Faculty Mentorship Programs in Orthopaedic Surgery Departments in the United States

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Abstract

Object:
Mentorship of junior faculty has been considered an important factor in having a productive and satisfying career in various fields of academic medicine; however, there is a lack of research investigating faculty mentoring in orthopaedic surgery. The purpose of this study was to determine the number of orthopaedic surgery departments in the United States that have faculty mentorship programs.

Methods:
A multiple-choice online survey about the presence and characterization of faculty mentorship programs was sent to the 164 department chairs of ACGME-accredited orthopaedic surgery residency programs in the United States in July 2017. Survey results were collected and statistically analyzed using 1-sample χ² test, Wilcoxon rank-sum test, and Fisher exact tests.

Results:
Fifty-seven of 159 successfully contacted orthopaedic department chairs completed the survey, yielding a 36% response rate. Twenty-nine of 57 (51%) chairs reported having a faculty mentorship program, of which 62% were formalized. The most cited reason for a department not to have a faculty mentorship program was lack of time (89%).

Conclusion:
Based on these findings, approximately 50% of ACGME-accredited orthopaedic surgery departments have some form of faculty mentorship. More studies are needed to clarify the state of faculty mentorship in orthopaedics and its potential effects.
Keywords: Mentorship; Junior Faculty; Orthopaedic Surgery

Introduction

Many factors contribute to a successful career in academic medicine, including networking, work-life balance, and research productivity. Mentorship has been identified as a key contributor to successful careers, job satisfaction, productivity, and academic achievement (Pololi and Knight, 2005; Sambunjak, Straus and Marušić, 2006; Wasserstein, Quistberg and Shea, 2007; Ries et al., 2012; Kibbe et al., 2016a; Welch et al., 2017). Different individuals are responsible for shaping medical students’ careers as they transition to residency, from residency to fellowship, and from fellowship to becoming faculty. The same can be said for junior faculty as they embark on their careers. Mentorship is generally a relationship between a less experienced junior faculty mentee and a well-seasoned senior mentor in the field that can foster the mentee’s growth. Effective mentorship in the realm of academic medicine has been shown to enhance career satisfaction by affecting career direction and development, individual growth, job promotion, research publication volume, professional networking, and decreased burnout (Judy Illes et al., 2000; Pololi and Knight, 2005; Sambunjak, Straus and Marušić, 2006; Thorndyke et al., 2006a; Wasserstein, Quistberg and Shea, 2007; Feldman et al., 2009; Edmunds et al., 2016; Kibbe et al., 2016a; Phitayakorn, Petrusa and Hodin, 2016a). Conversely, lack of an advisor has been cited as a reason for inability to advance in academics and is associated with career dissatisfaction (Pololi and Knight, 2005; Feldman et al., 2009; Phitayakorn, Petrusa and Hodin, 2016a). Many previous studies assess the efficacy of a formal model of faculty mentoring on a small cohort of full-time faculty without any standardization of those programs (J Illes et al., 2000; Thorndyke et al., 2006b; Phitayakorn, Petrusa and Hodin, 2016b).

A study by Phitayakorn et al. examined the implementation of a formal mandatory faculty mentoring program within the Massachusetts General Hospital General Surgery Department (Phitayakorn, Petrusa and Hodin, 2016a). After one year of mentorship meetings and evaluations, junior faculty believed the program helped develop career plans and involvement in professional organizations. Despite their successes, the program did not improve academic productivity, work/life balance, or job satisfaction. The latter findings may have been due to the short follow-up (Phitayakorn, Petrusa and Hodin, 2016a). In 2003, the Department of Medicine at Penn State College of Medicine developed a Junior Faculty Development Program with the intent of facilitating junior faculty career development. An anonymous survey demonstrated that formal program participants were better prepared for individual career advancement than their peers (Thorndyke et al., 2006a).

Another study examined the effects of a formal faculty mentoring program in an academic radiology department (Judy Illes et al., 2000). After the needs of the mentorship program were established through open forums, senior faculty members were recruited to participate voluntarily and the committee chair established formal mentorship guidelines. Junior faculty were then invited to self-select their mentors. Participants agreed to take part in formal mentoring meetings, complete evaluations, and be followed over a 18-month period. At the conclusion of the study, junior faculty members were noted to have higher independent performance measures (i.e. research, teaching) compared to the beginning of the mentorship program. The authors also noted that in addition to the objective measures of performance improvement, 11 of the junior faculty members were promoted within the department (Judy Illes et al., 2000).

