

A Scoping Review of Health care Faculty Mentorship Programs in Academia: Implications for Program Design, Implementation, and Outcome Evaluation

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Introduction: Formal mentoring programs have direct benefits for academic health care institutions, but it is unclear whether program designs use recommended components and whether outcomes are being captured and evaluated appropriately. The goal of this scoping review is to address these questions.

Methods: We completed a literature review using a comprehensive search in SCOPUS and PubMed (1998–2019), a direct solicitation for unpublished programs, and hand-searched key references, while targeting mentor programs in the United States, Puerto Rico, and Canada. After three rounds of screening, team members independently reviewed and extracted assigned articles for 40 design data items into a comprehensive database.

Results: Fifty-eight distinct mentoring programs were represented in the data set. The team members clarified specific mentor roles to assist the analysis. The analysis identified mentoring program characteristics that were properly implemented, including identifying program goals, specifying the target learners, and performing a needs assessment. The analysis also identified areas for improvement, including consistent use of models/frameworks for program design, implementation of mentor preparation, consistent reporting of objective outcomes and career satisfaction outcomes, engagement of program evaluation methods, increasing frequency of reports as programs as they mature, addressing the needs of specific faculty groups (eg, women and minority faculty), and providing analyses of program cost-effectiveness in relation to resource allocation (return on investment).

Conclusions: The review found that several mentor program design, implementation, outcome, and evaluation components are poorly aligned with recommendations, and content for URM and women faculty members is underrepresented. The review should provide academic leadership information to improve these discrepancies.

Keywords: mentorship, faculty development, academic advancement, program design and evaluation

DOI: 10.1097/CEH.0000000000000459

To remain sustainable, academic medical institutions need to retain engaged and productive faculty members who can actively contribute to academic missions.¹ Mentoring programs have been associated with improved faculty ben-

efits, including better recruitment, heightened engagement, successful faculty promotion, improved retention, earlier career success, and positive beliefs about the institution's commitment to its faculty.^{1–3} Institutions that invest in and support mentoring programs benefit through increased academic productivity (increased clinical revenue, more innovative educational programs, increased research funding, etc.) and reduced risk of burnout.^{2–5} Mentoring programs can also help develop internal candidates to assume leadership roles, thereby retaining high-quality faculty who desire career growth and avoiding costly external recruitment processes.⁶ For all these reasons, academic institutions have been advised to prioritize the implementation of mentoring programs to increase role model availability and improve the quality of developmental programming for faculty doing teaching, service, and research.⁷

Past reviews of published academic health care mentoring programs have found that existing mentor programs have significant variability with key program design elements and fail to address typical program implementation and evaluation practices.^{1,8,9} These reviews were limited by the practice of synthesizing data for programs from mentee groups with very different career needs (transferability issues) and often failed to analyze the presence and quality of key program elements.^{1,8,9} One review targeting a specific academic group, academic physicians, found variability in reporting on factors such as

Disclosures: The authors declare no conflict of interest.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jcehp.org).

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mentor preparation, curricular design, program evaluation methods, and outcome reporting that could have affected the program results.¹⁰ It is unclear whether these results can be extended to programs for other faculty groups. These reviews have noted that decisions on mentor program support, such as institutional commitment, resource allocation (individual faculty time allocations and funding), return on investment, and leadership oversight, may also affect faculty outcomes if not properly implemented, but no clarity exists about how these choices are currently made.^{9–11} Other reviews suggest that the availability of unique faculty subgroups' programming, such as underrepresented minority and women faculty, may reflect disparities for mentoring for these subgroups.^{12–15}

We undertook a scoping review to analyze data from mentor program content elements, including mentor training, targeted participants, and several program design, implementation, and evaluation issues. Our research questions were to identify the strengths and weaknesses (or deficiencies) in the mentor program design, implementation, and evaluation elements, along with disparities issues for certain faculty groups, to identify gaps for program improvements. This information should provide value to local and national stakeholders while supporting and making choices for mentor program development. We also attempt to increase understanding about the linkage of mentor program goals and outcomes for future research opportunities.

