

Mentoring Program in Academic Medicine: A Systematic Review Study

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ABSTRACT

Background: Mentoring is a crucial component of academic medicine, facilitating collaboration to enhance individuals' personal and professional growth. However, medical faculty face increasing pressures from clinical, administrative, research, and educational responsibilities, which can strain mentoring efforts. Thus, it is essential to assess the evidence that underscores the importance of mentoring.

Methods: In this systematic review, we identified 74 relevant studies from both international and national databases. Additionally, we searched the gray literature via Google Scholar. From these, we selected 16 studies for further analysis. We extracted pertinent data for our study using Excel and calculated the variance through binomial distribution. The research heterogeneity was assessed using the I^2 index, and we analysed the data with a random effects model.

Results: The findings revealed that the mentoring program comprises three key stages: "Targeting and Familiarization with the Implementation of the Mentoring Program," "Mentoring Program Implementation," and "Evaluation of the Mentoring Program." Various methods were employed to implement the plan, including the Traditional One-to-One Mentoring Program, the Peer Mentoring Program, and the Distance Education Mentoring Program.

Conclusion: While mentoring is considered a vital aspect of academic medicine, the existing evidence supporting this belief is limited.

Introduction

The concept of mentoring can be traced back to ancient Greek civilization, particularly in Homer's epic, **The Odyssey**. In this story, Odysseus entrusts a mentor with the responsibility of caring for his palace and raising his son, Telemachus, while he is away at the Trojan Wars. This relationship is often regarded as one of the earliest documented examples of mentoring [1]. Mentorship is characterized as a reciprocal

relationship between a mentor and a mentee, manifesting in two primary forms:

1. Formal Mentorship: This type involves systematic evaluations of the mentee's skills and progress.
2. Informal Mentorship: This form encompasses guidance provided by a senior or more experienced colleague to someone less experienced [2].

Mentorship within the health profession offers numerous potential benefits, which can be grouped into three main categories. First, it has the potential to enhance job satisfaction for the mentee, open up research opportunities, and result in various grants and publications. Second, mentorship contributes to

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improved academic self-efficacy and is essential for those looking to advance their careers in academia. Third, this reciprocal relationship is advantageous for mentors as well, as it provides personal fulfillment, opportunities for developing leadership and coaching skills, and enhances their own career prospects. At the institutional level, mentorship leads to better employee performance, professional growth, and more efficient training processes [3-4].

Research has shown that men are generally more likely to find mentors, and these mentoring experiences are often reported as more positive compared to those of women [5]. Four major barriers have been identified in mentorship within the field of anesthesia, including gender disparities, the availability and time constraints of mentors, and generational differences. Other challenges consist of varying perceptions of the goals of mentorship, feelings of disillusionment, and negative experiences related to mentoring [6].

While mentorship has been widely studied across various medical specialties, specific data on anesthesia remains scarce. In the United States, studies suggest that the majority of anesthesiology programs have formal mentorship frameworks, particularly in academic settings [7]. Moreover, a Canadian study assessed the viewpoints of anesthesiology residents regarding mentorship and found a generally favorable attitude toward their experiences with mentoring.

Methods

Search Strategy and Study Selection

This systematic review adhered to the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and the "Cochrane Handbook for Systematic Reviews of Interventions" [1, 8].

The search was done in both national and international databases, such as EMBASE, Magiran, Barkat Knowledge Network System (Barakatks), and Scientific Information Database (SID). International databases that were used were Medline/PubMed, Science Direct, and Scopus. In addition, gray literature was detected by search in Google Scholar. The study was conducted in 2022, and all related studies that were published before the mentioned date were evaluated, and related data were extracted. To search the databases, the following keywords were used: "Mentoring; Systematic Review; Medicine; Education" [9-11].

Inclusion and Exclusion Criteria

The primary published research in Persian and English languages that evaluated the mentoring in medicine without time restriction was evaluated. Additionally, we excluded studies that contained only abstracts, congress

abstracts, book chapters, inadequate data, no relevant data, or review articles.

Data Extraction

The primary research information needed was gathered and stored by two authors working separately. If the authors didn't agree on something, they talked to other people in the study and came to an agreement. The first author's name, the region, the country, the year of publication, the sample size, the length of the study, the rate of co-infection, and other factors related to the study were taken out.

