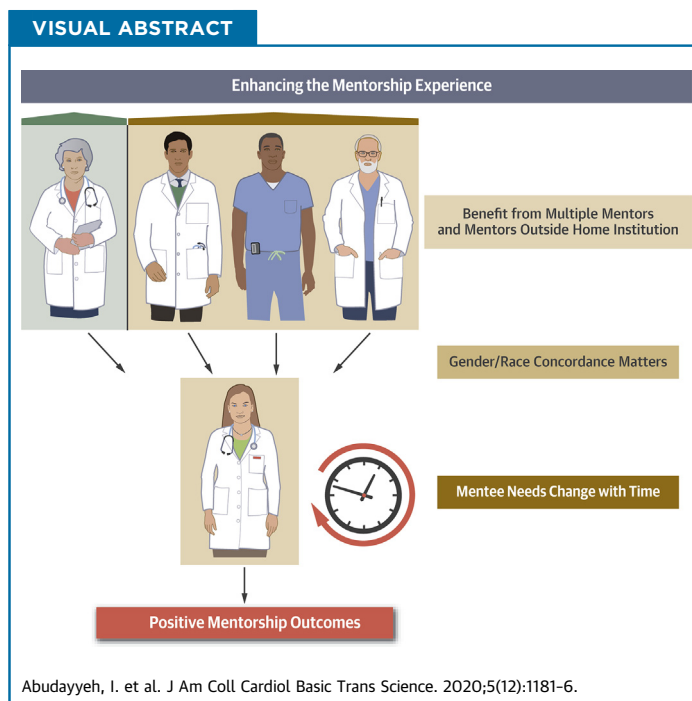


CLINICAL RESEARCH

Landscape of Mentorship and its Effects on Success in Cardiology



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HIGHLIGHTS

- Mentees are more satisfied with their mentorship experience when they have had more than 3 mentors or a mentor from outside of their practice/institution.
- Satisfaction with the mentoring relationship is significantly associated with perceived satisfaction in achieving professional goals.
- Sex and race/ethnicity concordance in mentoring relationships is associated with positive outcomes.
- Characteristics that mentees desire in a mentor tend to change with time/career stage.

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ABBREVIATIONS AND ACRONYMS

ACC = American College of Cardiology

NIH = National Institutes of Health

RVU = relative value unit

SUMMARY

The effects of mentorship on measurable outcomes of success and the aspects of mentorship that are most valuable in promoting the careers of cardiologists are unclear. To address this, we conducted a large-scale survey of cardiologists in a real-world setting. We identified factors that enhance the mentorship experience, and found that mentee needs change with career stage. Importantly, satisfaction with the mentoring relationship is significantly associated with perceived satisfaction in achieving professional goals. Furthermore, we found that gender and race concordance in mentoring relationships is an important variable with the potential to increase diversity in the field of cardiology.

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Mentorship is often perceived as critical for success in academic medicine as well as private practice. Cardiologists at all levels, especially during their early career, face challenges when it comes to advancing in research, teaching, and clinical practice development (1,2). A mentor is traditionally considered to be a senior colleague who has established knowledge or skill in a particular area and is willing to share that knowledge while helping to promote the career of a more junior physician. It is reasonable to speculate that guidance from multiple mentors, each focused on a specific area, may be needed for success. Indeed, mentorship is often touted as a vehicle for success, particularly in academics, and is promoted in teaching centers and national societies. Mentorship has been described as a “major strategic priority” and as “encompassing a variety of activities including advising, teaching, coaching, advocacy, sponsorship and role modeling, as well as assistance with personal development and achieving work-life balance” (3). Unfortunately, limited data exist regarding whether mentorship, or particularly which characteristics of a mentor-mentee relationship, is associated with quantifiable outcomes of success or satisfaction in achieving professional goals for early career cardiologists.

Another important question that has not been thoroughly investigated is how sex and race concordance between mentor and mentee influences outcomes of the mentorship experience. Despite a robust pipeline of female medical students and internal medicine residents, female physicians are underrepresented in adult cardiology (4). Furthermore, several racial/ethnic minority groups are underrepresented in medicine at all levels (4). Thus, a key question is whether increasing female and minority

mentors will lead to increased success and diversity in the field of cardiology.

