

Research Articles

Is there a role for formal mentorship programs in reducing burnout in surgical residency?: a literature review

Vivian W.Y. Leung¹, Xheni Konci¹ , Sarkis Meterissian^{2 a}

¹ Faculty of Medicine, McGill University, ² Faculty of Medicine, McGill University; Department of Oncology, McGill University; Department of Surgery, McGill University

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Background

Burnout in surgical training is well established. Nevertheless, it remains unclear how wellness interventions could decrease burnout in residency. This literature review aims to explore the role of formal mentorship programs on burnout in surgical residency.

Methods

A literature search was conducted on Medline, Cochrane Central and PsychInfo. Articles were screened and assessed for eligibility. From the eligible studies, data was extracted to summarize and provide an overview of existing mentorship programs and their effect on burnout in surgical residency.

Results

Seven studies, four correlational and three interventional, were included. The programs varied widely on mentor-mentee pairing strategy, time devoted to mentorship, activities with mentors and concurrent interventions. Mentorship programs had a positive or neutral effect on resident burnout in surgical residency.

Conclusions

Formal mentorship programs in surgery are scarce or under-reported in the literature. Based on our review, mentorship programs, if carefully implemented, may play a role in improving resident well-being.

BACKGROUND

Over the years, there has been an ever-growing concern, and awareness, of resident burnout and its multifaceted effects. One of the most widely adopted definitions of burnout is that of Christina Maslach's, who defines burnout as being composed of three dimensions: emotional exhaustion, depersonalization, and a low sense of personal accomplishment.¹ Burnout has been shown to affect an alarming proportion of up to 60% of residents and fellow trainees, leaving them with debilitating consequences.² In addition, the burden of burnout and psychiatric morbidity is higher in trainees compared to physicians, making residency a vulnerable time for mental health decompensation.³

The five to six-year journey of surgical residency training has often been described as a demanding, exhausting, yet rewarding experience. As a result, surgical residents are often exposed to harsh conditions which predispose them to various work-related stressors. For instance, elements which precipitate burnout in surgical residency include ex-

cessive stress and work dissatisfaction, daily work demands, high levels of debt, discourse with superiors, caring for critically ill patients, exhausting work hours, and multiple overnight calls.³⁻⁵ Additional factors such as being a female surgeon, as well as noting a gender gap in leadership roles and remuneration in the surgical workplace are contributors to burnout.⁶⁻⁸

Resident burnout is an issue that impacts both individual trainees and healthcare systems. Research has revealed that as a consequence of burnout, residents typically exhibit diminished productivity and patient care, fragmented patient-physician relationships, and elevated rates of medical errors.^{2-5,9-12} Burnout also leads to reduced access to medical care, as affected physicians are more likely to curtail hours, exhibit absenteeism or leave their practices altogether.³ Individuals experiencing burnout are also much more likely to engage in alcohol and substance abuse, have impaired interpersonal relationships, and contemplate suicide.^{3,9} As such, the importance of resident wellness is increasingly being recognized and addressed by various

^a **Corresponding author:** Sarkis Meterissian, MD, FRCS, FACS Research Institute of MUHC, Glen Site 1001 Decarie Boulevard Montreal, Quebec, Canada H4A 3J1 Phone: 514-934-1934 ext. 36631 Fax: 514-843-1503

means, one of them being the implementation of formal mentorship programs.

Despite this growing awareness, studies examining the effectiveness of wellness interventions on burnout in surgical residency are limited. Consequently, choosing a desirable and effective intervention to support resident well-being can present a challenge for surgical programs.

This review aims to explore the existing literature and summarize whether there is a role for formal mentorship programs in decreasing burnout in surgical residency. In addition, we aim to characterize existing mentorship programs, identify outstanding factors associated with program success, and report on resident satisfaction of such interventions. This will be the first review conducted on the subject matter of mentorship and burnout and may serve as a guiding reference for future implementation in surgical residency programs.

