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Review Article
Resident Attrition in Post Graduate Surgical Training

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Abstract Resident attrition is a significant issue facing graduate surgical education, with broad implications for trainees, their families, educators, and society at large. Resident attrition is costly and often may represent a poor initial selection process, inadequate training in medical school, or insufficient feedback and mentoring while the resident is in the postgraduate program. Promoting an environment that encourages mentorship may be an important first step to help residents maximize their professional potential. The successful mentoring of surgical residents is crucial because the entire specialty depends on how today's residents face tomorrow's challenges.

Keywords resident; attrition; postgraduate medical education; mentor

1. Introduction

Residency is known to be a stressful, demanding undertaking, and surgical training can be particularly challenging physically, intellectually, and emotionally [37]. When residents leave the program, the entire homeostasis of the program gets affected starting from resident learning to patient care. Particularly now with the 80 hour work week restrictions in place, attrition causes tremendous scheduling difficulties that reduce services to patients, disrupt continuity of care, and stress the remaining residents resulting in demoralization and further attrition [23]. The workload of remaining residents increases and sometimes in such situations service requirements may take precedence over teaching. Moreover, gaps appear in the residency structure that may have to be filled with medical officers who are just there to provide service requirements and are not interested in the academic aspects of the program, which adversely affects the University objectives.

2. Literature search strategy

In order to analyze this problem, literature search was done using Medline, Google Scholar, Eric, and Scopus databases. In addition to databases, controlled vocabulary, synonyms and truncation were used to identify appropriate references. Boolean operators were used to combine search terms and references from 1985 onwards were included.

3. Literature review

Resident attrition is costly and often may represent a poor initial selection process, inadequate training in medical school, or insufficient feedback and mentoring while the resident is in the postgraduate program [23]. Although data are accumulating, research on resident attrition has been limited regarding identifying specific cohorts who may be less likely to complete training.

Significant variations have been reported in the rate of attrition among surgical residency programs [42], ranging from 14% to 32% [1,4,9,12,21]. Even though attrition is a well-known problem, the resident and program characteristics associated with attrition are poorly understood [42]. Existing studies to date consist of retrospective single institution series [1,9,23] and surveys of program directors [19, 22,26].

According to program directors, the reasons cited for leaving a surgery residency are, in order of prevalence, work hours and lifestyle, changes in specialty interest, relocation to be closer to family, the nature of surgical practice, and financial burden [8]. Attrition often starts with the application process in which most residents are drawn to the university's overall reputation rather than the actual character of the department to which they are applying [23]. These applicants may not be knowledgeable about whether the department's strengths match their own career interests. When the resident finally arrives on the campus, the character of the program is often revealed instantly. Most faculty members assume that bad residents drop out and the best candidates finish the program, suggesting that the problem is the resident and not the program [23]. Most know this is not true, and evidence suggests that residents who persist and those who leave are equally qualified. Essentially it is lack of integration into the departmental community that contributes most heavily to the departure of the residents [23].

Yeo et al. [42] conducted a prospective analysis of general surgery residents ($n = 3,959$) after the 80 hour

reduction in work limit mandated by the Accreditation Council for Graduate Medical Education (ACGME) in 2003, and reported a 19.5% cumulative risk of resignation across all years. Attrition was the highest in PGY-1 (5.9%), PGY-2 (4.3%), and research year(s) (3.9%). Women were more likely to leave programs than men (2.1% vs. 1.9%). Of several program/resident variables examined, postgraduate year-level was the only independent predictor of attrition in multivariate analysis, which could afford educators a target for intervention. The reality is that when the residents walk in the faculty's office and tell them they are leaving, the idea has been in their heads for many months and the program director may have been blind to it all along. It is often cited that the absence of supportive programs such as "social events" or other "get togethers" influences attrition where the solution to stress is by withdrawal rather than a supportive environment. Support programs are not only for stress but also for things like family planning during training, diversity, and untraditional thinking (I want to get an MBA during my laboratory years [23]). Then there are physical problems such as chronic illness, tremor, and substance abuse. Most residents resign because they underestimate the stress associated with surgical work [23]. When this is coupled with an unanticipated death while on service, a new relationship or child, or difficulty paying the bills, resignation is eminent. More and better information and exposure before residents choose their specialty during medical school could conceivably reduce attrition and allow more residents to make informed choices. Programs need to allow flexibility for nonprofessional life events so that residents can deal with outside demands.

