

Research Article

Initial Characterization of Internal Medicine Resident Resilience and Association with Stress and Burnout

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Introduction. Burnout is prevalent in medical trainees. Little data exists on resident resilience. **Methods.** Anonymous surveys were provided to a convenience sample of internal medicine residents. Resilience was assessed using the Connor-Davidson resilience scale. Responses were categorized into low (<70), intermediate (70–79), and high (80–100) resilience. **Results.** 77 residents from six institutions completed surveys. 26% of residents had high resilience, 43% intermediate, and 31% low. The mean resilience score was 73.6 ± 9.6 and lower than the general population (mean 80.4 ± 12.5 , $p < 0.001$). Trainees with high resilience were more likely to never have stress interfere with their relationships outside of work (high: 40%; low: 0%; $p < 0.001$). High resilience residents were more likely to have the skills to manage stress and burnout (high: 80%; low: 46%; $p = 0.02$) and less likely to feel inferior to peers (high: 20.0%; low: 70.8%; $p < 0.001$). There was a trend towards those with high resilience reporting less burnout (high: 40.0%; intermediate: 27%; low: 16.7%; $p = 0.08$). Only 60% report a program outlet to discuss burnout. **Conclusions.** There is a wide range of resilience among IM residents and scores were lower than the general population. Low resilience is associated with more stress interfering with relationships, feeling inferior to peers, and fewer skills to manage stress and burnout.

1. Introduction

Burnout among residents is widespread and is associated with depression, suicide, and poor clinical performance [1–3]. While depression across the entire medical profession is at least as common as in the general population, studies looking at depression and depressive symptoms in medical and surgical residents place the prevalence higher, at nearly 28% [1, 2]. Further studies have shown that symptoms of depression in medical trainees are associated with perceived medical errors, increased work hours, and stressful life events [4]. Despite increased recognition of burnout in residents, little data exists on how it relates to resilience and few interventions focus on resident resilience.

Resilience is the ability to adapt well or thrive in the face of adversity [5]. It is important to cultivate resilience in trainees to enhance quality, promote wellness, and sustain the workforce [6, 7]. Resilience training in residents has been highlighted recently as an important area for graduate

medical education (GME) training, although there have been few studies that have sought to define resilience levels in physicians [6, 7]. A 2008 multicenter study of medical and surgical interns found that baseline resilience scores in first year residents were significantly less than resilience scores in the general population and correlated with depression scores over a 6-month period [8]. However, no studies have evaluated resilience further across the GME continuum and none have evaluated how resilience relates to burnout. Although many resident interventions have targeted burnout and wellness, little is known about the ability to augment resilience in medical trainees through education. One resilience program designed for a family medicine residency program demonstrated acceptance by trainees and increased self-care activities [9]. Our objective was to complete a preliminary characterization of internal medicine (IM) residents' resilience and how resilience relates to stress and self-reported burnout in medical trainees through surveys of IM residents from multiple institutions in Northern Illinois.

TABLE 1: Resident resilience and burnout survey measures.

Resident survey measures	Number of residents ($n = 77$)	% of residents
<i>Resilience</i>		
High resilience on CD-25	20	26
Intermediate resilience on CD-25	33	44
Low resilience on CD-25	24	31
<i>Personal burnout</i>		
Never or rarely feeling burnout	21	27
Stress from work has never interfered with patient care	13	17
Having the skills necessary to manage stress and burnout	54	70
<i>Burnout training</i>		
Burnout is an important issue during residency	71	92
Received training on burnout during residency	43	56
Received training on burnout during medical school	51	66
Having an outlet within their program to discuss stress and burnout	46	60
<i>Medical errors</i>		
Direct involvement in medical errors	56	74
Witnessed medical errors (not directly involved)	75	97
Never reported a directly involved medical error	47	61
Never reported a witnessed medical error	54	70