METHODS

THE LITERATURE SEARCH

The following databases were searched for relevant studies on September 4th, 2020: MEDLINE (via Ovid, 1946 to 2020); The Cochrane CENTRAL Register of Controlled Trials (via Wiley, Issue 9 of 12); PsycInfo (via Ovid). A peer-reviewed search strategy was developed in collaboration with a hospital librarian. The search strategy included text words and relevant indexing to identify studies on the role of formal mentorship programs regarding resident burnout during surgical residency. The following terms were included in the search strategy: [Mentor OR Mentee] AND [Surgical Resident/Intern/Trainee/Fellow] AND [Burnout OR Work-Life Balance OR Wellness OR Wellbeing OR Mental Health OR Quality of Life OR Anxiety OR Depression OR Job Satisfaction]. The MEDLINE strategy (Supplemental) was applied to all databases, with modifications to search terms as necessary.

SELECTION CRITERIA

Studies were first screened by a single reviewer using the following exclusion criteria: i) studies published in languages other than English, and ii) duplicates across the databases. Next, two independent reviewers screened eligible studies using the following exclusion criteria: i) participants who are not enrolled in a surgical residency program, ii) lack of a formal mentorship program, and iii) burnout not evaluated. Studies describing formal mentorship programs in surgical residency and its effect on resident burnout were included. Subsequently, all selected articles had a full-text screen by a third, independent reviewer prior to being included for final analysis (Figure A).

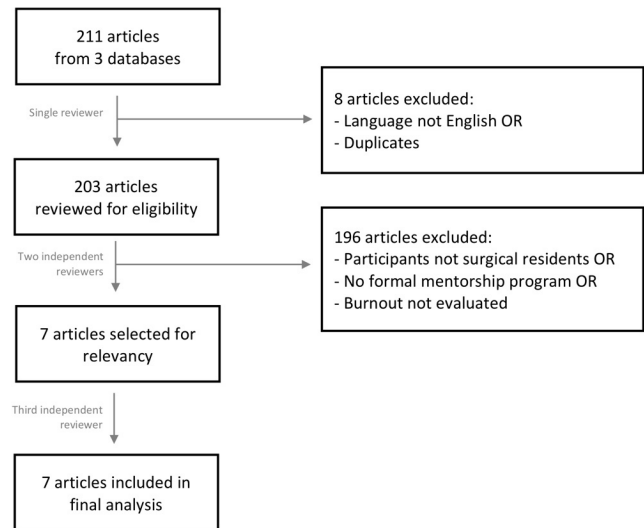


Figure A. Flowchart of literature search

DATA EXTRACTION

For each article, the following items were extracted: author, study year, study design, participants (type of residency and country), length of mentorship program, mentor-mentee pairing strategy, details of mentorship activities, interventions concurrent to a mentorship program, overall effect on burnout, and resident feedback of the program.

According to the McGill University Faculty of Medicine and Health Sciences policy, our study was exempt from an Institutional Board Review.

RESULTS

Our search strategy and selection criteria yielded seven relevant articles (Table 1). Out of the seven, four were correlational studies (Elmore, 2016; Janko, 2019; Marchalik, 2019; Oladeji, 2018) and three were interventional studies (Ares, 2019; Salles, 2017; Zhang, 2017). The studies included the following specialties: neurosurgery, general surgery, urology, orthopedic surgery, otolaryngology and vascular surgery. The studies took place between 2011 and 2019. Mentorship programs were implemented for at least one year in interventional studies. All but one of the studies took place in the United States, with a single study occurring in Canada (Zhang, 2017). Mentor-mentee pairing strategies included both self-selection and pre-assigned mentorships and occurred mainly between residents and faculty mentors. Communication between mentors and mentees varied from daily to a yearly frequency. Other concurrent interventions to mentorship programs included physical, psychological, social and educational initiatives.

Table 1. Characterization of formal mentorship programs in surgical residency.