In 2004, Sargent et al. [36] examined for the first time job stress, satisfaction, and the psychosocial functioning of twenty-one orthopedic residents using three validated instruments (i.e., the Maslach Burnout Inventory, the General Health Questionnaire-12, and the Revised Dyadic Adjustment Scale). Their results revealed a substantial level of burnout with scores in the upper third on both emotional exhaustion and depersonalization. Other factors associated with burnout included increases in work hours per week, conflict between work and home life, stress in relationships with faculty, nursing staff, and senior residents, debt load, and perceptions of work as stressful. Protective factors included being a parent, spending more time alone with a spouse, having a father who is or was a physician, and deriving greater satisfaction from speaking about concerns with colleagues, friends, and family.

Davenport et al. [8] surveyed 844 residents across 52 hospitals using 91 items derived from the literature and identified by resident focus groups. The strongest factor related to residents' job satisfaction was the quality of care they perceived being delivered to the patient. The next most important influences of resident job satisfaction in their study were effective ancillary staff/systems and empathetic nurses. The residents' perception of the appreciation from attendings, the attendings' openness to suggestions regarding care, balance of teaching and clinical activities, and teaching skills were also important in influencing resident job satisfaction. Interestingly, the systems and scutwork factors were stronger influences of job satisfaction than the relationship with the attending. Specific activities that residents labeled scutwork in the focus groups were activities that were related to inefficient systems (e.g., "wait because a computer system is down") or more frequently, jobs they considered not theirs (e.g., "expedite OR clean-up for the next patients" and "put in peripheral IVs"). Residents in their survey reported four hours per day on average of what they considered scutwork. In addition to too much scutwork, they perceived excessive erroneous/unnecessary paging on service. This factor was significant in predicting aggregate satisfaction at hospitals. Importantly residents in their study often perceived themselves as carrying the burden for shortfalls and systems of care at hospitals. Resident educators need to work hard to shift the focus from residents as employees to residents as students. Davenport et al. [8] concluded that for this shift to occur, hospitals will need more effective/efficient systems and staffing to relieve residents of the clinical-care burden.

4. Identification of solutions

Resident attrition continues to be a significant issue facing graduate surgical education, with broad implications for trainees, their families, educators, and society at large [42]. Strategies aimed at resident selection, education of medical students about surgical life, role modeling and mentoring maybe worthy approaches. It is therefore evident that many complex factors are at play in the decision to leave training, such as resident interactions with their colleagues, attending surgeons, and patients, as well as perceptions about the complex and rapidly evolving economic and local health care setup. A discussion about these factors will enable us to identify the most appropriate solution for this predicament.

4.1. Leadership

Leadership is a process by which a person influences others to be accomplished while maintaining cohesiveness. Leaders do not command excellence; they build excellence [23]. To reach excellence, one must be a leader of good character. Leadership in academic surgery remains challenging [3]. Goal setting conveys a strong vision of where one wants to be in the future. Goals must be realistic and attainable and should improve the service. One of the key components of achieving the goals is supervising. It includes giving instruction and inspecting the accomplishments of a task. However, there is a narrow band of adequate supervision. On one side of the band is oversupervision (micromanagement), and on the other side is undersupervision. Oversupervision stifles

initiative, breeds resentment, and lowers morale and motivation. Undersupervision leads to miscommunication, lack of coordination, and the perception that the leader does not care [23]. Evaluating is part of supervising. It also means giving feedback on how well something is being done and interpreting that feedback [30, 38].

4.2. Mentoring

The word mentor actually came from the story of Mentor, who was a friend of Odysseus and responsible for the education of Odysseus's son Telemachus. Webster's definition is "a trusted counsellor or guide"; however, Drotar defined it as "the privilege and opportunity to teach and learn together with a student/junior colleague in the context of mutual respect, trust, and coordinated goals" [23]. Mentoring produces a special spark, reveals new aspects of things almost instantaneously, and remains clandestine in today's education and training. Recognizing the importance of mentoring, many institutions have created formalized mentoring programs to assist with career advancement [23].