METHODS

Prior to doing this research, we needed to have a common nomenclature about mentoring to assure that we chose the relevant mentor programs for our review; however, we found, early in our query, that there was little consistency in the literature about mentoring roles and their definitions. Given this lack of guidance by the literature, we came to consensus, after reading key references and deliberating as a group, on a glossary of mentor role labels and definitions to help guide reference selection and provide data entry consistency for the review (see Glossary in Table 1). Only four mentor roles in Table 1 were considered important to extract for the review given our focus on longitudinal academic career development: sponsor, career guide, career advisor, and counselor. Therefore, we excluded programs where mentor roles consisted of short-term interactions where it would be difficult to prove that they provided long-term career impacts (onboarding buddy, skills instructor, and consultant).

We chose the scoping review paradigm as most appropriate for our research goals because we were interested in consolidating mentor roles concepts and analyzing current practices in the design, implementation, and evaluation of mentoring programs.¹⁶ For the scoping review approach, we used a checklist derived from the Preferred Reporting Items for Systematic reviews—Meta-Analyses (PRISMA) specifically modified for Scoping Reviews (PRISMA-ScR).¹⁷ The PRISMA-ScR checklist is a process using 22 items to assure that reviewers follow best practices for different steps in the review process, such as using comprehensive search methods, systematic data extraction and cataloging, and appraisal of the evidence.¹⁷ To be included in the review, publications must have described structured programs to prepare mentees for traditional academic roles in health professions (teacher, practitioner, scholar/researcher, leader, etc). Programs must also have included sufficient detail in the program description to assure that the program meets our definitions for

mentoring, the program goals and activities were primarily targeted toward academic career development, and no other exclusions applied (see below). To be included in the review, programs must have completed one programmatic cycle, from implementation to the first evaluation point; therefore, they had to have at least one set of outcomes or results, regardless of the outcome type (eg, knowledge, attitudes, career achievements, or scholarly products). We included programs from all health care professions (medicine, nursing, allied health, mental health, dental, physician assistant, and pharmacy) because faculty in all of these programs have similar roles and a shared context of academic health care delivery, education, and research; therefore, we assumed developmental activities and outcomes to be transferable to each other's professional contexts. We were concerned that professions outside of health care would lack transferability because they lack these common elements.

Program reports (published and unpublished) were excluded from the review for the following:

1. Programs from outside of United States, Puerto Rico, and Canada
2. Studies prior to 1998
3. Programs mentoring only PhD students, medical students, residents, and fellows. However, programs with fellows or postdoctoral students (MD and PhD) (instructors and assistant professors) were included if the program focused on academic career development and included junior faculty members
4. One-time offerings (eg, workshops or seminars over several days) that have no follow-up mentoring
5. Opinion, perspective, national surveys, or theoretical works.

The rationales for the exclusion criteria are as follows. Programs from outside of the United States, Puerto Rico, and Canada are not easy to compare with those in North America because faculty career goals may vary based on the region of the world and country of origin (variability due to availability of educational resources, conflicts for teaching, differences among research and patient care roles, and differing health care system economics tied to medical education). Therefore, we found it difficult to make inferences regarding whether a successful mentor program in one region could be confidently translated to another.^{18,19} Because the medical schools accredited by the American Association of Medical Colleges (AAMC) work under similar educational policies and similar health care contexts, only programs from the United States, Canada, and Puerto Rico were included in the review. The start date of 1998 was chosen as a cutoff for the search because health care and educational contexts have evolved recently. We excluded programs targeting trainees because most of these mentoring sessions are focused on fundamental clinical/research skills rather than academic career development. In addition, because most trainees chose nonacademic and/or non-health care professional careers, it would be difficult to assess a program's impact on those who became academic faculty. Short-term mentoring roles, one-off training seminars, and workshops were excluded because they are less likely to affect long-term career trajectory.

After establishing a glossary of terms and exclusion criteria, we performed several cycles of searches and screenings (detailed in **Appendix A, Supplemental Digital Content 1**, <http://links.lww.com/JCEHP/A179>). Briefly, the process to identify data to

TABLE 1.
Glossary of Labels and Definitions for Mentor Roles

NOTE: Mentor programs represented in this scoping review predominantly include more than one of the following mentor roles while delivering program content. Programs were selected for the review only if they included mentors who had a sponsor, career guide, career advisor, and/or counselor role. These roles are nonoverlapping, more than one can be taken on by one person and are not tied to institutional roles (ie, the mentor may have an authority role with mentee or can have no power relation, such as a peer).