To assess the value of mentorship and its perceived effect on multiple metrics, the Academic Working Group of the American College of Cardiology (ACC) Early Career Leadership Council conducted a real-world cross-sectional survey of ACC members across all sexes and career stages of academic and community practices. We then compared mentor number and mentorship satisfaction with quantifiable outcomes of success, such as grant funding, time to promotion, reaching relative value unit (RVU) goals, and overall satisfaction with achieving professional goals. In doing so, we provide quantitative and qualitative data on the current types and perceived benefits of mentorship and identify areas that need improvement.

METHODS

An online, 33-item, multiple-choice survey (see [Supplemental Appendix](#) for full survey) was emailed to a random selection of 4,883 ACC cardiologist members in the United States to assess career mentor activity and success and to identify the areas of greatest need. The survey was open from February 7, 2019, to February 25, 2019. Respondents were given the opportunity to enter a raffle to win 1 of 4 \$250 Amazon gift cards. A total of 508 ACC members responded (10.4% response rate). Questions focused on demographics, mentor experience, metrics of success, professional development, and job satisfaction. For academic cardiologists, these included length of time to promotion, serving on a national committee, receiving a teaching or research award, or obtaining National Institutes of Health (NIH) R01-level funding. For clinical cardiologists, these

TABLE 1 Respondent Demographics (N = 508)

Gender	
Male	78%
Female	21%
Ethnicity	
White	70%
Asian	19%
Black/African American	3%
Native American	1%
Native Hawaiian/Other Pacific Islander	>1%
Other	3%
Hispanic	
Yes	5%
No	93%
Tenure, yrs	
7 or less	25%
8-14	18%
15-21	15%
22+	38%
Academic appointment	
Yes	62%
No	37%
Practice setting	
Nongovernment hospital	38%
Medical school	31%
Physician-owned practice	23%
Government hospital	5%
Other	3%
Percentages may not equal 100% due to some respondents not answering all questions.	

included time to becoming a partner, achieving leadership roles, and reaching RVU goals sooner than expected. Participants were also asked to rate their satisfaction with the mentorship experience on a scale of 1 to 10 with 1 indicating not at all satisfied and 10 indicating extremely satisfied.

The survey was not sent to an institutional review board. The ACC conducts survey research consistent with the Council of American Survey Research Organizations Code of Standards and Ethics. The study was conducted consistent with generally accepted scientific principles and the principles of the Declaration of Helsinki, which is typically required in the absence of institutional board review. The ACC is

TABLE 2 Sex Distribution in Mentoring

Mentor	Mentee	
	Male (n = 385)	Female (n = 99)
Male	95%	70%
Female	5%	29%
n = 9 declined to provide mentee sex; n = 2 indicated other for mentor sex, and n = 2 did not answer mentor sex. n = 15 did not have a mentor and were not asked the question (p < 0.001).		

dedicated to disseminating research results and to conducting research in a manner that does not pose harm to human subjects.

All p values were calculated using chi-square, Mann-Whitney, and 1-way analysis of variance methods. Statistical analyses were performed using IBM Statistics for Windows version 25.0 (Armonk, New York).

RESULTS

DEMOGRAPHICS. The survey was completed by 508 ACC cardiologists with a response rate of 10.4%. Respondents were 78% men and identified as Caucasian (70%), Asian (19%), Hispanic (5%), and Black/African American (3%). There was a bimodal distribution of tenure, with 25% early-career cardiologists in practice for 7 years or less and 38% practicing more than 22 years. Location of primary practice was nongovernment hospital (38%), medical school (31%), and physician-owned practices (23%). Most respondents (62%) had an academic appointment (Table 1).