There are several barriers that prevent widespread implementation of formal mentorship programs, including time constraints, reimbursement, and institutional support (Straus, Chatur and Taylor, 2009). While a number of studies have been conducted regarding the effect of mentoring junior faculty within academic medicine, general surgery, and other fields, to our knowledge there is no such study related to orthopaedic surgery. The purpose of this study
was to determine the number of orthopaedic surgery departments in the United States that have faculty mentorship programs, the characteristics of such programs and reveal barriers for those institutions to establishing a mentorship program without a mentorship program. In this original study, there are no potential conflict of interests from any of the authors involved.

**Methods**

This study was reviewed by the Institutional Review Board (IRB) of the senior author's institution (1062468-1). It was determined that this study did not constitute human subjects research, as no individual opinions or information were being obtained; thus, IRB approval was not required.

We attempted to contact all 164 chair of ACGME-accredited orthopaedic surgery residency programs via email; however, two messages were returned as undeliverable and three programs did not have any contact information available, leaving a total of 159 chair in the study group. Contact information for the department chairs was obtained from publicly accessible resources, including program websites, or by contacting the program coordinators for those programs that did not have contact information readily available. The survey was distributed to the department chairs via email in July 2017. The survey was completed anonymously, voluntarily, and using an online survey response system such that each chair was only able to respond once (SurveyMonkey, San Mateo, CA). Follow-up emails were sent at 2 and 4 weeks to encourage more participation.

The questionnaire was composed of 9-19 questions, depending on responses regarding the presence of a mentoring program, description of the mentorship model, and any barriers to developing a mentorship program if no program was currently in place (complete survey is available as Supplemental Digital Appendix 1). Question types included yes/no, multiple choice, multiple-selection, and free text. The survey was adapted with permission from the "Department of Surgery Mentorship Program Survey" (Kibbe et al., 2016b).

**Statistical Analysis**

These results were calculated from the total number of responses received for each question. Some questions had a logic function attached (e.g. If a participant selected "yes" for question 5, a specific set of questions would be presented, which were different than if the response was "no"); therefore, not every question was available to each recipient. Data was analyzed using 1-sample χ2 test, Wilcoxon rank-sum test, and Fisher exact test. Test statistics were considered to be significant when the P value ≤ 0.05.

**Results/Analysis**

Overall, 57 of the 159 successfully contacted orthopaedic department chairs completed the survey (36% response rate). The mean number of faculty in each program was 16-20 (n = 12) and the median was >20 (n = 31). The majority of respondents were from the South Atlantic (n = 10), New England (n = 9), Mid-Atlantic (n = 8), and Midwest East-North Central (n = 8) regions (Figure 1).

**Figure 1:** Geographic Distribution of Participating Orthopaedic Department Chairs
Approximately 54% of chairs (n = 31 of 57) reported encouraging faculty members to develop mentoring relationships with orthopaedic surgeons outside of their own institution and about 56% of respondents (n = 32 of 57) reported encouraging mentoring relationships within their institution, but outside the department of orthopaedic surgery. Twenty-nine of 57 department chairs (51%) responded that they had an established junior faculty mentorship program, and 75% (n = 21 of 28) of those who did not have a mentorship program would be willing to start one. Only 28% of departments (n = 8 of 29) with established mentorship programs offered training to teach effective mentorship techniques. Thirteen of 29 programs (45%) with faculty mentoring programs either agreed or strongly agreed with the statement that their mentees were satisfied with the mentorship program (Figure 2).

**Figure 2:** The Extent Department Chairs Agreed With The Statement "Overall The Mentees Are Satisfied With The Mentorship Program"
Mentor-Mentee Pairing & Eligibility
In departments with established junior faculty mentorship programs, 18 of 29 (62%) programs had formal mentoring relationships (mentee was assigned a mentor/mentors or one person was designated as the mentor to all the mentees), while 6 of 29 (21%) mentoring relationships were considered informal (mentors were self-selected by the mentees, one free text answer yielded a response that was a mix of self-selection or assignment). Those eligible to participate in the faculty mentoring program as mentees most often included assistant professors (n = 22 of 29, 76%), instructors (i.e. chief residents, fellows, or other instructors, n = 14 of 29, 48%), and associate professors (n = 14 of 29, 48%) (Figure 3).