Onboarding buddy: For this role, a faculty member (sometimes referred to as “mentor” in the literature) orients a mentee who is new to the institution and helps him/her adjust to academic duties and organizational culture and provides the initial resources to support the transition. This is a brief interaction and ends after the onboarding period.⁹⁸

Skills instructor: For this role, a faculty member (sometimes referred to as “mentor” in the literature) helps the mentee develop one narrow set of skills within a career function (eg, only grant writing, only one laparoscopic procedure, etc). The skills instructor serves as a teacher for skill sets and are not involved with integrating all skills for that particular career. The skills instructor is engaged over a limited time until the skill set or portion of it is mastered.⁹⁹

Consultant: For this role, a faculty member (sometimes referred to as “mentor” in the literature) provides the mentee specialized insight into a time-limited task (eg, a project consultant may be brought in to provide advice and guidance on engaging specific research methods). Once the specific support is complete, the consultant is disengaged.¹⁰⁰

Sponsor: For this role, a faculty member (“mentor” as advocate) acts as a formal advocate for activities that serve as advancement opportunities for the mentee, including receiving academic honors, nominations for exclusive developmental opportunities, and supporting promotion. A sponsor will advocate for a mentee’s opportunities for advancement in whatever network of professionals they share. Sponsors may be from the same institution, across institutions, or through academic societies.¹⁰¹

Career guide (also referred to as “functional mentoring” and frequently referred to as “coach”): For this role, a faculty member (“mentor” as discipline master) supports a mentee’s development and identity around a broad group of skill sets that help with academic professional development. A coaching role does not include relationship building and a coach and, due to power relations, may have conflicts of interest with advice on career choices and helping advise with professional/personal balance. A career coach involvement is generally continuous throughout the faculty member’s career at the institution.⁹

Career advisor: For this role, a faculty member (“mentor” as advisor) becomes engaged when the faculty member is in need of career transition advice or is in academic trouble. An advisor helps the faculty member clarify his/her career goals, weigh potential benefits and risks of career changes, and guide through behavior or performance changes. The career advisor is usually periodically engaged when needs arise but generally is a longitudinal role.⁴⁷

Counselor: For this role, the faculty member (“mentor” as counselor) supports the mentee’s personal and professional development by providing insights into holistic professional identity, work–life balance, effective work choices, and burnout prevention. The counselor role works best if conflicts of interest are minimized and the counselor has professional and personal experience that is relevant to the faculty member. The counselor’s involvement can span over several faculty member career transitions and institutions.^{23,102}

be included in the review involved implementing a broad search strategy in two overlapping databases from January 1998 to December 2019 (PubMed and SCOPUS). In addition, other search methods were engaged, including a search of the gray literature, direct queries for publications, direct queries for unpublished programs, review of conference proceedings, and hand searching of past reviews.

Through consensus, we developed a data extraction spreadsheet to capture what we considered to be the key program characteristics key to successful programs. The initial spreadsheet items were developed based on our collective expertise and an understanding of the mentoring literature. Two reviewers (W.L.W. and N.R.) each performed a trial extraction with the initial spreadsheet. Based on feedback with the trial extraction, several items were clarified, and others added. The final list of 40 program characteristic data items is provided in Table 2.

Reviewers (authors and affiliates) were assigned to pairs, and each pair independently extracted data from the same group of publications. Reviewers were blinded to the identity of their partner and his/her data until both had completed their reviews. After data extraction was completed, the reviewer identities were unblinded, and the two reviewers examined differences in their data extractions and used consensus to resolve differences. A third reviewer could be called upon to resolve how the data should be recorded when the two reviewers could not agree. When more than one publication/resource in the database represents a mentoring program, the data from these multiple sources was consolidated and assigned to the same extraction team and reported as one program. No reviewer reviewed a publication on which she/he was an author. The final set of references included 66 sources (publications and interviews).^{15,20–84} A summary of the citation information for the 58 mentor programs is provided in

Supplemental Digital Content 2 (see **Appendix B**, <http://links.lww.com/JCEHP/A180>). Because some programs had multiple publications/resources in the database, there were 58 distinct mentoring programs represented in the data set. The final data set also included two unpublished programs.

