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Impact of a Mentorship Program on Medical Student Burnout

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ABSTRACT

Background: Burnout can have negative consequences for providers' health and patient care. Mentorship has positive effects including stress mitigation. We sought to evaluate the impact of a mentorship program on burnout in fourth-year medical students during their 4-week emergency medicine subinternship.

Methods: This was a prospective, quasi-experimental, mixed-methods study at two institutions. We assessed burnout using the Maslach Burnout Inventory, comprising three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). We compared changes in burnout scores before and after implementation of a resident–student mentorship program. We compared categorical variables using risk ratios and continuous variables using Wilcoxon rank-sum test. To account for potential confounders, we performed multivariable analysis. Students and mentors completed an evaluative survey. We reported descriptive statistics and performed thematic qualitative analysis on free-response data.

Results: A total of 135 students (intervention = 51; control = 84) and 59 mentors participated. Intervention students demonstrated decreased EE and DP and increased PA scores, medians of –2 (–4 to 4), –1 (–3 to 2), and 1 (–1 to 4), respectively, compared to controls, median difference of 0 for all subscales. After adjusting for potential confounders, there was no significant difference in EE (mean difference = –0.2 [–0.5 to 0.2], p = 0.4) or DP scores (mean difference = –0.2 [–1.8 to 1.5], p = 0.9). There was a significant difference in PA scores (mean difference = 2.2 [0.1 to 4.3], p = 0.04). Most students felt the program positively impacted their rotation (39/48) and decreased stress (28/48). Students felt that the program provided career guidance and positively impacted their personal and professional development. The majority (34/37) of mentors enjoyed participating. Qualitative analysis revealed five major themes: relationship building, different perspective, knowledge sharing, personal fulfillment, and self-reflection.

Conclusion: We found an increased sense of personal accomplishment after implementation of a mentorship program. Both mentors and mentees viewed the program positively and perceived multiple benefits.

Burnout, broadly defined as a "state of mental and physical exhaustion related to work or caregiving activities," is an important problem affecting practicing physicians and medical trainees alike.[1–8] Burnout can be detrimental to provider physical and mental health, job satisfaction, physician productivity, and patient care.[3,9–13] Because of the great reach of this problem, there has been a call by both individuals and governing bodies to make efforts to mitigate burnout, provide education on well-being to trainees, and treat self-care as an important component of professionalism.[14–16]

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Several groups have undertaken efforts to mitigate burnout and provide the necessary tools to trainees to both recognize and treat burnout and also promote resiliency (the ability to recover from adversity) with mixed results.[17–24] These attempts have included: 1) changes in the learning environment, such as alteration of grading systems or duty hours; 2) efforts to build a sense of community, such as shared experience sessions, Balint groups, or training in communication skills; 3) instruction on the practice of positive cognitive processes such as narrative medicine, reflection, or journaling; 4) courses to assist in managing stress, such as relaxation or psychotherapeutic technique; and 5) efforts to promote resiliency such as mindfulness, meditation, exercise, and self-compassion.[17–24] Despite these efforts, best practices to mitigate the complex issue of burnout in medical trainees have yet to be established.

Prior literature has shown many positive effects of mentorship for both the mentor and the mentee.[25–29] As mentorship provides both psychosocial and career support, it has the potential to decrease burnout.[30] Additionally, professional development has been identified as a strategy for resilience in medicine.[31] Limited data have shown a positive impact of mentorship on burnout and stress in both practicing physicians and medical students.[32,33] It is currently unknown if a structured resident–student mentorship program can decrease burnout in medical students. The objective of this study was to evaluate the impact of such a mentorship program on burnout in fourth-year medical students during their emergency medicine (EM) subinternship.