Figure 3: Faculty Members Eligible for the Department Mentoring Program
In 4 out of 29 (17%) mentorship programs, one point-person was designated as the mentor to all mentees, while 25 departments established mentoring relationships by other means (Figure 4).

**Figure 4: Establishment of Faculty Mentor-Mentee Relationships in Orthopaedic Surgery Departments**

In 6 out of 29 (21%) mentoring programs, there was a one-to-one relationship of mentor to mentee, while 8 departments (28%) had two mentees per mentor, and another 8 (28%) had three or more mentees per mentor.
In 11 of 29 (38%) mentoring programs, expectations for the mentoring relationship were set by either the mentee or mentor, while 8 departments (28%) did not require expectations to be established, and 6 (21%) departments set formal expectations for both the mentor and the mentee. In only 3 of 29 departments (10%), faculty mentees were required to fill out a form stating their long and short-term goals after establishing the mentor-mentee relationship. Only one of the 29 chairs (4%) with an established faculty mentorship program required the mentors or mentees to sign a contract regarding the duties and expectations of the mentoring relationship. Twelve of 29 (41%) of programs held mentoring meetings on an as needed basis, while the others who responded had regularly scheduled intervals (41%, n=12 of 29).

Twenty of 29 departments (70%) with an established mentorship program indicated that they did not require mentees to complete mentor evaluations, while 4 departments (14%) completed evaluations on a set time interval. Twenty-two of 29 orthopaedic departments (76%) with an established faculty mentorship program had no formal exit strategy in place for failed faculty mentor-mentee relationships.

**Departments Without Mentorship Programs**

For departments without an informal or formal faculty mentoring program, the most frequently reported barriers to implementation of such a program were time (n = 25 of 28, 86%), compensation (n =11 of 28, 38%), and funding (n = 11 of 28, 38%) (Figure 5).

**Figure 5: Barriers to Implementing Faculty Mentorship Program**

|               | Percentage |
|---------------|------------|
| Funding       | 40.00%     |
| Time          | 50.00%     |
| Compensation  | 40.00%     |
| Awareness of the benefits and efficacy of faculty mentorship programs | 30.00% |
| Perceived effectiveness or value | 30.00% |

After indicating to the department chairs that several studies have demonstrated that effective mentorship in academic medicine enhances junior faculty career satisfaction by improving career direction and development, individual growth, research publication volume, and professional networking, 21 of 28 (75%) reported that they would consider implementing a faculty mentorship program.
Comparison of Departments With and Without Mentorship Programs

Characteristics of orthopaedic surgery departments with an established junior faculty mentoring program were compared to those without such a program. On average, departments with mentoring programs had more faculty than departments without mentoring programs (p = 0.024). Departments with mentoring programs, however, did not have significantly more annual academic pursuits (described as publications, podium, poster presentations, and the like) when compared to those departments that did not have a faculty mentoring program (p = 0.14). Departments with an established mentoring program encouraged faculty to seek mentorship from others outside the field of orthopaedic surgery within the institution significantly more than those who did not have a mentoring program (p < 0.01). There was no difference between departments with and without mentoring programs when it came to encouraging faculty to establish a mentoring relationship with orthopaedic surgeons at outside institutions (p = 0.28).

Comparison of Formal and Informal Mentorship Programs

Mentorship programs were categorized as formal or informal based upon how the mentorship relationship was created; formal mentoring consisted of assigned mentors or a designated mentor for all mentees, whereas informal relationships were self-selected by the mentee. The total number of formal mentoring groups was 18 of 29 (62%) and informal was 7 of 29 (24%). The type of mentoring program did not affect whether or not a program offered mentorship training (p = 0.88). There was no significant difference between formal or informal mentoring relationships regarding the establishment of formal goals by the mentor-mentee (p = 0.33) or requiring the mentor and mentee to sign a contract with regards to duties in the mentoring relationship (p = 0.28). Formally established mentoring programs were not significantly more likely to have established goals (p = 0.063).