During the data analyses and synthesis stage, we targeted two types of results. First, we wanted to provide a summary of mentor program characteristics; we postulated that we could provide a map of the current state of the key characteristics in the design, implementation, and evaluation of mentoring programs. Second, we proposed an analytic process of deriving and answering questions that would add to the current knowledge about the quality and comprehensiveness of mentoring programs and the principles that guide them. We derived these questions from prior experience, the mentoring literature, and hypotheses derived from reflecting upon smaller samples of data from the initial 20 extractions. The questions were collated, and the group reached consensus on which questions would have the broadest effect and were vital to addressing principles for mentoring program design. We answered the high-priority questions (primary data analyses) by examining the final data set items using quantitative counts (frequencies) and compared these with specific external standards. These comparative standards are in Table 3. We also included a secondary analysis of other program features where no firm external standards could be found but are recommended as important design considerations in the mentoring literature (burnout indicators, linkage of goals to mentor role selection, linkage of goals to outcome assessment, and linkage of resource utilization choices to program design).

This review was reviewed by the University of Georgia Institutional Review Board and was found not to be human subject’s research.

TABLE 2.
Mentoring Program Characteristics Captured During Data Extraction

Year of Publication/Interview	Level of Institutional Support: Informal (Grassroots); Local Institution; National Program
How the resource was identified (literature search; hand-searching reviews; solicitation by means of email/flyer, searching conference proceedings)	Mentor experience: peer; near peer; senior; more than one
First author/program director	Duration of program (for closed-ended programs) and number of meetings/sessions
School/academic health Center	CDC program evaluation steps metric: ⁸⁵ Engaged stakeholders during program design and goal setting. Clear/specific program description provided. Evaluation plan provided. Program evaluation evidence provided. Program evaluative evidence linked to goals. Evaluation findings disseminated to local stakeholders
Unit/department name	Intervals/numbers of cohorts (if closed-ended program)
Formal program name	Resources used (monetary and FTE)
Country	Scope/type of program impact: attitudes only; cognitive development; perceived career success; career achievements aligned with advancement; career achievements with institutional impact
Source material (journal, interview)	Return on investment analyses
Title of source (if published, article title)	Discipline/specialty of mentees
Program objectives	Number of participants (mentees and mentors) and demographics (if provided)
Model or framework used for program design	Mentoring fit mechanisms/matching (if any)
Any special mentee focus of program: Women; underrepresented minorities; clinical educators; PhD educators; researchers (various)	Career stage of mentee (early career, mid career, late career)
Types of mentor roles engaged (see Table 1 glossary)	Organization of mentoring relationships: dyad; triad; multiple dyad; team based; more than one
Mentor training provided	Specific captured outcomes: Perceived program effectiveness (quantitative and qualitative attitude assessments) Mentee improvement in knowledge skills (directly measured and self-perceived) Improved mentee networking capabilities or inclination to collaborate/seek mentoring in future Improved mentee networking capabilities or inclination to collaborate/seek mentoring in future Number of career achievements for professional growth—promotions, advancement, productivity Number of career achievements with significant institutional impact: grants, publications, presentations/scholarly works Other outcomes

RESULTS

From the list of program characteristics in Table 2, we focused our analysis on 16 characteristics that represented the data components for mentoring program design, implementation, and outcome evaluation, and these results are represented in Table 4. Of the mentoring programs reviewed, the majority focused on clinical educators (50%, 29/58) and clinical researchers (43%, 25/58), whereas fewer programs also focused on PhD researchers (24%, 14/58). Fourteen percent (8/

58) of programs specifically targeted women faculty needs and 12% (7/58) targeted underrepresented minority faculty members (URMs). Of the programs that specifically targeted women, five were mentoring programs exclusively for women, whereas the remaining integrated women faculty-specific needs into broader development programs. Two of the programs (3%, 2/58) integrated URM faculty needs into broader development programs locally; most of the minority-focused programs were nationally sponsored and specialty-focused

TABLE 3.
Questions Used to Organize Analysis Stage With Comparisons

Question	Comparative Standard
How often do programs clearly describe and identify needs of target audience?	100% ⁹¹
How often do programs provide clear and measurable goals?	100% ⁹¹
How often were the mentors provided training/orientation?	100% ⁸⁹
How often were women-specific and URM training offered	Proportion of women faculty members in medical school faculty—42.3% (additional distinction about this standard is in results and discussion) ¹⁰³ Proportion of URM faculty members in medical school faculty—11.4%; (additional distinction about this standard is in results and discussion) ¹⁰³
How well does the frequency of career stage of mentees (early, mid, late) match national data?	Based on current rank proportions (for medical schools, 8.9% instructor, 46.4% assistant professor, associate professor 20.4%, full professor 21.5%) ¹⁰³
How often are the CDC evaluation stages followed?	Number of 6 stages of program evaluation that were implemented ⁸⁵
How often are resource decisions supported and/or return of investment measured	100% for both ¹⁰⁴

