

A Sustainable and Effective Mentorship Model for Graduate Medical Education Programs

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ABSTRACT

Background Mentorship models rarely seek generalizability across training programs at the graduate medical education (GME) level.

Objective We examined the sustainability and effectiveness of an intervention to increase the number and usefulness of trainee mentorship.

Methods A 0.20 full-time equivalent GME faculty adviser position (MD, MEd) implemented mentorship programs in residencies and fellowships. In group 1, 6 GME programs implemented the mentorship strategies prior to 2014, which were used to measure whether the number of mentor relationships were longitudinally sustained. In group 2, 10 different GME programs implemented the mentorship strategies in 2016, which were used to measure whether the intervention immediately increased the number of mentor relationships. To measure mentorship usefulness, trainees rated mentors' ability to promote clinical skills and personal and professional development. The remaining programs were the comparison. Responses from the 2014 and 2016 annual institutional trainee survey were analyzed.

Results The incidence of group 1 reporting mentor relationships in 2014 compared to the incidence of group 1 in 2016 were 89% (41 of 46) and 95% (42 of 44), respectively, suggesting that the intervention was sustained for 2 years ($P = .26$). Group 2 showed a higher proportion of trainees reporting mentors in 2016 (88%, 149 of 170) compared to preintervention (66%, 71 of 108; $P = .00001$). Groups 1 and 2 reported significant increases in mentorship usefulness.

Conclusions A GME initiative to enhance mentoring across specialties in 16 GME training programs was self-sustaining and effective.

Introduction

The benefits of successful mentor relationships between trainees and faculty have been well-established. A mentor is one who provides career enhancement and psychosocial support to another person.¹⁻³ Mentored trainees attain more publications and increased leadership roles.³⁻⁷ These relationships are mutually beneficial, because faculty mentors increase their academic productivity and career satisfaction.^{2,8} Rarely, though, have mentorship models been proposed for varied graduate medical education (GME) programs. We have previously described a GME-supported, 5-step mentorship plan to establish mentor relationships between trainees and faculty.¹ The pilot intervention increased the number of reported mentor relationships, and trainees with mentors were more likely to report overall program satisfaction and faculty support. Given the success of the pilot, we expanded our intervention to other programs.

The goal of this study was to quantify the long-term effectiveness of the mentorship intervention and its replicability across GME programs. There were 2 primary aims: (1) examine the longitudinal sustainability of mentor relationships within 6 GME programs, and (2) examine the effectiveness of the intervention on establishing new mentor relationships within 10 GME programs. The secondary aim was to describe differences in mentor usefulness between groups.

Methods

We conducted a prospective cohort study at Stanford University Medical Center and Lucile Packard Children's Hospital between January 2014 and January 2017. The institutions have more than 1000 medical trainees in 111 Accreditation Council for Graduate Medical Education (ACGME) accredited programs. A GME-funded faculty physician adviser (0.20 full-time equivalent [FTE]) with a master's degree in education for health professionals implemented a potentially generalizable, 5-step, evidence-based mentorship model in training programs outside of his department (TABLE).¹ The faculty adviser benefited from executive support from the designated institutional officials and collaboration from 2 GME program education

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Editor's Note: The online version of this article contains survey questions on the annual house staff survey, average ratings of mentor usefulness, and respondents of the 2014 and 2016 house staff survey, by intervention group.

TABLE

Evidence-Based Strategy to Improve Mentoring Deployed by Graduate Medical Education (GME) Faculty Advisor

Step	Description
1. Identifying program rationale	The GME adviser meets with the program director to provide a 1-hour interactive session, including recommendations for publicly available online curriculum. ⁹
	Goals - Emphasize the attributes of successful mentors, including emotional intelligence, empathy, humor, and patience. - Describe the benefits of effective mentorship to faculty.^{2,10} - Highlight that not all faculty members make suitable mentors, given the potential for apathy or incompatibility.²
2. Providing trainee education sessions	The GME adviser presents a 1-hour interactive session for residents and fellows in which trainees discuss the mentee role. ¹¹
	Goal Trainees recognize the need for active relationship engagement. This includes follow-through on tasks and solicitation of feedback that is shared with faculty.^{2,11}
3. Designing structured program	The GME adviser meets with program directors to initiate a structured mentorship program. Program directors solicited unpaid, volunteer faculty mentors. Trainees also enter into mentor relationships voluntarily.
	Goals - Address the common reasons for failed mentor relationships: forced relations, random assignment, and lack of trust.^{2,12} - Provide intrinsic motivation for faculty to volunteer to the program.
4. Developing mentor profiles	Volunteer mentor faculty develop profiles highlighting their personal and academic interests. Some programs hold in-person social engagements to introduce mentees to potential mentors. ¹³ Trainees use these profiles and engagements to identify shared interests and select mentors. ⁷
	Goal Avoid random assignment of mentors to mentees through voluntary participation and trainee selection of mentors.
5. Fostering mentor relationships	Mentors meet with residents at least every 4 months. ^{2,7} A discussion guide is distributed outlining 6 areas of effective mentorship. ² Each year, the program director reviews the mentor-mentee relationships and terminates relationships if necessary.
	Goals - Garner the trust necessary for effective mentor relationships through sustained, regular contact. - Offer just-in-time teaching to provide structure for meetings. - Facilitate change in mentor relationships as needed.