With regard to the establishment of expectations for the mentoring relationship, there was no significant difference between the formal and informal group (p = 0.16). There was also no difference between informal or formal mentoring groups in providing mentees with an exit strategy for failed mentoring relationships (p = 1), in chairs’ perceived satisfaction with the mentoring program (p = 0.31), number of mentees per mentor (p = 0.22), or frequency of meetings (p = 0.23). Lastly, there was no significant difference between formal or informal mentoring styles with the number of academic pursuits completed per year (p = 0.61).

Discussion

This study demonstrates that about half of the ACGME accredited orthopaedic surgery departments who responded have an established junior faculty mentoring program, approximately 60% of which are formally established. Less than one-third of the departments with established mentoring programs offer mentors training on effective mentoring techniques. Interestingly, departments with a mentoring program did not have significantly more annual academic pursuits (e.g. podiums, publications). Departments that had mentoring programs tended to have a larger faculty than programs that did not. When comparing informally and formally created mentorship relationships, there was no difference between the two groups with regard to setting expectations and formal goals, perceived satisfaction rates, or presence of an exit strategy for failed mentoring relationships.

Previous studies related to faculty mentoring in emergency medicine and general surgery have demonstrated a mixture of formal and informal programs (Kibbe et al., 2016a; Welch et al., 2017). The proportion of orthopaedic departments with mentorship programs was less than that of emergency medicine, but on par with general surgery. The orthopaedic surgery departments tended to have more formal mentorship programs, while emergency medicine was split more evenly, slightly favoring the formal mentoring style, and general surgery favored informal mentoring (Kibbe et al., 2016a; Welch et al., 2017). Although this study failed to demonstrate a higher number of academic pursuits per year in departments with mentoring programs, this may be attributable to the low power of the study. A prior study by Bland et al. (Bland et al., 2005) evaluated research output within academic medicine and found that
departments with mentoring programs had higher research productivity compared to those programs that did not. We also found that departments with faculty mentoring had significantly more faculty that those without mentoring programs, which may imply that faculty mentoring programs lead to less faculty attrition (Ries et al., 2012) or that larger departments are more capable of maintaining a successful faculty mentoring program.

About half of the orthopaedic surgery department respondents reported that their institution did not have any type of mentorship program. The most commonly cited reason for not having such a program was time, followed by funding and compensation. While there are numerous demands placed on a physician’s time within academic medicine and surgical fields, this problem could potentially be resolved if institutions understood the benefits of a faculty mentoring program. Faculty mentoring has been shown to increase job satisfaction, faculty retention, and academic productivity (Bland et al., 2005; Pololi and Knight, 2005; Sambunjak, Straus and Marušić, 2006; Wasserstein, Quistberg and Shea, 2007; Feldman et al., 2009; Ries et al., 2012; Kibbe et al., 2016a; Welch et al., 2017). All of the aforementioned factors have the potential to produce more revenue for an academic institution. Our study also found that most departments without a faculty mentoring program would be more willing to start such a program after being informed that effective mentorship in academic medicine has been shown to enhance junior faculty career satisfaction in a number of ways. Education about the benefits of faculty mentoring programs may be the first step toward making such programs more prevalent in orthopaedic surgery.

Though it is difficult to ascertain the long-term effects of mentoring junior faculty without prospective longitudinal studies, it would be reasonable to use academic publications per year as a quantifiable marker of academic success (Bland et al., 2005; Sambunjak, Straus and Marušić, 2006). On the other hand, lack of mentorship is correlated with failure to complete academic duties (Rivera, Levine and Wright, 2005; Sambunjak, Straus and Marušić, 2006; Ries et al., 2012). Another marker of academic success is academic promotion within an institution, which has also been associated with presence of a formal mentoring program in one study (Morrison et al., 2014). Not only is mentorship important for current junior faculty, but early involvement in junior faculty mentoring can create a culture of mentorship that can be carried forward for future generations.