Author & Year	Study Type	Residency Program	Mentor-Mentee Pairing Strategy	Mentorship Characteristics	Other Concurrent Interventions
<i>Ares 2019</i>	Interventional	Neurosurgery USA	Each resident was assigned a faculty mentor from their subspecialty of interest.	Meeting frequency: twice a year. Mentors were trained in assessing signs and symptoms of burnout.	Physical: Free access to hospital gym, group gym visits once a week. Educational: Wellness lecture series every second month.
<i>Elmore 2016</i>	Correlational	General Surgery USA	Mixed.	Mixed professional or personal support.	Not reported.
<i>Janko 2019</i>	Correlational	Vascular Surgery USA	Not reported.	Not reported.	Not reported.
<i>Marchalik 2019</i>	Correlational	Urology USA	Not reported.	Not reported.	Not reported.
<i>Oladeji 2018</i>	Correlational	Orthopedics USA	Mixed: 51.9% selected their mentor, 32.9% were assigned a mentor.	Communication frequency: daily (3.8%), weekly (21.0%), monthly (43.3%), biannually (26.1%), annually (5.7%).	Not reported.
<i>Salles 2017</i>	Interventional	General Surgery USA	Each junior resident was assigned a senior resident.	Funded quarterly lunch meetings.	Physical: 24-hour access to fridge with healthy snacks, after hours guide with list of hikes and biking trails. Psychological: Confidential group session with a psychologist each week and urgent individual sessions. Social: Quarterly organized and funded social events.
<i>Zhang 2017</i>	Interventional	Otolaryngology Canada	Each resident was assigned a main mentor for general guidance and several supplemental mentors for their domain expertise. First year residents were assigned mentors based on personality, areas of expertise and interest in mentorship, and had the option to switch mentors at the end of the year. Second to fourth year residents selected their mentors from a list.	Meetings with main mentors once a month and as needed. Meetings with supplemental mentors as needed.	None.

The main assessment tools used were electronic surveys made up of multiple-choice questions, open-ended and multiple-choice mixed questions using 5- to 7-point Likert scales. Across six out of the seven studies, burnout was evaluated using components of the Maslach Burnout Inventory (MBI), including emotional exhaustion (9 items), depersonalization (5 items) and/or personal accomplishment (8 items). The MBI items are scored using a 7-level frequency from “never” to “daily”. The last study (*Janko, 2019*) quantified burnout using the Oldenburg Burnout Inventory (OLBI). This validated scale measures exhaustion and depersonalization, with each of the two subscales having four positively phrased answers and four negatively phrased answers, with options between 1 (totally disagree) and 4 (totally agree). Other standardized questionnaires used to measure resident wellbeing, stress or mental health included: the Multidimensional Scale of Perceived Social Support (MSPSS), the Patient Health Questionnaire 9 (PHQ9), the Dupuy Psychological General Well-Being Index (PG-WBI), the Perceived Stress Scale (PSS), and the World Health Organization Quality of Life (WHO-QOL).

Out of the three interventional studies, one (*Zhang, 2017*) found that a formal mentorship program reduces burnout ([Table 2](#)). In this study, both emotional exhaustion and depersonalization decreased from “high” to “low”, while the level of personal accomplishment increased from “low” to “high” following the implementation of a 12-month formal mentorship program. Residents also reported decreased levels of stress and improved scores for overall quality of life, including physical health, psychological, social relationships and environment following program implementation. Overall satisfaction with the program was 0.90 on the Likert-scale with highest scores for “providing a role model” and “having someone to turn to in difficult times”. The other interventional studies (*Ares, 2019; Salles, 2017*) did not find a significant change in the level of burnout before and after implementation of their respective interventions.

Three out of the four correlational studies found structured mentorship programs to be protective against burnout (*Elmore, 2016; Janko, 2019; Marchalik, 2019*). All four correlational studies were national surveys of surgical residents from their respective programs across the United States. In the first study (*Elmore, 2016*), data from six hundred and sixty-five general surgery residents showed that having a structured mentoring program was associated with lower levels of burnout on every subscale. Overall, 75.7% of residents without mentorship met criteria for burnout compared to 62.7% of residents with a structured mentorship program. In the second study (*Janko, 2019*), 90.5% of vascular surgery residents without a mentor scored in the upper three quarters of the highest burnout for the sample population, compared to 69.6% of residents with program mentorship. Finally, the prevalence of moderate to high burnout was 74.6% in urology residents without access to mentorship, compared to 60.2% for residents with access to men-

torship in the third study (*Marchalik, 2019*). The last study (*Oladeji, 2018*) did not find a significant association between formal mentorship and the prevalence of a high level of burnout.

DISCUSSION

Surgical residency is an exceedingly rewarding but demanding training involving long hours and a high-stake working environment. Resident burnout is highly prevalent across surgical residencies.⁵ Finding ways to reduce burnout is beneficial for overall trainee health and performance, as well as for quality patient care.