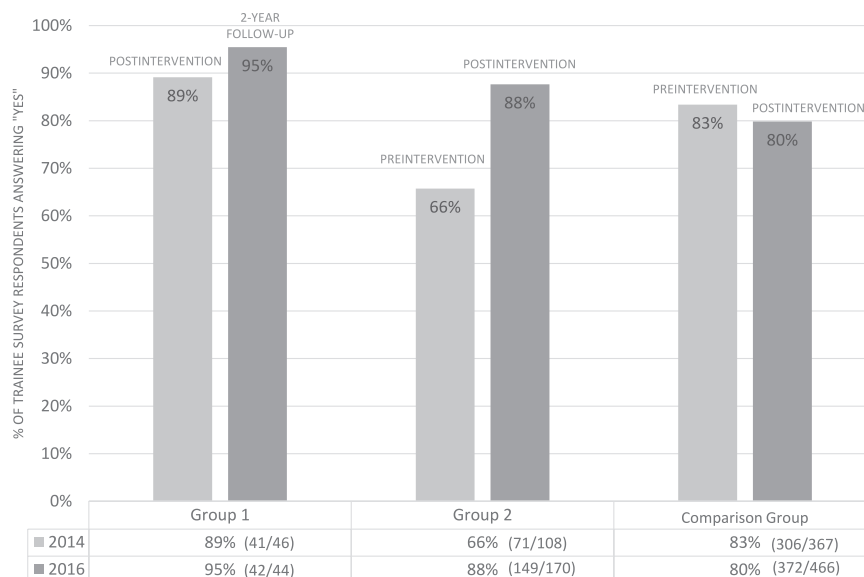
specialists. Built on Malcolm Knowles' principles of adult learning,¹⁴ the mentorship model highlighted experiential learning and self-directed motivation to encourage trainees and faculty to actively participate.

To ensure adequate diversity of training program size and specialty, 16 residency and fellowship training programs of various sizes and specialties were targeted for the mentorship intervention. These programs were separated into 2 groups based on the year of intervention:

Group 1: Six programs that implemented the mentorship strategies in 2014 and were analyzed in 2017 to measure long-term sustainability. These programs included medical genetics, neurological surgery, ophthalmology, pediatric anesthesiology, pediatric cardiology, and radiation oncology.

Group 2: Ten programs that implemented the strategies in 2016 and were analyzed in 2017 to assess intervention usefulness. These programs included endocrinology, emergency medicine, general surgery, geriatric psychiatry, neurology, rheumatology, obstetrics and gynecology, psychiatry, pathology, and urology. The remaining programs served as the comparison group.

Responses from the annual Stanford GME survey provided to all residents and fellows used identical questions to measure outcomes (provided as online supplemental material). The survey was developed by local education experts without further testing. Trainees reported the presence of a mentor and rated mentor usefulness on a 6-item Likert scale in 6 categories: clinical skill enhancement, posttraining

**FIGURE****Annual Institutional Survey Responses to the Question: “Do You Currently Have a Mentor?”**

Note: Proportion of group 1 trainees reporting a mentor in postintervention (2014) and at 2-year follow-up (2016); the lack of a significant decline suggests sustainability of program results. Comparing the proportion of group 2 and comparison group trainees reporting a mentor preintervention (2014) and postintervention (2016) shows a significant increase in reported mentorship in group 2 after the intervention and compared to the comparison group.

career planning, networking to increase opportunities for professional development, sponsorship and advocacy for trainees during training, research productivity, and mentoring on sensitive and challenging situations.²

The Stanford University School of Medicine Institutional Review Board approved this study.

SPSS 22 (IBM Corp, Armonk, NY) was used to analyze the results. Chi-square and factorial logistic regression tests were used to determine group differences between response rates and reported presence of mentors over time. Mean Likert scores were used to compare mentor usefulness between groups. *T* tests measured the mean ratings of usefulness of mentorship within the groups. Analyses were completed as cohort groups, not as individual programs.