TABLE 4.
Frequency of Program Characteristics From the Data Consolidation Stage

Characteristics	# Of Programs (N = 58)	%
Objectives of program explicitly stated	58	100%
Mentoring fit mechanism engaged	35	60%
Theoretical models or frameworks used for program development	27	47%
Mentor development, orientation, and/or training	19	33%
Return on investment	8	14%
Mentee special focus		
Clinical (MD/DO) educators	29	50%
MD/DO researchers	25	43%
PhD researchers	14	24%
Other faculty researchers	13	22%
Other faculty educators	9	16%
Women	8	14%
Minorities	7	12%
PhD educators	2	2%
Mentee discipline/specialty		
MD/DO	49	84%
Total not MD/DO or basic science	29	50%
PhD/Basic science	20	34%
Pharmacy	8	14%
Nursing	6	10%
Clinical psychology	6	10%
Public health	5	9%
Dentistry	2	3%
DVM	1	2%
Social work	1	2%
Type of mentoring roles engaged		
Career guide	55	95%
Multiple	24	41%
Career advisor	19	33%
Career counselor	11	19%
Sponsor	4	6%
Mentee development stage		
Early career	55	95%
Middle career	13	22%
Multiple stages	13	22%
Late career	4	7%
Organization of mentor/mentee relation		
One dyad	31	53%
Team or committee based	30	52%
Multiple structures	18	31%
Multiple dyads	13	22%
Triads	2	3%
Type of support		
Institutional	39	67%
National	13	22%
None	8	14%
Mentor experience		
Senior	45	78%
Multiple	23	40%
Peer	17	30%
Near peer	9	16%
No. of cycles*		
One	26	45%
>Four	12	21%
Four	4	7%

(Continued)

TABLE 4.
Frequency of Program Characteristics From the Data Consolidation Stage (Continued)

Characteristics	# Of Programs (N = 58)	%
Two	3	5%
None	3	5%
Three	2	3%
No. CDC program evaluation steps engaged†		
Five	22	38%
Four	21	36%
Six	6	10%
Three	3	5%
None	2	3%
One	2	3%
Two	2	3%
Types of outcomes reported		
Multiple included	45	78%
Attitude	44	76%
Career achievement	43	74%
Institutional impact	34	59%
Cognitive skill	27	46%
Career satisfaction	12	21%
None	0	0
Specific outcomes captured		
Mentee assessment of program quality	42	72%
Impact on future mentor engagement	37	64%
Career achievements for advancement	37	64%
Knowledge/skill attained—self-reported	30	52%
Career achievements with institutional impact	30	52%
Mentor assessment of program quality	12	21%
Knowledge/skill attained—measured directly	4	7%

*The number of intervals (typically distinct mentee cohorts) the program was run when the data were reported.

†The number any of the following CDC Evaluation Steps were included program evaluation: step 1: engage stakeholders; step 2: describe the program; step 3: focus the evaluation design; step 4: gather credible evidence; step 5: justify conclusions; and step 6: ensure use and share lessons learned.

programs. Most of these programs failed to describe whether their faculty minority status was identified with the AAMC 2003 definitions for identifying URM status by local or regional standards. Given this lack of clarity, we used the pre-2003 AAMC definition based on reported ethnic and racial identity (African American, Hispanic, and Native American) because programs in the review did supply this information.

Nearly all (95%, 55/58) of the programs had designs to meet the needs of early career (instructor and assistant professor) faculty members, and the most common program participants (84%, 49/58) were clinicians (MD/DOs). Twenty-two percent (13/58) of programs included midcareer (associate professor) participants, and seven percent (4/58) of programs included mentoring for faculty late in their careers (full professor), despite full professors representing 22% of faculty in academia (Table 3). Other program participant disciplines included PhD/basic science (34%, 20/58), pharmacy (14%, 8/58), and nursing (10%, 6/58).