MENTORSHIP SATISFACTION IS ASSOCIATED WITH PROFESSIONAL SATISFACTION. Almost all cardiologists (97%) reported at least 1 mentor during their career, and many reported more than 1 mentor (3.64 average). Most respondents (90%) reported that mentorship was influential in their decision to pursue their current career track, with the stage of influence relatively evenly split between medical school, residency, and fellowship. Mentees were more satisfied with their mentorship experience (rated on a scale of 1 to 10) when they had more than 3 mentors (p < 0.001) or a mentor from outside of their practice/institution (p < 0.001).

We found that mentorship satisfaction is significantly associated with perceived satisfaction in achieving professional goals (p = 0.002). Interestingly, we did not find a significant association between number of mentors or mentorship satisfaction and objective outcomes. For academic cardiologists, these included length of time to promotion, serving on a national committee, receiving a teaching or research award, or obtaining National Institutes of Health R01-level funding. For clinical cardiologists, these included time to becoming a partner, achieving leadership roles, and reaching RVU goals sooner than expected.

SEX AND ETHNIC CONCORDANCE ARE ASSOCIATED WITH MENTORING SUCCESS. The majority of respondents in the survey (78%) were men. Further, the majority of respondents (90%) reported that the sex of their most influential mentor was male. However, when analyzed based on sex of the respondent, 29%

TABLE 3 Ethnicity of Mentor/Mentee

Mentor Ethnicity*	Mentee Ethnicity*					
	Asian (n = 92)	Black/African American (n = 15)	Hispanic (n = 26)	White (n = 344)	Other (n = 12)	Decline (n = 28)
Asian	39%	13%	12%	7%	8%	18%
Black/African American	1%	13%	0%	1%	8%	4%
Hispanic	3%	7%	27%	3%	17%	0%
White	69%	67%	62%	89%	58%	32%
Other	3%	0%	0%	3%	42%	0%
Decline	2%	0%	4%	2%	0%	50%

n = 30 declined to provide mentee ethnicity; n = 2 indicated Native American and n = 1 indicated Native Hawaiian/Other Pacific Islander for mentee ethnicity; n = 2 indicated Native American and n = 0 indicated Native Hawaiian/Other Pacific Islander for mentor ethnicity; n = 24 refused to provide mentor ethnicity; n = 15 did not have a mentor and were not asked the question. *Respondent could select more than 1 ethnicity.

of female respondents reported that their most influential mentor was female compared with only 5% of male respondents (Table 2). Therefore, although a greater number of mentors overall were men, a larger proportion of female mentees had female mentors ($p < 0.001$) compared with male mentees. Female cardiologists with female mentors reported greater satisfaction in achieving professional goals compared with those with male mentors ($p = 0.007$), as demonstrated by 41% of female mentees with female mentors stating that they were very satisfied on this metric compared with 25% of female mentees with male mentors. A similar pattern was observed for male cardiologists, although the proportion of male cardiologists with female mentors was low (5%). Gender concordance between mentees and mentors was not associated with objective outcomes such as length of time to promotion, receiving a grant, or serving on a national committee.

The ethnic distribution of most influential mentors generally mirrored those of the study participants. The majority (80%) of respondents described their most influential mentor as White, with Asians a distant second (14%). Only 3% of respondents reported that their most influential mentor was Hispanic/Latino, and 2% of respondents reported that their most influential mentor was Black or African-American. As with sex, we observed a propensity for racial/ethnic concordance in mentoring relationships, with 39% of Asians (36 of 92) reporting that their most influential mentor was Asian, and 27% of Hispanics (7 of 26) reporting that their most influential mentor was Hispanic (Table 3). For the purpose of analysis, racial/ethnic concordance was defined as both mentee and mentor as being either White or non-White. Based on this classification, racial/ethnic concordance was positively associated with hard outcomes of achieving promotion on or ahead of schedule

($p = 0.016$) and success in receiving grants ($p = 0.046$). Job satisfaction, serving on national committees, or perceived ability to achieve goals did not appear to be influenced by racial/ethnic concordance in the mentoring relationship.