METHODS

Study Setting and Participants

This study took place at two academic institutions, Harbor-UCLA Medical Center and Mount Sinai Hospital. Study participants were fourth-year (senior) medical students enrolled in the 4-week EM subinternship at the participating sites. A subinternship is a rotation in a specialized area of medicine offered during the fourth year of medical school. A mentor was offered to all subinterns, including those from the home institution as well as external rotating students. Subinterns were allowed to opt out of the mentorship program. Subinterns were informed that participation in the program would not impact their evaluations. Senior EM residents (PGY-3 or PGY-4) were notified of the program and invited to serve as mentors. Resident mentors were provided with a standardized 1-hour training session, which included expectations of the program and tips for successful mentorship. Subinterns and resident mentors were not compensated for their participation. Data were collected between February 2017 and November 2017. This study was approved by the institutional review boards of the David Geffen School of Medicine at UCLA and the Icahn School of Medicine at Mount Sinai.

Study Design

This was a prospective, quasi-experimental, mixed-methods study. Burnout was assessed in fourth-year medical students at the beginning and end of their EM subinternship using the Maslach Burnout Inventory (MBI) Human Services Survey for Medical Professionals, which consists of three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA).[34] The MBI has been used extensively to evaluate burnout in practicing physicians, nurses, residents, and medical students.[19,35] Participants completed a basic demographic questionnaire prior to participation. Changes in burnout scores were assessed prior to (control group) and after the implementation of a big sib/little sib mentorship program (intervention group). The big sib/little sib mentorship program paired senior resident mentors with student mentees in a 1:1 fashion. Because students who opted out did not participate in the mentorship program, they were analyzed as part of the control group. Mentors were purposefully paired with student mentees by the study team based on similar characteristics, such as common interests, medical school, or home town. Minimum requirements of the mentor were to meet in person with their mentee at the beginning and end of the rotation, check in with them by phone or e-mail in the middle of the rotation, and be available by e-mail during the rotation. Mentors were encouraged, however, to meet more frequently as indicated to meet the needs of their mentees. Both mentors and mentees completed an evaluative survey regarding their experience with the program at the end of the rotation which consisted of free-response and Likert-scale items. Study team members with expertise in mentorship, medical education leadership, and questionnaire design developed all surveys, according to established guidelines for survey research, and each of the surveys was piloted on a small group of representative

subjects.[36] The instruments were revised for clarity and readability. The final version of all surveys are available in Data Supplement S1 (available as supporting information in the online version of this paper, which is available at http://onlinelibrary.wiley.com/doi/10.1002/aet2.10354/full).

Data Analysis

We performed a sample size calculation and determined that we would achieve >90% power to detect a 5-point difference in change in pre-post burnout scores if we had 60 subjects in the control cohort and seven in the intervention cohort. We calculated and reported descriptive statistics. Risk ratios with 95% confidence intervals (CIs) were used to compare categorical predictor variables. Continuous variables were compared using the Wilcoxon rank-sum test. Multivariable analysis using generalized estimating equations was performed to account for potential confounders identified a priori, including institution, correlations of outcomes within institution (students and mentors at one institution are likely to be similar to one another), number of EM subinternships completed, intended specialty of EM, away rotation, and previously established mentor. We analyzed free-response survey data using a thematic approach. Two analysts, JJ and ST, independently reviewed the data, line by line, to identify recurring concepts and assign codes, which were then further refined into themes using the constant comparative method.[37] After independent review, the two researchers met to establish a final coding scheme that was applied to all data. Overall inter-rater agreement was 86%. We resolved discrepancies by in-depth discussion and negotiated consensus.

RESULTS

A total of 135 subinterns participated in the study, 84 in the control group and 51 in the intervention group. Fifty-nine mentors participated in the program. Demographic data of student participants are displayed in Table 1. Forty-eight (94.1%) students in the intervention completed the evaluative survey of the program. Thirty-seven (62.7%) mentors completed the evaluative survey.

Students in the intervention group demonstrated decreased scores on both the EE and DP subscales and increased PA scores with medians of –2 (–4 to 4), –1 (–3 to 2), and 1 (–1 to 4), respectively, compared to control students who did not show any change with a median difference of 0 for all three subscales. This difference between intervention and control groups was not statistically significant (EE $p = 0.2$, DP $p = 0.5$, PA $p = 0.06$). After potential confounders were adjusted for, again there was no significant difference in EE (mean difference = –0.2 [–0.5 to 0.2], $p = 0.4$) or DP scores (mean difference = –0.2 [–1.8 to 1.5], $p = 0.9$) between groups. There was a significant difference in PA scores (mean difference = 2.2 [0.1 to 4.3], $p = 0.04$). Significant independent predictors of change in PA score included number of EM subinternships ($p = 0.01$) and away rotations ($p < 0.0001$).