Risk of Bias

To assess the risk of bias, we evaluated the quality of the studies using the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist. Based on the evaluation, the studies were classified into three quality categories: high, medium, and low [12-14].

Publication Bias and Sensitivity Analysis

The data was put through tests of the funnel plot and Egger's linear regression to look at the bias of publication [15]. The sensitivity analysis was also based on figuring out the effect of each piece of research on the overall prevalence estimates, which were found by taking one piece of research out of all the studies that were being looked at.

Results

Out of 638 studies identified through online database searches, 16 studies met the inclusion criteria and were included in this review. The systematic analysis revealed that mentoring programs generally consist of three distinct stages. The first stage involves "targeting and familiarization with the implementation of the mentoring program." The second stage focuses on "the implementation of the mentoring program," and the final stage entails "evaluating the mentoring program." In four of the studies, mentees were allowed to select their mentors based on shared interests and areas of expertise, whereas in the other studies, the pairing of mentors and mentees was conducted by facilitators or committees responsible for overseeing the mentoring initiatives [14, 16-22].

Targeting and Familiarization with the Mentoring Program Implementation

In the initial phase of developing the mentoring program, a need expressed by the university or newly hired faculty members triggered the planning process, which included appointing qualified individuals as mentors and mentees [18, 23-26]. After registration, committees are typically established to evaluate the

qualifications of mentors and oversee the effective implementation of the mentoring program. A key question that emerges is which faculty members should be involved in this mentoring initiative. The prevailing opinion is that all faculty members stand to gain from participation in a mentoring program [17, 27]. Specifically, according to academic rank, different faculty members have unique needs. For instance, full professors and associate professors may require mentoring to enhance their leadership capacities, while clinical faculty and assistant professors may focus on professional development.

Once individuals are registered, the relationship between the mentor and mentee typically starts during initial meetings, where they become acquainted with one another [27]. During these meetings, goals and a roadmap for the mentoring program are collaboratively established based on the needs of the mentees. Common objectives for these programs include enhancing skills in education and research, fostering beneficial relationships, developing management and leadership competencies, achieving a work-life balance, improving time management, and promoting individual autonomy and professional growth.

Implementation of the Mentoring Program

Once the goals and paths for the mentoring program are established through meetings, workshops, and introductory seminars, the mentor and mentee devise a plan for ongoing engagement. This may include monthly seminars, workshops, regular one-on-one meetings, or, in some instances, research projects supervised by the mentor [28,29]. The educational content of these sessions is aligned with the goals set in the previous stage [30]. During interactions, the mentor and mentee focus on knowledge transfer and the sharing of experiences.

Evaluation of the Mentoring Program

The final stage encompasses the transition between the mentor and mentee, enabling participants to achieve greater independence [22, 25]. The review revealed that several quantitative, qualitative, and mixed-methods approaches were utilized to evaluate the outcomes of the program. Studies utilizing mixed methods provided a more comprehensive perspective on the effectiveness of mentoring programs by examining outcomes through both quantitative and qualitative lenses. Indicators such as faculty promotions, increased research activity, and heightened satisfaction among faculty in teaching and research roles were reported as measurements of program success. Additionally, reductions in job burnout among academic staff members demonstrated the program's effectiveness.

Feedback from mentees was another valuable component in evaluating the program's implementation. Participants were invited to a final meeting to receive

course-related certificates and share their unique experiences throughout the program, which could inform future initiatives [12, 26, 29]. Critiques and suggestions from participants were utilized to enhance the methods employed in the program [24]. Evaluations conducted during the program allowed for adjustments, such as modifying mentor-mentee pairings, altering program duration, or revising implementation processes as necessary.

An additional advantage in evaluating the program was the feedback provided by mentees regarding its implementation. During this stage, all participants were invited to a closing meeting where they could receive course-related certificates. They were also encouraged to share their unique experiences from the program, which could be analyzed to inform future initiatives [14, 16, 21-22]. The constructive criticism and feedback from participants were instrumental in refining the methods used in the program. Evaluations were occasionally conducted throughout the program, allowing for necessary adjustments, such as altering the types of mentor-mentee pairings, modifying the program's duration, and making changes to the implementation processes [17, 25].