Despite a high need for wellness initiatives, in our review, we found only seven studies examining the role of mentorship programs on surgical resident burnout ([Table 1](#)) and only three prospective interventional studies. It remains unclear whether the low number of studies indicates a low prevalence of such programs or, alternatively, an under-reporting of existing programs in the literature. The participants represented a wide range of surgical specialties, highlighting the shared burden of burnout across surgical fields. The mentee-mentor pairing strategies varied across studies in number of mentors, type of mentor (senior resident vs. faculty), and type of assignment. Of note, one interventional study (*Zhang, 2017*) which showed a significant decrease in burnout, employed assigned faculty mentors in the first year of residency with the option to choose mentors in later years. Within this model, each resident was assigned a main mentor and several supplemental mentors. The matching process was based on pre-filled forms evaluating personality, area of expertise and interest in mentorship.

Based on our review, mentorship programs do not seem to play a positive role on resident burnout in surgical residency. However, clearly more studies are needed in this area. Out of the three interventional studies, one reported a significant decrease in burnout after the implementation of a mentorship program (*Zhang, 2017*). It is important to note that this study did not implement other concurrent interventions, suggesting that a more focused approach may be more efficacious to achieve results. We observed that this program had an elaborate mentor-mentee pairing model, the most frequent mentor-mentee contact (ie. q1 month vs. q3 months or q6 months) and the highest participation. The programs which did not report a significant change in burnout had a higher number of participants, a single mentor as opposed to multiple mentors, fewer suggested meetings with mentors and lower overall participation. Surprisingly, studies with other simultaneous and more costly interventions, such as free access to gyms, wellness lectures and psychological resources, did not report a detectable change in burnout.^{13,14}

Table 2. Effects of formal mentorship programs on burnout in surgical residency.

Study Author	BURNOUT		Effect of Mentorship on Burnout	Resident Satisfaction with Mentorship
	Mean MBI Pre-Intervention	Mean MBI Post-Intervention		
<i>Ares</i>	(n=25) Emotional exhaustion: 7.6 (LOW) Depersonalization 6.5 (MODERATE) Personal accomplishment 15.9 (HIGH)	(n=25) Emotional exhaustion: 7.4 (LOW) Depersonalization 5.8 (MODERATE) Personal accomplishment 16 (HIGH)	Not significant.	Not assessed.
<i>Salles</i>	(n=40) Emotional exhaustion 3.52 (LOW) Depersonalization 2.92 (LOW) Personal accomplishment 5.68 (HIGH)	(n=50) Emotional exhaustion 3.50 (LOW) Depersonalization 2.89 (LOW) Personal achievement 5.71 (HIGH)	Not significant.	On average the program was rated as somewhat valuable. 8 out of 9 respondents provided positive comments on the value of the program.
<i>Zhang</i>	(n=8) Emotional exhaustion 47.6 (HIGH) Depersonalization 50.6 (HIGH) Personal accomplishment 16.5 (LOW)	(n=8) Emotional exhaustion 14.9 (LOW) Depersonalization 20.1 (LOW) Personal achievement 42.5 (HIGH)	Protective against burnout. (p<0.0001)	0.90 overall satisfaction on Likert-scale. Highest scores for "providing a role model", "feel more supported", and "having someone to turn to in times of difficult" at 0.92.
	Without Program Mentorship	With Program Mentorship		
<i>Elmore</i>	75.7% met criteria for burnout on any subscale.	62.7% met criteria for burnout on any subscale.	Protective against burnout. (p<0.001)	Not assessed.
<i>Janko</i>	90.5% met criteria for higher three quarters of burnout.	69.6% met criteria for higher three quarters of burnout.	Protective against burnout. (p<0.01)	Not assessed.
<i>Marchalik</i>	74.6% met criteria for mod-high burnout.	60.2% met criteria for mod-high burnout.	Protective against burnout. (p=0.019)	Not assessed.
<i>Oladeji</i>	34.7% met criteria for high burnout.	30.7% met criteria for high burnout.	Not significant.	Quality of mentorship: 42.6% very satisfied/satisfied, 38.1% neutral. Satisfaction with mentor: 77.2% very satisfied/satisfied, 15.2% neutral. Importance of mentorship with respect to development as surgeon: 61.4% very important, 34.4% moderately important.

MBI = Maslach Burnout Inventory

Table 3. Challenges and strengths of formal mentorship programs in surgical residency.