All programs (100%, 58/58) clearly stated program objectives and provided some needs assessment methods, although only 47% (27/58) of programs reviewed indicated a theoretical model or framework as the basis of their program design. The approach to mentorship also varied across programs. Most

programs (95%, 55/58) engaged the career guide approach, although a number of other types of mentoring roles were represented across the programs, including career advisor (33%, 19/58), career counselor (19%, 11/58), and career sponsor (6%, 4/58). Forty-one percent (24/58) of programs indicated the use of more than one type of mentoring role. There was no specific information provided about how the choices to engage these roles affected decisions for program design. Only one-third of programs (33%, 19/58) referenced mentor education or orientation. Of the 19 programs referencing mentor education, 11 required mentor education prior to program participation. Of the other eight programs, four offered preparatory education with mentors and mentees together and four offered separate mentor-focused training. Mentor education, when offered, varied and included activities such as introductory training, confidential peer support, tips for how to prepare for mentee meetings, and opportunities to further develop mentoring skills. Nearly two-thirds of programs (60%, 35/58) reported a mechanism for matching mentees to mentors.

Most programs (78%, 45/58) employed senior faculty as mentors, although peer and near-peer mentors were also reported. Forty percent of programs (23/58) indicated the use of multiple mentor methods per mentee, and these relationship structures varied and included dyad, multiple dyad, triad, and team or committee.

To assess reporting on essential components of program evaluation, we used the "Centers for Disease Control and Prevention's (CDC's) Six Step Framework for Program Evaluation."⁸⁵ We chose this metric due to its ability to provide a parsimony of items and yet allow reporting of all key evaluation activities. Just 10% (6/58) of programs used all six of the CDC's program evaluation steps. Fourteen percent (9/58) of programs used three steps or fewer. The numbers reported for each program evaluation stage were as follows:

1. Step one: engaging stakeholders during design: 72% (45/58)
2. Step two: clearly describing the program elements: 47% (27/58)
3. Step three: using a focused evaluation design: 21% (12/58)
4. Step four: gathering credible evidence: 76% (44/58)
5. Step five: justifying conclusion with data: 60% (35/58)
6. Step six: ensuring use and sharing lessons learned to stakeholders: 10% (6/58).

The most common components described was a combination of steps one and four: engaging stakeholders and gathering credible evidence 53% (31/58).

Attitudes and career achievements were the most common types of outcomes reported. Seventy-two percent (42/58) of programs measured mentees' assessment of program quality, whereas just seven percent (4/58) of programs measured changes in mentee knowledge or skill through direct assessment, and 52% (30/58) of programs relied on self-reported changes in mentee knowledge or skill. Career achievements (such as promotions or new leadership roles) were reported by 64% (37/58) of programs, and achievements with broader institutional impact (such as new grants, awards, or publications) were reported by 52% (30/58) of programs. Career satisfaction was the least common type of outcome reported (21%,

12/58), suggesting that programs infrequently monitored for whether program participation could reduce burnout or enhance resiliency.

It should be noted that of the programs included in our review, half (50%, 29/58) reported on two or fewer program cycles, so they were relatively new programs at the time of publication. Sixty-seven percent (39/58) of the programs received institutional support, and 26% (15/58) were supported by public and private funding sources, such as professional societies. Only 14% (8/58) reported any return-on-investment data to indicate whether faculty success and satisfaction made the financial investment worthwhile.

DISCUSSION

This review highlights findings of our scoping review of academic health care faculty mentor programs. Our review provided a glossary of mentor role labels and definitions to allow future programs a mechanism for selecting mentor roles and linking them to program goals and provide researchers as a way to standardize research data analysis. Our primary inquiry (research questions) was to find strengths and gaps in existing mentor program elements to provide targets for future program improvements. In general, most programs seem to identify their target audiences well, performed needs assessments, and are consistent with providing clear program goals and objectives. Our review did find several gaps for improvement with mentor program design, implementation, and evaluation that should inform key stakeholders. One key finding is that the primary target audience of the mentoring programs described in the literature are clinicians, with only a few programs targeting PhD researchers. In addition, a large majority of the programs focused on early career faculty with many fewer programs supporting late career faculty. Also, several educational program design choices failed to include components that we determined to be important for program success. There were also few reports on matured mentoring programs because most of the programs only reported on one or two cycles. There was also little consistency when reporting outcome types and linking their program goals to outcomes using a comprehensive program evaluation. These results have been suggested in prior research but not addressed within a scoping review paradigm with such a large sample as reported here.