This study has several limitations. The low response rate may make the results less generalizable to other academic orthopaedic surgery programs. Additionally, some of the respondents did not answer every question in the survey, further decreasing the overall power of the study. The nature of the survey also leads to some potential biases in that self-reporting bias and self-selecting bias may make departments with faculty mentoring programs more inclined to complete the survey, which may have inflated their numerical responses accordingly. The data also cannot be verified because of the anonymity in the survey. Furthermore, the survey represents one point in time rather than longitudinal trends of mentoring. Another limitation is assuming that "academic pursuits" is the sole measurement of productivity in orthopaedic surgery departments. Despite these limitations, we believe that this survey provides valid insight into the current state of faculty mentoring in orthopaedic surgery departments in the United States.

**Conclusion**

This study provides insight into the current prevalence and diversity of faculty mentoring programs within ACGME-accredited orthopaedic surgery departments. Based on these findings, about half of orthopaedic surgery departments have some form of faculty mentorship, the majority of which is formally established. Increasing the amount of faculty mentorship participation may create a culture of mentorship for future generations of academic orthopaedic surgeons, increase academic publication rates, augment career promotion, and decrease faculty attrition. Future studies exploring different types of faculty mentoring on a prospective basis may lead to further insights into the benefits of such programs.
Take Home Messages

- Faculty mentoring has been shown to be beneficial to medical professionals’ careers
- Evaluated junior faculty mentoring in orthopaedic surgery through a survey
- About half of responding orthopaedic surgery chairs had a faculty mentoring program
- Departments with mentoring programs had more faculty than those without one
- Future studies needed to evaluate the status of mentoring in orthopaedic surgery

Notes On Contributors

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Creator/owner of the following images: Figures 1-5, Source: the author, Patricia R. Melvin MD.

Bibliography/References

Bland, C. J., Center, B. A., Finstad, D. A., Risbey, K. R., et al. (2005) ‘A Theoretical, Practical, Predictive Model of Faculty and Department Research Productivity’, *Academic Medicine*, 80(3), pp. 225–237. https://doi.org/10.1097/00001888-200503000-00006.

Edmunds, L. D., Ovseiko, P. V., Shepperd, S., Greenhalgh, T., et al. (2016) ‘Why do women choose or reject careers in academic medicine? A narrative review of empirical evidence’, *The Lancet. Elsevier Ltd*, 388(10062), pp. 2948–2958. https://doi.org/10.1016/S0140-6736(15)01091-0.

Feldman, M. D., Huang, L., Guglielmo, B. J., Jordan, R., et al. (2009) ‘Training the Next Generation of Research Mentors: The University of California, San Francisco, Clinical & Translational Science Institute Mentor Development Program’, *Clinical and Translational Science*, 2(3), pp. 216–221. https://doi.org/10.1111/j.1752-8062.2009.00120.x.

Illes, J, Glover, G. H., Wexler, L., Leung, A. N. C., et al. (2000) ‘A model for faculty mentoring in academic radiology.’, *Academic Radiology*, 7(9), pp. 717–24;725-6. https://doi.org/10.1016/S1076-6332(00)80529-2.
Illes, Judy, Glover, G. H., Wexler, L., Leung, A. N. C., et al. (2000) ‘A model for faculty mentoring in academic radiology’, Academic Radiology, 7(9), pp. 717–724. https://doi.org/10.1016/S1076-6332(00)80529-2.

Kibbe, M. R., Pellegrini, C. A., Townsend, C. M., Helenowski, I. B., et al. (2016a) ‘Characterization of Mentorship Programs in Departments of Surgery in the United States’, JAMA Surgery, 151(10), p. 900. https://doi.org/10.1001/jamasurg.2016.1670.

Kibbe, M. R., Pellegrini, C. A., Townsend, C. M., Helenowski, I. B., et al. (2016b) ‘Characterization of Mentorship Programs in Departments of Surgery in the United States’, JAMA Surgery, 151(10), p. 900. https://doi.org/10.1001/jamasurg.2016.1670.

Morrison, L. J., Lorenz, E., Bandiera, G., Liles, W. C., et al. (2014) ‘Impact of a formal mentoring program on academic promotion of Department of Medicine faculty: A comparative study’, Medical Teacher, 36(7), pp. 608–614. https://doi.org/10.3109/0142159X.2014.899683.

Phitayakorn, R., Petrusa, E. and Hodin, R. A. (2016a) ‘Development and initial results of a mandatory department of surgery faculty mentoring pilot program’, Journal of Surgical Research. Elsevier Inc, 205(1), pp. 234–237. https://doi.org/10.1016/j.jss.2016.06.048.