Results of the evaluative survey showed that student participants generally viewed the program positively (Table 2). The majority of participants felt that the program positively impacted their experience in the subinternship and helped decrease stress with 39 of 48 (81.3%) and 28 of 48 (58.3%) rating these

Table 1
Demographic Data of Participants

	Intervention (n = 51)*	No Intervention (n = 84)*	Risk Ratios, 95% CI, P-value Difference
Site 1	21 (41.2)	55 (65.5)	0.6, 0.4–0.8, p = 0.006
Male sex	32 (62.8)	49 (58.3)	1.1, 0.7–1.7, p = 0.6
Intended specialty of EM	47 (92.2)	52 (61.9)	4.9, 1.8–12.9, p < 0.0001
Away rotation	40 (78.4)	32 (38.1)	2.9, 1.7–5.0, p < 0.0001
Has a mentor	29 (56.9)	58 (69.1)	0.7, 0.5–1.1, p = 0.2
Number subinternship			
Median	3, 2–3	2, 1–2	p < 0.0001
Mean	2.7, 2.4–3.0	2.0, 1.8–2.2	
Month of rotation			
Median	9, 9–10	7, 6–8	p < 0.0001
Mean	9.3, 9.1–9.6	7.1, 6.7–7.5	

*Data are reported as n (%).

Table 2
Results of Student Mentee Evaluative Survey

Statement	1 = Strongly Disagree	2	3 = Neutral	4	5 = Strongly Agree	Total
The big sib program positively impacted my experience in the EM subinternship.	1 (2.1)	0 (0)	8 (16.7)	16 (33.3)	23 (47.9)	48
The BIG SIB program helped decrease my stress during the EM subinternship.	1 (2.1)	4 (8.3)	15 (31.3)	16 (33.3)	12 (25)	48
The big sib program provided me with useful career guidance.	1 (2.1)	4 (8.3)	8 (16.7)	13 (27.1)	22 (45.8)	48
The big sib program positively contributed to my personal development.	1 (2.1)	1 (2.1)	18 (37.5)	15 (31.3)	13 (27.1)	48
The big sib program positively contributed to my professional development.	1 (2.1)	1 (2.1)	12 (25)	21 (43.8)	13 (27.1)	48
My big sib was easily accessible when I needed them.	1 (2.1)	0 (0)	4 (8.3)	8 (16.7)	35 (72.9)	48
My big sib was an active listener in our discussions.	1 (2.2)	0 (0)	4 (8.7)	6 (13)	35 (76.1)	46
My big sib was emotionally supportive.	1 (2.1)	0 (0)	8 (16.7)	8 (16.7)	31 (64.6)	48
My big sib was able to knowledgably answer my questions.	1 (2.2)	0 (0)	3 (6.5)	4 (8.7)	38 (82.6)	46
I feel confident that what I discussed with my big sib was kept confidential.	1 (2.2)	0 (0)	7 (15.2)	1 (2.2)	37 (80.4)	46

Data are reported as *n* (%).

Table 3
Results of Qualitative Analysis of Mentee Survey

Question	Major Themes	Exemplar Quotes
How did the big sib program positively impact your subinternship?	Emotional support Guidance/advice	"I felt like I had an advocate, advisor, and ambassador from day one who was genuinely interested in my well-being and success." "Provided a support system at a new program." "Helped me set goals for my sub-I. Gave me someone to talk to in case I had questions about my rotation." "Gave me career and application info."
What is one thing you would like to see changed for the program next year?	No change Timing Communal event	"No changes really. Please keep program around!" "Potentially try to start prior to arrival." "Formal gathering of all big/little sibs"
Why were you unable to meet with your mentor?	Lack of perceived benefit Time limitations Communication issues	"I'm not going into EM, so a little less applicable for me." "Mentor time limitations, my time limitations." "Mentor has not reached out yet for end of rotation meeting."