It is well documented in the literature that women faculty members and faculty who are from minority groups (URM) that are traditionally underrepresented in academic medicine experience more barriers to success in academic medicine compared with men from majority groups.^{66,86–88} Despite prior studies suggesting that women and URM faculty members need customized mentoring programming given their growing numbers in academia, our review confirmed that only a few programs exist focusing on their specific mentoring needs. Our review found only nine programs that were focused on supporting URM faculty, of which only two were locally supported, suggesting limited access for this group to mentoring programs that target their needs. The paucity of specialized mentoring programs for URM faculty is of great concern because there is a heightened urgency for all academic institutions to increase initiatives to facilitate the representation and retention of this faculty group.

Only in about one-third of programs did mentors received specialized mentor education. In addition, programs did not

always provide clarity on mentors' roles, and when the mentor roles were explicitly stated, they were not clearly aligned with goals of the programs. Mentors who served in various programs were from different career stages (senior, peer, near peer, etc), and mentor/mentee relationship structures and ratios varied dramatically. Mentor education is important because there is a growing sentiment in the mentoring literature that to be effective, mentors need specific development activities focused on how to be "humanistic mentors".⁸⁹⁻⁹¹

Few programs provided evidence to support choices they made regarding career stage of the faculty member or the chosen program structure. Outcome measures were inconsistently captured and often subjective. Few reported data on mentee career satisfaction (such as burnout and resilience), and programs rarely included data on the return on investment. For several of the areas we examined through our review, there were not benchmark standards that we could use to compare different program components and approaches (eg, mentor relationship structures, mentor experience, and matching mechanisms), limiting the ability to draw conclusions beyond reporting frequencies.

Although many programs were effective in assessing mentee needs and providing clear program objectives, most programs did not use a theoretical framework or evidence-based model in the development of their program. The literature indicates that, while designing curriculum for mentoring programs, a theoretical foundation should be used, thereby ensuring the development of mentoring relationships and roles that can be tracked to program goals.⁹² Having an underlying theory helps provide an infrastructure upon which program elements can be designed and, with a lack of such, may lead to a weaker program design and reduced program impact.⁹² The number of theories or frameworks that can be used for designing longitudinal mentor programs are too numerous to review here, but examples of broader theories that could be engaged for program design include situated cognition and situated learning.⁹³⁻⁹⁵ Other examples of more specific frameworks used by the 47% programs who did mention them include the mixed matrix model, novice to expert theory, the developmental network framework, and experiential learning.

Future programs should have conceptual models or a learning theory as guiding frameworks, educational program designs that use best practices, and a clear assessment plan. Clarity of roles for mentors should be a central focus, as should training mentors in these roles and responsibilities and assessing the quality of mentoring provided. Program design elements, such as mentor career stage and mentor/mentee relationships structures and ratios, should be carefully chosen through both theoretically grounded and evidence-based mechanisms.

Mentor program success is best measured with concrete outcomes and assessed through the implementation of a thorough program evaluation. A program evaluation links these outcomes back to program goals, thus assessing the program's efficacy.⁹² Assessment approaches should also be carefully considered and should include (1) self-reports from both mentors and mentees, (2) objective assessments of program satisfaction, attitudinal change, skill acquisition, and advancement/promotion/leadership acquisition, and (3) the creation of scholarly products, such as manuscripts, grants, curriculum development and others.⁹² Other potential targets for program outcome evaluation include measuring career satisfaction

metrics to ensure that achievement-based outcomes did not come at the cost of burnout and have a focus on personal accomplishment and resilience.⁴

Our review also found that mentor program leadership would be well advised to include data on return on investment and clear linkage of resource choices for program activities; this will be relevant to institutional leaders when deciding to support a program. Few programs included any data on this topic. Funding mechanisms are also diverse and did not always appear sustainable, which can weaken the longevity of programs and their impact. The resources included in the review rarely provided rationales for how budgetary decisions were made and funds specifically allocated. Funding sustainability are critical for programs addressing the needs of academic health care faculty.⁹

Most programs were relatively new, and longitudinal tracking of impact is needed over time to confirm their outcomes. Furthermore, using CDC program evaluation steps could contribute to the strengthening of these programs and the assessment of their impact to help link goals to outcomes.^{85,96} We found no other prior publications addressing the programmatic issues described above with a broad sample and analyzed in a systematic way.