Results

The 2014 GME survey was distributed to 1065 trainees, and 521 responses (49%) were received. The group 1 response rate was 56% (47 of 84), and the group 2 response rate was 43% (108 of 249). In the comparison group, 50% responded (367 of 735), which was not significantly different ($\chi^2 = 5.03$; *df* = 2; *P* = .08; provided as online supplemental material).

The 2016 survey was distributed to 1067 trainees, and 680 responses (64%) were received. The group 1 response rate was 51% (44 of 87), and the group 2 response rate was 67% (170 of 255), and 64%

responded (466 of 725) in the comparison group (provided as online supplemental material). Pairwise chi-square comparison demonstrated significant differences in response rates between group 1 versus group 2 ($\chi^2 = 7.173$; *df* = 1; *P* = .007) and group 1 versus comparison group ($\chi^2 = 6.242$; *df* = 1; *P* = .017).

A total of 339 of 1067 (32%) trainees were included in the intervention groups (84 in group 1 in 2014 and 255 in group 2 in 2016). In group 1, 3 years after the initial intervention, trainees continued to report a similar incidence of mentorship relationships (89% [41 of 46] in 2014 and 95% [42 of 44] in 2016), which suggested that the intervention effect was sustained ($\chi^2 = 1.25$; *df* = 1; *P* = .26; FIGURE).

In group 2, the mentorship strategies were associated with a significantly higher number of mentor relationships postintervention (88%, 149 of 170) compared to preintervention (66% [71 of 108]; $\chi^2 = 19.196$; *df* = 1; *P* = .00001; FIGURE). Preintervention, group 2 had a significantly lower number of mentored trainees compared to the comparison group (66% compared to 83% [306 of 367]; $\chi^2 = 15.853$; *df* = 1; *P* = .00007). Postintervention, the number of mentor relationships in group 2 significantly exceeded the comparison group (88% compared to 80% [372 of 466]; $\chi^2 = 5.141$; *df* = 1; *P* = .023). The number of mentor relationships reported in the comparison group did not change significantly between 2014 and 2016 ($\chi^2 = 1.71$; *df* = 1; *P* > .19).

Regarding mentor usefulness, between 2014 and 2016, group 1 demonstrated significant increases in mentorship usefulness in 4 of 6 categories: post-training career planning ($t = 2.554$, $P = .012$), networking ($t = 3.046$, $P = .003$), sponsorship and advocacy ($t = 2.991$, $P = .004$), and research productivity ($t = 2.209$, $P = .029$). A table showing average ratings of mentor usefulness is provided as online supplemental material. In group 2, there were significant increases in mentorship usefulness in 2 of 6 aspects: clinical skill advancement ($t = 2.025$, $P = .044$) and posttraining career planning ($t = 2.416$, $P = .016$). There were no significant changes in mentor usefulness reported in the comparison group.

Discussion

This study of a cross-discipline GME mentoring program in 16 residency and fellowship programs over 3 years demonstrated sustained increases in the number of reported mentor relationships and reported mentor usefulness. The program's framework included voluntary faculty participation, active mentee choice in the pairing, mentee role understanding, facilitated mentorship meetings, and deliberate relationship reviews.^{13,15,16}

Mentorship programs for individual training programs have shared similar foundations, including adequate training of mentors, protected mentorship time, and structured expectations to encourage accountability. Common limitations of these individual training models include absence of comparison groups, insufficient survey metrics, and lack of measures of long-term sustainability.^{13,16–20} Given its institutional role, the GME department is positioned to stimulate interest in mentorship throughout all training programs. By utilizing the preexisting GME organizational structure, such as the chief resident council and program director committee, the GME department can coach programs into developing effective mentorship models.

The study's results may be subject to recall bias, which is inherent in self-reported surveys, and survey respondents may have interpreted questions differently than intended given the survey's lack of validity evidence. Selection bias may have also been present given that the response rate ranged from 43% to 57%. There is uncertainty as to how many of the recommended intervention components were adopted by programs and which components resulted in improvements. Given the survey's anonymity, we were unable to determine differential benefits from trainee subgroups.

Future research will examine transferability to other institutions, impact on subgroups of trainees, and quantifiable outcomes such as publications and career paths.

Conclusion

This study of a GME initiative to enhance mentoring across specialties in training programs found sustained increases in the number of mentor relationships and mentor usefulness with a relatively small amount of physician educator funding.

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