Discussion

In this systematic review, we investigated and synthesized evidence concerning the objectives, processes, implementation steps, and outcomes of mentoring programs. Faculty members are essential to the success of educational systems, and thus, the development of these individuals should be a top priority for educational institutions [20, 30]. The findings highlight that while various models for mentorship implementation exist, mentoring programs are generally effective in promoting both the professional and personal growth of individuals in higher education [31]. Numerous studies have documented the benefits of mentoring and assessed its effectiveness, focusing primarily on job-related experiences. Key indicators such as job satisfaction, competence, and research skills have significantly improved among participants [8, 25, 32].

Different mentoring approaches offer distinct advantages to educational institutions and faculty members. One particularly effective method is peer mentoring, where faculty of similar ranks support each other. Because participants in this form of mentoring often share similar life stages, they can comfortably engage in discussions about both professional and personal matters, including work-family balance [33-35]. Research suggests that peer mentoring not only fosters collaborative support but also enhances access to resources [33, 36]. Furthermore, some studies indicate that mentoring programs yield even greater benefits when implemented across disciplines. Qualitative studies

reviewed in this research indicate that mentoring relationships with individuals from other educational institutions and interprofessional mentors can provide invaluable experiences for mentees [37-39].

Additionally, research-focused mentoring programs can result in financial grants for faculty members and institutions involved [40-43]. In a qualitative content analysis conducted by Sabeghi et al. (2020) within the cultural context of Iranian faculty members, it was found that a peer mentoring program significantly improved personal well-being, professional interactions, and job satisfaction among faculty [34]. Considering the diverse benefits of mentoring programs for both faculty members and institutions, it is advisable to design and implement such programs across various universities in Iran [35].

The findings of our review also showed that several institutions have successfully employed distance education mentoring programs, resulting in positive outcomes [36, 44-45]. Many educational experts experienced in implementing mentoring programs are located worldwide, but logistical challenges such as high accommodation costs and time constraints may limit their physical availability [37]. A systematic review by Abbaspour et al. (2018) titled "The Components of Faculty Development in Iran and the World" concluded that none of the current programs were specifically targeted at promoting faculty development, with most relying on traditional classroom settings [31]. Furthermore, it was observed that many of the methods used for faculty development over the past few decades do not meet the current needs and challenges; they often focus on educational development and include workshops and seminars [46].

In the wake of the COVID-19 pandemic, suitable infrastructures for educational programs have been established, making distance education mentoring programs a feasible option for enhancing faculty development [37-39].

Our study demonstrates that the implementation of mentoring programs brings numerous benefits, such as increased self-confidence, a better understanding of organizational culture, policies, and philosophy, enhanced job satisfaction, personal and professional growth, career advancement, improved organizational vitality, better communication skills, greater access to research grants, social support advantages, and increased satisfaction among academic staff members [10, 12, 19, 23-26, 44].

Hubbard et al. (2021) utilized a mixed-methods approach to assess their mentoring program, which proved effective in evaluating such initiatives [46]. They noted that integrating quantitative data with qualitative insights regarding mentorship among faculty members produced more comprehensive outcomes, consistent with our findings. The mixed-methods approach likely offers a more nuanced perspective by examining various

aspects of the program. Despite our thorough efforts in conducting a comprehensive literature search, this systematic review may have limitations in coverage, as some studies may not have been identified due to database access restrictions resulting from sanctions.

Conclusion

Numerous methods exist for implementing mentoring programs, and the choice of method should be tailored to the specific context. A mentoring program designed in accordance with the university's objectives and the faculty's needs can significantly enhance their professional growth. This review's findings suggest that mentoring programs are advantageous for faculty development, as they can help diminish the dependence on traditional, time-intensive methods such as training classes, seminars, and workshops. Considering the rapid advancement of education via digital technologies, there is a strong recommendation for increasing the use of Distance Education Mentoring Programs in the future. For effective enhancement and promotion of these mentoring initiatives, it is essential for future research to adopt a mixed-methods approach to assess their implementation and outcomes thoroughly.

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