Phitayakorn, R., Petrusa, E. and Hodin, R. A. (2016b) ‘Development and initial results of a mandatory department of surgery faculty mentoring pilot program’, Journal of Surgical Research. Elsevier Inc, 205(1), pp. 234–237. https://doi.org/10.1016/j.jss.2016.06.048.

Pololi, L. and Knight, S. (2005) ‘Mentoring faculty in academic medicine’, Journal of General Internal Medicine, 20(9), pp. 866–870. https://doi.org/10.1111/j.1525-1497.2005.05007.x.

Ries, A., Wingard, D., Gamst, A., Larsen, C., et al. (2012) ‘Measuring Faculty Retention and Success in Academic Medicine’, Academic Medicine, 87(8), pp. 1046–1051. https://doi.org/10.1097/ACM.0b013e31825d0d31.

Rivera, J. A., Levine, R. B. and Wright, S. M. (2005) ‘Brief report: Completing a scholarly project during residency training’, Journal of General Internal Medicine, 20(4), pp. 366–369. https://doi.org/10.1111/j.1525-1497.2005.04157.x.

Rohde, R. S., Wolf, J. M. and Adams, J. E. (2016) ‘Where Are the Women in Orthopaedic Surgery?’, Clinical Orthopaedics and Related Research. Springer US, 474(9), pp. 1950–1956. https://doi.org/10.1007/s11999-016-4827-7.

Sambunjak, D., Straus, S. E. and Marušić, A. (2006) ‘Mentoring in Academic Medicine’, JAMA, 296(9), p. 1103. https://doi.org/10.1001/jama.296.9.1103.

Straus, S. E., Chatur, F. and Taylor, M. (2009) ‘Issues in the mentor-mentee relationship in academic medicine: a qualitative study.’, Academic Medicine: Journal of the Association of American Medical Colleges, 84(1), pp. 135–139. https://doi.org/10.1097/ACM.0b013e31819301ab.

Thorndyke, L. E., Gusic, M. E., George, J. H., Quillen, D. A., et al. (2006a) ‘Empowering Junior Faculty: Penn State’s Faculty Development and Mentoring Program’, Academic Medicine, 81(7), pp. 668–673. https://doi.org/10.1097/01.ACM.0000232424.88922.df.
Thorndyke, L. E., Gusic, M. E., George, J. H., Quillen, D. A., et al. (2006b) ‘Empowering Junior Faculty: Penn State’s Faculty Development and Mentoring Program’, Academic Medicine, 81(7), pp. 668–673. https://doi.org/10.1097/01.ACM.0000232424.88922.df.

Wasserstein, A. G., Quistberg, D. A. and Shea, J. A. (2007) ‘Mentoring at the University of Pennsylvania: Results of a Faculty Survey’, Journal of General Internal Medicine, 22(2), pp. 210–214. https://doi.org/10.1007/s11606-006-0051-x.

Welch, J., Sawtelle, S., Cheng, D., Perkins, T., et al. (2017) ‘Faculty Mentoring Practices in Academic Emergency Medicine’, Academic Emergency Medicine. Edited by D. B. Diercks, 24(3), pp. 362–370. https://doi.org/10.1111/acem.13136.

Appendices

Supplemental Digital: Appendix 1

Department of Orthopaedic Surgery Mentorship Program Survey

1. In what geographic location is your residency program located?
   a. Northeast – New England (CT, ME, MA, NH, RI, VT)
   b. Northeast – Middle Atlantic (NJ, NY, PA)
   c. Midwest – East North Central (IN, IL, MI, OH, WI)
   d. Midwest – West North Central (IA, KS, MN, MO, NE, ND, SD)
   e. South – South Atlantic (DE, DC, FL, GA, MS, NC, SC, VA, WV)
   f. South – East South Central (AL, KY, MS, TN)
   g. South – West South Central (AR, LA, OK, TX)
   h. West – Mountain (AZ, CO, ID, NM, MT, UT, NV, WY)
   i. West – Pacific (AK, CA, HI, OR, WA)