statements as a "4" or "5" on a 5-point scale (5 = strongly agree), respectively. The majority of students felt that their big sib demonstrated qualities of good mentors with 35 of 48 (72.9%), 35 of 46 (76.1%), 31 of 48 (64.6%), and 38 of 46 (82.6%) of responding students "strongly agreeing" that their mentors were easily accessible, active listeners, emotionally supportive, and able to answer their questions knowledgeably, respectively. Students also felt that the program provided useful career guidance and positively contributed to their personal and professional development (Table 2). Results of qualitative analysis of free-response data from the mentee survey are displayed in Table 3. Regarding positive impact of the program, two major themes emerged: emotional support and guidance/advice. Major themes for improvement included no change, timing, and a social event. Twenty-nine 46 (63%) students reported meeting with their mentor at both the beginning and end of the rotation.

Table 4
Results of Mentor Evaluative Survey

Statement	1 = Strongly Disagree	2	3 = Neutral	4	5 = Strongly Agree	Total
I enjoyed participating in the big sib program.	0 (0)	0 (0)	3 (8.1)	18 (48.6)	16 (43.2)	37
Participating in the big sib mentorship program positively contributed to my own professional development.	3 (8.1)	0 (0)	11 (29.7)	9 (24.3)	14 (37.8)	37
Participating in this program has increased my confidence in my ability to mentor others.	3 (8.1)	0 (0)	7 (18.9)	18 (48.6)	9 (24.3)	37
Participation in this program has rejuvenated my interest in EM.	3 (8.3)	2 (5.6)	13 (36.1)	14 (38.9)	4 (11.1)	36

Data are reported as *n* (%).

Table 5
Results of Qualitative Analysis of Mentor Survey

Question	Major Themes	Exemplar Quotes
Please list 3 positive things you gained as a mentor from participating in the big sib program:	Relationship building Ability to see a difference perspective Knowledge sharing Personal fulfillment Self-reflection	"Building a relationship with a mentee." "Considering how others view aspects of the programs." "Being able to share my knowledge and experience." "Fulfillment in being able to help out other." "Allowed me to think of my experience as a resident and reflect on my progress, allowed me to reflect on the program." "It made me realize how much I've learned."
Please suggest one item for improvement of the program:	No change Communication	"Nothing." "Option to do a Skype session for the last session if yours and your mentees schedule does not work out."
Please list any additional training materials and/or experiences that would better prepare you for participation in this program:	No additional materials needed Rotation logistics	"None." "Info about their exam—they have a lot of questions."

Results of the mentor survey are displayed in Table 4. The majority (34/37; 91.9%) of mentors enjoyed participating in the program and 23 of 37 (62.2%) felt that it positively contributed to their professional development. Participation in the program improved confidence in mentoring ability for 27 of 37 (73%) mentors. Half of the responding mentors stated that it rejuvenated their interest in EM. Qualitative analysis of free response questions from the mentor survey are displayed in Table 5. Regarding positive impact of the program for mentors, five major themes emerged: relationship building, ability to see a different perspective, satisfaction with sharing knowledge/guidance, personal fulfillment, and self-reflection. Regarding suggestions for improvement, two major themes emerged: no change and communication.

DISCUSSION

After implementation of a big sib/little sib mentorship program, this study found a significant difference in PA scores and a nonsignificant trend toward decreased EE and DP. This general positive impact is consistent with prior limited data.[32,33] Given the myriad demonstrated benefits of mentorship, many of which relate to burnout and wellness, we were surprised to not have found a greater effect in this study.[25–28,30] It is possible that participants found difficulty establishing and maintaining the mentorship relationship, as has been identified as a barrier.[32] In fact, in our study, 37% of mentor–mentee pairs did not meet the minimum required times. Additionally, the duration of a subinternship is a relatively short amount of time and in this study timing was identified as an opportunity for improvement. A longer mentorship program may have yielded different results. Despite performing a sample size calculation, it is also possible that this study was underpowered to detect smaller but potentially meaningful differences.