Mentorship Program Challenges	Mentorship Program Strengths
<ul style="list-style-type: none"> • Use of an instigator, coordinating power and time from surgical programs. • Residents experiencing higher burnout may be less motivated to partake in mentorship programs and could miss out on its benefits. • Potential extra cost to the faculty. • Added time commitment to long working hours may be viewed negatively by mentors or mentees. • Do not address other fundamental stressors, such as long working hours. 	<ul style="list-style-type: none"> • Increase sense of belonging and faculty support. • Needs and benefits continue throughout surgical residency years. • Provide networking opportunities to support professional development, including increased academic productivity. • Overall low monetary costs of implementation. • Demonstrate a commitment to resident wellness, which may attract more medical students to surgical programs. • May reduce surgical residency attrition rates.

Three out of the four correlational studies showed a protective effect of structured mentorship programs on burnout. Authors of one study emphasized the importance of a sense of community in the workplace to prevent burnout and suggested that mentoring relationships can help with early identification of trainee burnout and, importantly, aid trainees to develop strategies to cope with their individual experiences (Elmore, 2016). Of note, several modifiable factors associated with burnout were identified from our search, including the addition of formal mentoring programs and limiting violations of the 80-hour work week (Janko, 2019). Given these findings, and a previously reported emphasis on administrative support in preventing attrition among surgical residents,¹⁵ the addition of formal mentorship programs could play a role in lowering both burnout and attrition rates in surgical residency through increasing a sense of support and community for surgical trainees. Trainees may feel more comfortable expressing personal or professional challenges encountered in residency without fear of negative consequences if they have strong relationships with a mentor.

In the last two correlational studies, mentorship had a protective effect for compiled moderate to high levels of burnout (Marchalik, 2019) but did not have an effect on high levels of burnout alone (Oladeji, 2018). It is possible that trainees experiencing high levels of burnout may not respond as well to mentorship, which requires an active participation from involved parties.

The causes of burnout are multifactorial and complex. Mentorship alone may be insufficient to combat burnout in the workplace. Dean et al. reframe the concept of clinical distress by shifting the focus away from burnout, which suggests a problem residing within individuals, to one of moral injury: “the concept of knowing what patients need but being unable to provide it due to constraints that are beyond our control”.¹⁶ Institutional factors, such as decreased time dedicated to individual patients, high demands on productivity, long waiting times and insurance barriers to optimal patient care, cannot be solved with mentorship. However, if implemented correctly, mentorship can increase a sense of faculty support and community for residents beyond individual-based wellness initiatives, such as wellness lectures, yoga classes, etc. Therefore, although mentorship may not be a definite solution to decreasing distress, carefully implemented mentorship programs can be a part of a systems-based solutions strategy that focuses on increasing clinician

satisfaction and patient care.

There are several limitations to the findings from studies included in this review. Our final analysis included only seven studies, pointing to the lack of data on the role of mentorship and burnout. Given that all studies used self-reported questionnaires as a form of assessment, the outcomes may have been influenced by resident motivation to partake in the survey. In addition, the possibility of participant bias and pressure to respond positively cannot be excluded, especially for those in small surgical programs. Other limitations include insufficient mentorship program length to detect change, study underpowering and multiple confounding factors in addition to mentorship. Finally, although all participants were enrolled in surgical residencies in North America, in reality, each surgical specialty and program differs from one another and similar mentorship structures or wellness strategies may not have the same impact, and should therefore, not be generalized.

Throughout our review, we identified many challenges and strengths of formal mentorship programs important for consideration prior to implementation, extending beyond an effect on burnout alone (Table 3). An increased sense of support from faculty, increased resident satisfaction, enhanced learning and improved academic productivity are some notable findings following the implementation of formal mentorship programs in interventional studies.^{17,18} Mentorship programs are becoming more popular in surgical residency programs but, unless they are implemented carefully with a comprehensive design, their effects on resident well-being may be limited.

CONCLUSIONS

Review of current literature shows formal mentorship programs have failed to show a consistent improvement in resident well-being. However, our review underscores the importance of careful implementation with identification of important program challenges that should be considered in planning a mentorship program in a surgical residency.

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SUPPLEMENTARY MATERIALS

Appendix

Download: <https://www.ijsed.com/article/25104-is-there-a-role-for-formal-mentorship-programs-in-reducing-burnout-in-surgical-residency-a-literature-review/attachment/63867.docx>