2. How many faculty members are in your department (Kibbe et al., 2016)?
   a. 0-5
   b. 6-10
   c. 11-15
   d. 16-20
   e. >20

3. Do you encourage your faculty members to develop mentoring relationships with orthopaedic surgeons outside of your institution?
   a. Yes
   b. No

4. Is there an established (formal or informal) faculty mentorship program in your department (Kibbe et al., 2016)?
   a. Yes
   b. No

5. [If "No" to 4] Would your department be willing to start a faculty mentorship program?
   a. Yes
6. [If "No" to 4] What are some of the barriers to having or starting a faculty mentorship program? [Please select all that apply.]
   a. Funding
   b. Time
   c. Compensation
   d. Awareness of the benefits and efficacy
   e. Perceived effectiveness or value

7. [If "No" to 4] Several studies have found that effective mentorship in academic medicine has been shown to enhance career satisfaction of junior faculty by affecting career direction and development, individual growth, research publication volume, and professional networking; does knowing this information influence your decision of whether or not to implement a faculty mentorship program at your institution?
   a. Yes, more likely to implement a faculty mentorship program
   b. No, not more likely to implement a faculty mentorship program

8. [If "Yes" to 4] Are the faculty mentors offered formal training for effective mentorship techniques (Kibbe et al., 2016)?
   a. Yes
   b. No

9. [If "Yes" to 4] Who is provided with a mentor as part of your formal or informal mentoring program (Kibbe et al., 2016)? [Please select all that apply]
   a. Instructors (i.e., chief residents, fellows, or others who qualify as Instructors)
   b. Assistant Professor
   c. Associate Professor
   d. Professor
   e. Research Assistant Professor
   f. Research Associate Professor

10. [If "Yes" to 4] How was the mentor/mentee relationship created?
    a. Assigned a mentor
    b. Self-selection
    c. One person is designated as the mentor to all mentees
    d. Other [please specify]

11. [If "Yes" to 4] How many faculty members are paired with one faculty mentor (Kibbe et al., 2016)?
    a. 1
    b. 2
    c. 3
    d. >3
    e. N/A faculty are not assigned to faculty members

12. [If "Yes" to 4] Do faculty mentors/mentees sign a contract about his/her duties and expectations as a mentor/mentee (Kibbe et al., 2016)?
    a. Yes
    b. No

13. [If "Yes" to 4] How were the expectations of the mentorship program established?
a. Formal guidelines provided from the department to both the mentor and mentee  
b. Mentee established expectations for him/herself  
c. Mentees and mentors are not required to set expectations

14. [If "Formal guidelines" or "Mentee established expectations" to 12] Do faculty mentees fill out a form stating their short-term and long-term goals upon establishing the mentor-mentee relationship (Kibbe et al., 2016)?  
   a. Yes  
   b. No

15. [If "Yes" to 4] How frequently do the faculty mentors meet with their mentees (Kibbe et al., 2016)?  
   a. As needed  
   b. Every month  
   c. Every 3 months  
   d. Every 6 months  
   e. Once per year  
   f. Other [please specify]

16. [If "Yes" to 4] Are the faculty mentees required to fill out an evaluation form on the faculty mentor (Kibbe et al., 2016)?  
   a. No  
   b. Yes; on a set interval  
   c. Yes; the interval is decided by the mentor or mentee

17. [If "Yes" to 4] Does your department have a formal exit strategy in place for failed faculty mentor-mentee relationships (Kibbe et al., 2016)?  
   a. Yes  
   b. No

18. [If "Yes" to 4] To what degree do you agree with the following statement: overall, are the mentees satisfied with the mentorship program  
   a. Strongly Agree  
   b. Agree  
   c. Neutral  
   d. Disagree  
   e. Strongly Disagree

19. On average, how many publications does your department partake in per year?  
   a. 0-10  
   b. 10-20  
   c. 20-30  
   d. >30

20. Do you encourage your faculty members to develop mentoring relationships with other faculty at your institution who are outside of the department of orthopaedic surgery?  
   a. Yes  
   b. No
Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

This study was reviewed by the Institutional Review Board (IRB) of the senior author’s institution (Tulane University Biomedical Department: IRB 1062468-1). It was determined that this study did not constitute human subjects research, as no individual opinions or information were being obtained; thus, IRB approval was not required.

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