Lukish et al. [24] conducted a survey to examine the viewpoints of the Resident and Associate Society of the American college of Surgeons (RAS-ACS) membership regarding current training and quality of life-related issues. The survey was completed by 235 members who represented 5% of RAS-ACS members. General surgery residents constituted 84% of the respondents. Personal satisfaction (64%) and mentorship (49%) were top factors for respondents to pursue surgical training. The most important factor, personal satisfaction, is difficult to use as a recruitment tool and would be more consistent with defining a surgical personality type. Several studies have supported the idea that students interested in surgery have many character traits that are desirable in practicing surgeons: they are aggressive, self-confident, competitive, authoritarian, and are more resistant to stress [2, 14, 24, 43]. Personality inventories can be employed by medical schools with the presumption that personal satisfaction will be obtained in doing a job that matches one's personality with the intrinsic aspects of the work and working with individuals of similar personality [2, 15, 24]. Mentorship plays an important role and nearly half of the respondents reported this as a top factor.

One of the major obstacles to designing teacher education programs directed at helping supervisors create effective teacher-learner relationships is the huge range of potential difficulties in supervisory relationships [39]. Greben [16] suggested that supervisory style should follow a continuum based on resident level and experience. Nigam et al. [27] provided guidelines for the "supervisory relationship", "supervisory dynamics", and "fundamental issues" in one-to-one psychotherapy supervision. Chessick [7] suggested a number of potential administrative moves that could avoid disappointment in supervisory relationships:

Do not select residents and supervisors on the basis of service needs, increase humanities exposure for residents (to increase aspects of human experience), provide regular seminars on supervision for supervisors, assign supervisors to the type of resident with whom they would work best, ensure that each evaluates the other, and make sure that there are more supervisors than residents so that there is a flexibility with regard to supervisor choice.

4.3. Assimilation

Another key element to prevent attrition is assimilation. People of different backgrounds come to see themselves as part of a larger family. The assimilation process provides a refuge for the diffuse nature of different people. One key element for facilitating assimilation is embracing diversity. This involves developing an atmosphere in which all can ask for help and in which one is not viewed as weak. It will permit inclusion of people who are different in an informal gathering and create team spirit in which every member feels a part. The more social programs are in place, the lower is the attrition. These programs provide forums for transfer of information that every resident needs to succeed in a residency program; information that is beyond cognitive knowledge, manual dexterity, and clinical judgement. Organizational leadership within a department should ensure that there is a departmental lounge that embraces residents, that there is a detailed orientation for new residents, that there is an advisor system in place (and that they are meeting), and that program goals and objectives are made clear. The bottom line is that when the resident feels qualified for his/her new post, the risk of withdrawal is greatly reduced. Furthermore, the closer perceived fit between the person's perception of himself/herself and the so-called ideal candidate, the more likely is persistence [23].

Some authors look at attrition positively. Their contention is that those who leave surgery residency are much happier in their lifestyle-favorable career [42]. They recommend that programs with 5 or more residents should match an extra resident. They argue that this is not a pyramid. Rather it is an accommodation for voluntary attrition.

Some educationists have proposed that the selection of residents needs to be revisited [42]. They contend that perhaps we select students who want to be surgeons in their mind but then find that they actually do not want to practice surgery later. They hypothesize that this is probably because of an inadequate understanding of the surgical lifestyle. Maybe we should consider changing the way we expose students who are interested in surgery to the field, perhaps by giving them additional surgical experience in the early part of their fourth year.

5. The way forward

Mentoring programs appear to play an essential role in creating a learner-centered environment by which

professional and humanistic values, attitudes, and behaviors are cultivated in residency training [40]. Investigators have shown that mentorship is an effective and important paradigm in medical education [13]. In a systematic review of the medical literature, Sambunjak et al. [35] noted that mentorship had a substantial impact on personal development, career guidance, career choice, and research productivity. Residents with surgical mentors are less likely to be discouraged by "surgeon's lifestyle", especially when the personalities of the resident and the surgeon are agreeable [2, 10, 20, 24].

