% were retained in academic medicine.[56]

Barriers/Challenges

Most of the barriers identified by the programs in this review were intrinsic to mentoring programs in general: such as barriers related to programmatic logistics, mentor matching, and communication. Importantly, only one program identified lack of minority faculty to serve as mentors as a barrier.[54]

Facilitators

Having institutional support, including a greater mission for diversity, was a theme that emerged from those programs that described facilitators broadly for their mentorship programs. For example, programs cited support from senior members of their department[46] or from institutional leadership,[35, 36, 42, 46, 47, 54] financial resources for salary parity for URiM faculty, and assistance in mentoring and sponsoring URiM faculty to assume leadership.[33]

Other facilitators included training of mentors through workshops[35, 55] or written materials[42, 54] provided to mentors. Another noted facilitator was having mentors or role models from similar gender and cultural or racial backgrounds.[36, 43]

Key Themes

The four key themes that emerged from our systematic review are as follows: first, that alignment of mentorship programs with institutional goals and resources is crucial for sustainability and achievement of program aims. Second, mentorship programs should be tailored to specific institutional needs in order to optimize available resources. A third key theme is that lack of racial/ethnic concordance between mentor and mentee did not adversely impact mentorship program success or participant satisfaction. The fourth key theme was the importance of training mentors to ensure program effectiveness.

DISCUSSION

Our comprehensive search identified 31 publications describing 28 programs for URiM physicians and trainees in academic medicine. The recent crystallization of racial injustice in the USA and the disproportionate burden of these harsh realities on URiM physicians compared to physicians in majority groups may make our results of particular relevance to academic institutions aiming to support URiM physicians. Four themes for the development of mentorship programs for URiM physicians and trainees in academic medicine emerged from our review. The existing literature does not allow us to be able to clearly elucidate which practices are comparatively more effective than others. However, included study results consistently demonstrate that mentorship programs had a positive impact on participants, and no results of any included study present evidence that contradicts these four themes. The lessons from these themes can be applied in institutions who desire to develop or improve mentorship programs for URiM physicians. Furthermore, given the adverse financial impact of COVID-19 on academic medical centers, these themes can help inform programs to effectively spend whatever money is available for mentorship.

One theme revealed in these data is that alignment of mentorship programs with institutional goals and resources is crucial to sustain efforts to foster an environment of diversity and inclusion. This is consistent with a previous cross-sectional survey of academic departments of medicine that investigated strategies to enhance diversity, and found that a primary factor in the recruitment and retention of URiM faculty was institutional support (e.g., development awards, recruitment packages, salary support).[59] The institutional support had the added benefit of contributing to an overall climate of inclusivity that encouraged URiM faculty recruitment and retention. In addition to improving the overall climate of diversity and inclusion, institutional support also places the onus on institutional leadership, rather than on individual faculty members, to put diversity efforts at the forefront of their mission.

A second theme is that mentorship programs should be tailored to address local needs and to maximize available

resources. As with prior reviews evaluating mentorship in academic medicine[60] and mentorship of women in academic medicine,[21] the dyadic model of mentorship was utilized most, though peer and group mentorship were used when appropriate to the mentorship program's needs and goals. For example, citing a shortage of traditional mentors in their division, junior faculty at the Emory Division of General Internal Medicine created a facilitated peer mentorship and skill-building group.[46]

Another intriguing feature in this review was the use of novel models of mentorship. The cascading model of mentorship[36] allowed for the amplification of the reach of faculty and URiM medical students by pairing groups of high school students with pre-med undergraduate students, and those undergraduate students with medical students who were themselves mentored by faculty. This model could be adapted for institutions who have limited number of available faculty mentors. Similarly, the Peer-Onsite-Distance model of mentorship paired one faculty member with a peer mentor, a senior mentor, and a distance mentor, which allowed for the different facets of each mentee's needs to be fulfilled by the mentor best suited for each role, and therefore minimized the needed resources for the individual mentors.[40] Tailoring mentorship programs to an institution's resources requires careful reflection on the intended purpose of the program, and careful planning of logistics.

A third theme that emerged is that a lack of racial/ethnic concordance between mentor and mentee, while not perhaps ideal, did not adversely impact satisfaction with, or success of mentorship programs. Though few of the programs included in the review exclusively used URiM mentors, only one study cited the lack of senior URiM faculty as a limitation of their program[54] while all programs that assessed satisfaction were met with high satisfaction scores. The results of this review add to the growing body of literature that suggests mentorship of URiM physicians and trainees can be effective even if the mentor is of a discordant background. An implication of this literature is that institutions could benefit from increasing the number of non-URiM mentors who mentor URiM physicians and trainees. This would have a dual effect: increasing the pool of faculty mentors for URiM trainees and physicians, while addressing the systematic "minority tax," or the series of additional responsibilities often placed on URiM faculty, including additional administrative roles that may limit time available to further their own careers.[61] By more equitably distributing the mentorship roles among URiM and non-URiM faculty, URiM trainees and junior physicians receive more opportunities for mentoring, and URiM faculty may have more time to pursue academic advancement.

The last theme from our review is that it is essential to train potential mentors to ensure effectiveness for all mentees. This is consistent with prior literature that has linked faculty development in mentorship with increased mentee satisfaction.[62] Though this review did not aim to describe the specific skills that can contribute to success in an individual mentorship relationship, a variety of other resources and existing programs are available that can be generalized and adopted at various institutions according to their needs.[63, 64] An important next step in mentorship research is the assessment of best practices for success in individual mentorship relationships involving participants from discordant backgrounds.

We identified several limitations, many of which are specific to the individual programs that met our criteria but are also inherent in the mentorship literature in general. The first is that most programs did not include a control group and had small sample sizes. Second, programs were predominantly assessed through measures of satisfaction rather than quantitative methods of evaluation. Third, due to the lack of a standardized, validated quality and bias measure for descriptive study methodology, neither a quality assessment nor a bias assessment was able to be performed for most studies. This is true for other systematic reviews of the mentorship literature[20, 21, 60] and reflects that methods used for most mentorship studies are primarily descriptive. It is notable that where we could apply a validated quality measure, study quality was fair to good.

In conclusion, we identified 28 mentorship programs for URiM physicians and trainees, many of which followed the traditional dyadic model of mentorship, though some more recent programs employed novel models. Several themes have emerged through review of this literature, relating to the importance of institutional support, using resources and needs effectively, making use of both URiM and non-URiM mentors, and ensuring mentors are well-trained. Further research is needed in best practices regarding individualized mentoring relationships with participants from discordant groups, and the development of programs that address trainees and physicians from more than one underrepresented background. Overall, our results demonstrate the importance of further development and implementation of mentorship programs nationally, to more effectively enhance the number and success of URiM physicians across the career spectrum.

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