CHARACTERISTICS THAT MENTEES VALUE IN A MENTOR. The survey respondents selected their top 3 important mentor characteristics. The top qualities chosen were: has seasoned experience in the field and is willing to share expertise (49%), leads by example (36%), has integrity (33%), has time and energy to devote to mentoring (32%), and creates opportunities (29%). Less than one-quarter of respondents chose these mentor qualities: provides constructive feedback (24%), knows mentee strengths and abilities (17%), and is respected in the professional community (16%). Less than 10% identified effective leadership skills and a reputation for developing others as high-priority characteristics.

Although seasoned experience and willingness to share expertise was an important mentor characteristic regardless of stage of the mentee, other desirable qualities seemed to vary somewhat based on mentee career stage. For example, early-career cardiologists (i.e., <8 years out of training) desired a mentor with time and energy to devote to the mentoring relationship more so than those who have been in practice for at least 22 years (45% vs. 25%). Those 8 to 14 years out of training valued a mentor who can create opportunities and open doors. The mentor quality of leading by example was increasingly important as respondents progressed from early to later career stages (Table 4). These observations highlight how the mentor-mentee relationship and goals may change over time.

DISCUSSION

Although it is generally agreed that mentorship is an important contributor to career advancement, little data exist regarding the nature of mentor-mentee relationships among early career cardiologists and how mentorship influences quantitative and qualitative outcomes of success in academia and private practice. Here, we conducted a real-world cross-sectional survey of over 500 ACC members to identify the real value of mentorship. Surprisingly, we found that neither mentor number nor satisfaction with the mentoring experience was associated with objective, quantifiable outcomes of success. This is consistent with a prior survey we conducted in 2016 showing that mentoring excellence did not correlate with National Institutes of Health funding (2). Although the reasons for this are likely multifactorial and related to

TABLE 4 Shifting Mentor Needs by Career Stage

	Total (n = 508)	7 Yrs or Less (n = 128)	8-14 Yrs (n = 91)	15-21 Yrs (n = 75)	22+ Yrs (n = 193)
Has seasoned experience in your field and willing to share skills, knowledge, and expertise	49%	45%	38%	47%	58%
Leads by example	36%	27%	34%	41%	42%
Has integrity	33%	25%	35%	24%	39%
Has time and energy to devote to mentoring	32%	45%	29%	29%	25%
Creates opportunities and opens doors	29%	31%	40%	35%	21%
Provides constructive feedback	24%	27%	15%	28%	25%
Knows your strengths and abilities	17%	21%	25%	15%	9%
Is respected by colleagues and employees in the organization and the professional community	16%	16%	11%	20%	18%
Has up-to-date knowledge	11%	9%	9%	5%	16%
Helps you navigate the politics and bureaucracy	11%	11%	12%	16%	7%
Communicates hope and optimism	11%	5%	16%	16%	10%
Has good contacts (a network)	9%	12%	14%	9%	4%
Has demonstrated effective leadership/managerial skills	7%	9%	5%	0%	9%
Has a good reputation for developing others	5%	8%	5%	1%	3%
Values the opinions and initiative of others	4%	3%	2%	4%	5%
Other	1%	0%	1%	0%	1%
None	0%	0%	0%	0%	1%
Not sure	0%	0%	0%	0%	1%

n = 21 with no training data.

overall decreases in National Institutes of Health funding coupled with increased competition for grants, we did find that satisfaction with the mentoring experience was associated with perceived satisfaction in achieving professional goals. The majority of respondents also stated that mentorship was an important factor in influencing their decision to enter their current career track, with this influence occurring as early as medical school and continuing throughout training.

Those with more than 3 mentors or with a mentor from outside of their practice/institution reported increased satisfaction with their mentorship experience. A higher number of mentors may reflect an increased likelihood of finding a “good fit” mentor or the benefits of having a diverse mentorship panel in which each mentor provides a different expertise or opportunity. Having a mentor outside of one’s practice or institution may reflect increased networking of the mentee or mentee movement, both of which might positively impact one’s career.