It is important to assess where this review fits into the existing mentoring literature as mentoring program implementations have recently been increasing in frequency. In 2006, most programs focused on medical students, and there were few faculty mentorship programs; Fewer than 20% of faculty members at that time had a mentor, and few faculty-focused studies were available to review.¹ Also, the review of Sambunjak et al focused on synthesizing program outcomes rather than on program design elements. A later review did focus on mentor programs designed for a particular subgroup (physicians) and found seven programs that used different mentoring models, but the review focused on comparing only a few program elements for each of the programs.¹⁰ This review was focused on a smaller subgroup than our data set but did align with some of our findings about policy and design features.¹⁰ Other reviews were focused on mentorship of women or URM faculty.^{12,13,15} Their analyses were also predominately outcome focused rather than focused on program design issues.^{12,13,97} Their findings of disparities in the availability of mentoring for these groups align with our findings. The concept of needs-focused mentor design is important for diverse faculty groups; one such review of mentorship of women in medical academia (n = 20 articles) indicated that their participants demonstrated increased scholarship and were more likely to be promoted and retained.⁹⁷

The review of Farkas et al found high mentee program satisfaction rates with program experiences with a majority of the studies, which was consistent with our findings; however, reporting of objective outcomes was not found in that review.⁹⁷ Another review of mentorship programs (which was helpful in developing our mentor labels and definitions) focused on traits and roles of mentors but was not specific regarding search and analysis methods.⁹ Our effort to provide a clear glossary and role definitions may help bring about some consistency in the literature and help with choices during program design. Taken together, these reviews of mentorship programs highlight the need for more breadth and depth while doing review of these programs. We attempted this approach in our review.

The strength of this scoping review is in its comprehensive approach. Our review synthesized data points across a large number of program components, such as target audience, objectives, mentor roles, mentor/mentee relationship structures and ratios, mentor training, theoretical models (or lack thereof), and multiple outcomes and evaluation activities. It also compared results with concrete and suggested standards for mentor program design, implementation, and evaluation, to identify gaps for improvement.

Our review did suffer some weaknesses. First, the programs that included disciplines, such as nursing, pharmacy, and allied health, were nearly all interdisciplinary programs with medical school faculty; thus, the state of programs for these as independent disciplines were less certain. In addition, there may be international programs that could inform our knowledge about mentoring beyond what we found in this review, but given their diverse contexts, no clear mechanisms existed to discriminate and select these programs for inclusion in our review. Also, our assumption that the data reported here are generalizable to all academic health care mentor programs in the United States, Canada, and Puerto Rico could be invalid; however, our exhaustive search methods and large number of programs represented here should mitigate this risk. There may have been program leaders who accomplished a program design component but failed to report it in their publication. Finally, for some standards listed in Table 3, especially the standards for women and URM faculty members, the numbers provided were only rough approximations to compare existing offerings and do not allow a direct comparison.

In summary, the results of this review imply several recommendations for future mentor program development: (1) improving accessibility to specialized mentor programs for faculty with unique developmental needs (Senior Faculty, URM, and women faculty); (2) using frameworks or theories during program design; (3) clarifying which mentor models (eg, team-based) and which mentor roles (eg, career advisor) are needed and engaged based on needs assessments; (4) providing mentor training and/or briefing; (5) completing a full program evaluation using best practices and lining these back to program goals; (6) providing more comprehensive reporting of outcomes including those with institutional and personal (ie, burnout) impact; (7) reporting updated findings once programs are more mature; (8) clarify budgetary needs to implement programs and their sources, and; (9) reporting return on investment.

Future research is needed to investigate effective components of mentorship program design and its contribution to program success. To accomplish this, more rigorous program evaluations must be implemented. Through the long-term tracking of participant outcomes, stakeholders should have a better understanding of the impact of mentoring programs on an individual's long-term career outcomes, such as attaining a leadership role, faculty retention, work satisfaction and burnout, and attaining promotion. In addition, more qualitative research that investigates the experiences of mentees and mentors is needed to determine what components of the mentor/mentee relationship are perceived to be the most valuable to career progression and using these to inform engaging specific mentor roles during program design. More details about the budget and salary support are needed for implementation decisions and return-on-investment calculations, which would allow for a better understanding of the institutional resources

required to achieve institution-level outcomes by its faculty members.

Lessons for Practice

- This review provides a glossary of mentor role labels and definitions to enhance future mentor program design and research
- Although successful in identifying targeted audience and needs, most mentor program designs fail to address several other recommended program design practices, indicating opportunities for improvement
- Very few mentor programs are designed to meet the unique needs of women faculty, URM faculty, and senior faculty members.

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