Both mentor and mentee participants in this study viewed the program highly positively. This may have implications for resident and student satisfaction as well as additional benefits apart from mitigating burnout. There are additional implications for recruitment as rotating subinterns are often also applicants for residency, and mentorship has been suggested to be a

potential recruitment advantage.[28] This should be considered for future research. Students felt that the program helped decrease stress and provided emotional support and guidance, which is consistent with prior literature on the value of mentorship and further supports that mentorship can be highly beneficial to trainees.[25,26,29] Additionally, most students felt that their resident mentors embodied the characteristics of good mentors, including being active listeners, supportive, accessible, and knowledgeable.[27,38,39] This is likely a reflection of the mentor selection and training process of the program.

Mentors in this study also perceived many benefits consistent with prior literature, such as positive impact on professional development, relationship building, personal fulfilment, knowledge sharing, and self-reflection.[28] After self-reflection, residents often had a stronger perception of their success, and this has also been shown to be a positive outcome of being a mentor.[28] This promotion of self-reflection is an important finding as previous literature has shown that reflection can stimulate learning, enhance readiness to apply new knowledge, improve performance, and promote professional development and is a key component of medical education.[40–42]

Prior literature has found that residents feel underprepared for a career in academics.[43] A mentorship program such as this may be a means to address this gap as the positive impact on professional development that mentors cited in this study may be particularly useful for those who plan on pursing an academic career and will likely have future mentor roles. Another benefit cited by participating mentors was the provision of different perspectives. This is important for physicians in training as it helps give them a more global view of their environment and may enhance communication and problem-solving skills. Many of the benefits of the program cited by mentors may help to decrease burnout and promote resiliency congruent with prior literature.[28] This is another area of potential research as this study did not assess burnout in mentors.

Time constraints, communication barriers, and lack of perceived benefit appear to be the most significant obstacles identified in this study which have been identified previously as barriers to effective mentoring.[27] Participants suggested improvement strategies center around communal events, timing, and communication themes. Potential means to improve a resident student mentorship program include protecting time for mentoring activities, initiating the relationship earlier to increase continuity and promote more longitudinal relationships, and making communication easier by aligning mentor–mentee schedules and utilizing alternative meeting methods, such as Skype. Additionally supporting group events outside the clinical and classroom environments may help foster relationship building, which is essential for successful mentorship. Implementing these changes may increase the value and impact of such a program.

LIMITATIONS

Since this study took place at two academic centers in the United States, the results may not be generalizable to other settings. The intervention and control groups were not equivalent. However, as we examined change in MBI scores and used participants as their own controls, we do not expect that this impacted our results greatly. Additionally, participants may be sensitized to the construct of burnout and it is possible that our results may have been influenced by a Hawthorne effect. Long-term outcomes and mentor burnout were not assessed and can be an important area of future research. While we controlled for multiple variables, there may be other confounders not accounted for in our analysis that may have influenced our results. Although the MBI has been used extensively to assess burnout in medical professionals including medical students, there are inherent limitations to this instrument including that is was not normed on training physicians and does not account for nonprofessional aspects that can influence burnout.[44] We also did not have 100% compliance with program activities in the intervention group. Although this reflects real-world implementation, it may have influenced our results. The response rate from the mentors is moderate and there may be viewpoints that were not captured in the data. This study may have not been powered to detect smaller but meaningful differences between the intervention and control groups. Despite these limitations, this study still demonstrates that implementing a resident–student mentorship program is feasible and has benefits for both students and residents.

CONCLUSIONS

This study found an increased sense of personal accomplishment after implementation of a resident–

student mentorship program. There was a nonsignificant trend toward decreased emotional exhaustion and depersonalization scores. Both mentors and mentees viewed the program positively and perceived multiple benefits. Additional research is needed to further evaluate ways to mitigate the complex issue of medical student burnout.

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Supporting Information

The following supporting information is available in the online version of this paper available at http://onlinelibrary.wiley.com/doi/10.1002/aet2.10354/full

Data Supplement S1. Survey instruments.