Interestingly, although the majority of influential mentors were, not surprisingly, classified as white men, we found that there was sex and ethnic concordance in mentoring relationships. An increased percentage of female respondents reported having an influential female mentor, and an increased percentage of minority respondents reported having an influential mentor of similar race/ethnicity. It is not clear whether these relationships form because mentees are seeking out mentors with a similar

background or whether mentors are more likely to devote time to mentoring someone that they feel shares a similar background, experiences, and cultural values. Of note, a 2010 academic medicine survey focused on diversity in mentoring revealed that Black, Hispanic/Latino, and female residents activity seek out mentors of the same race/ethnicity and sex, but expressed difficulty finding such mentors (5). Furthermore, data show that the lack of diverse faculty mentors may impede resident satisfaction and benefit from mentorship relationships among diverse residents (5). Similarly, we found that sex and ethnic concordance in mentoring were positively associated with satisfaction in achieving professional goals (sex concordance) or objective outcomes, such as time to promotion and receiving grant funding (ethnic concordance).

Our results also uncovered changing needs of mentees as they progress throughout their career. Although seasoned experience and willingness to share expertise was an important mentor characteristic regardless of mentee stage, early-career physicians also placed importance on time and energy a mentor devoted to mentoring, whereas mid-career physicians sought a mentor who is able to open doors. Senior cardiologists looked for mentors who lead by example. Thus, mentee needs seem to shift over time as a function of career development and perhaps changes in the practice of cardiology.

STUDY LIMITATIONS. First, of the 4,883 ACC cardiologist members who were contacted, only 10.4%

responded to the request. Thus, this survey may not necessarily reflect the opinions of all cardiologists. Second, the respondents were predominantly white men; <25% of the respondents were women and <10% of the respondents were Black/African American or Hispanic. Accordingly, the sample sizes for some subgroups in the sex and ethnic concordance analyses are small. Third, this was a cross-sectional study, and is thus limited in its ability to determine cause and effect.

CONCLUSIONS

A CALL TO ACTION. Taken together, these data suggest that it is extremely important for institutions and professional organizations to actively identify and encourage female and underrepresented minority cardiologists to serve as mentors and support their availability to trainees starting as early as the medical school stage. Although sex and ethnic concordance in mentoring relationships was associated with some positive outcomes, we are not discounting the benefits that can be derived from cross-sex or cross-ethnicity mentoring relationships. Indeed, it is quite striking that of 385 male respondents, only 19 (5%) reported having an influential female mentor. As more women enter the field of cardiology, hopefully this bias will change, and male cardiologists will seek out female mentors when appropriate. Efforts to increase the number and visibility of female and underrepresented minority cardiology mentors has the potential to shift the demographics within the field of cardiology and lead to increased diversity and sex balance.

AUTHOR DISCLOSURES

This work was supported by the National Institutes of Health (DP2HL137166 to Dr. Madhur) and the American Heart Association (EIA34480023 to Dr. Madhur). Dr. Abudayyeh has served as a proctor for Edwards Lifesciences: transcatheter valve. Dr. Freeman has served as a nonpromotional speaker for Boehringer Ingelheim; has served as a consultant for Actelion and Boehringer Ingelheim; and has served on the advisory board for The Medicines

Company and Regeneron. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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PERSPECTIVES

COMPETENCY IN MEDICAL KNOWLEDGE: Our survey identified important characteristics that mentees desire in a mentor, including seasoned experience and willingness to share expertise. Furthermore, we found that needs of mentees change with career stage, and thus the mentoring relationship needs to change and evolve to support career growth and success. Finally, we found that sex and race concordance in mentoring is associated with positive outcomes.

TRANSLATIONAL OUTLOOK: We identified characteristics that enhance the mentorship experience, including having more than 3 mentors and having mentors from outside of one's home institution/practice. Although our findings also support sex and race/ethnic concordance in mentoring relationships, sample sizes were small for some subgroups. Thus, additional research is needed to more thoroughly investigate the effect of sex and race on mentoring, career success, and professional satisfaction. In the meantime, institutions and professional organizations are encouraged to actively identify and promote female and underrepresented minority cardiologists to serve as mentors to help increase diversity in the field of cardiology.

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APPENDIX For a full list of survey questions, please see the online version of this paper.