In a study conducted at University of California, San Francisco, medical students rated having a research mentor as the most important factor in influencing their specialty choice [29, 35]. A survey among pediatric residents showed that nearly 80% of the respondents felt that having a mentor was very useful or critical to surviving residency [13]. Similar to those studies, Flint et al. [13] found that 96% of responding orthopedic residents considered mentoring and mentorship important elements of their education and professional development. In fact, 95% of the respondents believed that mentoring should be part of their residency program [13].

By some estimates, the teacher-learner relationship explains roughly half of the variance attributed to the effectiveness of teaching [39]. The supervisor-resident relationship forms a model for future doctor-patient relationships, and the skills developed from resolving issues in the teaching-learning relationship could be applied to relationships with patients [7, 16, 18, 25, 32, 33, 34, 39]. The few existing studies in this area in medicine indicate that there is room for improvement in supervisor-resident relationships [39]. Farber et al. [11] noted that conflict between supervisors and trainees was under-recognized in an internal medicine setting. The failure to find important relationship issues in a study that looked at stress in surgery residents was interpreted by Buckley and Harasym [6] largely as a result of the social climate of surgery residency programs in which people who complained could be seen as "weak".

In the past, mentorship role was taken on largely by academic surgical faculty at medical schools. Currently, many processes that are outside of the surgeon's control have served to limit the interaction between surgeon and resident. Increased surgery volumes and administrative, clinical, and research commitments have made it a formidable task to find the time to actively mentor residents [24].

The goals of mentoring are to encourage strategic thinking and career building [5]. It also provides a safe place where the mentee can ask questions and share difficulties. The mentor needs to be accessible and approachable and understand the difference between himself/herself and the mentee [23]. The mentor must provide constructive criticism of the mentee's work and the mentee's approach. The mentor must set goals, focus on outcomes, track progress, offer empathetic support, offer a variety of rewards, and ask challenging questions. Today, an effective mentor must be able to provide guidance in balancing training, commitment, personal growth, wellness, and family [28]. It has also been suggested that the most effective mentoring may be shifting from a one-way teacher-protégé model to a power-free, two-way mutually beneficial relationship. Strategies for effective mentoring remain similar to that of effective leadership, encompassing a positive attitude, open-mindedness, inter-relations, discovery, confidence, recognition of individual strengths, and trust. Above all, effective mentoring requires confidentiality. Loss of trust kills any mentoring program. Mentoring remains a multi-faceted endeavor with many elements, and there is no single approach that works in all situations [23].

Pellegrini Jr. identified two critical attributes to make an effective surgeon mentor: the ability to "revel in succession planning for the next generation" and the "skill of deriving personal satisfaction from the accomplishments of the protégé as a direct and unspoken extension of the mentor's own achievements" [31]. Wilson proposed guidelines for developing an effective mentoring program, including quarterly mentoring meetings, collecting subjective and objective data regarding the accomplishments of the mentoring relationship, having mentors participate in workshops to improve mentoring skills, ensuring that mentors have sufficient experience and perspective in their field, and ensuring that core values and career plans are established in the first few sessions [41]. Both Wilson [41] and Hill and Boone [17] believed that the mentor should be chosen or assigned on the basis of the matching of professional interests and the personal attributes of the mentee [13].

To summarize, attrition is a continuing challenge in postgraduate medical education. It should be expected, and a zero attrition-rate environment is an unrealistic expectation. At times attrition may be functional and may have benefits for the individual and the program. Although the selection process remains an important exercise in striving for a "goodness of fit", in the end, the environment that one enters will often govern the rate that attrition will occur [23]. We must strive to improve residents' perceptions and experiences with effective mentors, role models, and career guidance. Promoting an environment that encourages mentorship may be an important first step to help residents maximize their professional potential. As teachers, it is our responsibility to optimize the personal and career development of our residents. The successful mentoring of orthopedic residents is crucial because the entire specialty depends on how today's residents face tomorrow's challenges. Orthopedic department needs to create a culture that supports mentoring, including educating and rewarding faculty members for successful mentoring.

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