2. Methods

Anonymous surveys were provided to IM residents from all years attending the 2014 Northern Illinois Regional American College of Physicians Associates meeting in October 2014. This is an educational conference held annually for residents to network and present research. Not all residents attending the conference are presenters. Participation was voluntary, but as an incentive, participants were entered into a raffle to receive a gift card after completing surveys. Baseline resilience was assessed using the Connor-Davidson resilience scale (CD-25), a validated 25-item self-report scale [5]. Responses were categorized into low (<70), intermediate (70–79), and high (80–100) resilience based upon previous literature. Residents were also surveyed on burnout, resilience training, and involvement in medical errors using Likert scale questions ranging from “strongly disagree” to “strongly agree” (Supplementary Survey in Supplementary Material available online at <http://dx.doi.org/10.1155/2016/3508638>). This portion of the survey was piloted with a group of first-year residents at the University of Chicago during the spring of 2014.

Descriptive statistics were examined using Stata version 13.0 software (StataCorp LT, College Station, TX). Chi-square tests, t -tests, and trend analysis for proportions were used as appropriate to compare different resilience groups. This study was granted exemption status from the University of Chicago Institutional Review Board.

3. Results

In total, 254 residents attended part of the meeting and 77 residents (30%) completed surveys. Participants were from six residency programs; however, data was not complete for

how many residents were from each institution. Residents surveyed were both categorical (residents who would complete internal medicine residency) (63%, 49) and preliminary residents (residents who would complete only one year of internal medicine prior to their chosen specialty) (13%, 10) with 23% (18) of residents not responding to this question. Other demographic questions including gender and age had high nonresponse rates.

The majority of residents believed burnout is an important issue during residency (92%) (Table 1). About half (56%) received training on burnout during residency and 66% received training on burnout during medical school. Only 60% of residents reported an outlet within their program to discuss stress and burnout and 70% reported the skills to manage stress and burnout (Table 1). When questioned about burnout, only 27% of residents reported low levels of burnout (never or rarely feeling burnout) (Table 1). Similarly, only 17% of residents reported that stress from work has never interfered with their patient care (Table 1).

CD-25 resilience scores showed that 26% (20) of residents had high resilience, 43% (33) intermediate, and 31% (24) low (score range 40–100, mean 73.6 ± 9.6) (Table 1). The mean resilience of our sample was lower than the general population (mean 80.4 ± 12.5 , $N = 458$, and $p < 0.001$) [5] and similar to a previous sample of medical and surgical interns (mean 76 ± 11 , $N = 241$, and $p = 0.07$) [8]. Trainees with high resilience were more likely to report never having stress interfere with their relationships outside of work as compared to trainees with low resilience (high, 40%, versus low, 0%, $p < 0.001$) (Table 2). High resilience residents were more likely to report having the skills to manage stress and burnout (high, 80%, versus low, 45.8%, $p = 0.02$) and less likely to report feeling inferior to peers (high, 20.0%, versus low, 70.8%, $p < 0.001$) (Table 2). There was a trend towards

TABLE 2: Association of survey measures with high and low resilience^a.

Survey measure	Number of low resilience residents (%) (<i>n</i> = 24)	Number of high resilience residents (%) (<i>n</i> = 20)	<i>p</i> value
Having the skills necessary to manage stress and burnout	11 (46)	16 (80)	0.02
Stress makes resident feel inferior to peers	17 (71)	4 (20)	<0.001
Never or rarely feeling burnout	4 (17)	8 (40)	0.08
Stress never interferes with relationships outside of work	0 (0)	8 (40)	<0.001
Direct involvement in medical errors	5 (21)	3 (15)	0.62
Never reported a directly involved medical error	16 (67)	11 (55)	0.43

^aResilience was measured using the Connor-Davidson resilience scale. Low resilience was defined as a score <70 and high resilience as a score of 80–100.

more trainees with high resilience reporting less burnout (feeling burnout rarely or never) (high: 40.0%; intermediate: 27%; low: 16.7%, $p = 0.08$).

The majority of trainees (74%) reported direct involvement in medical errors and witnessing medical errors (97%). However, the majority of residents never reported errors they were involved in (61%) or witnessed (70%) (Table 1). Medical errors and reporting were not associated with resilience level (Table 2).

4. Discussion

In this multi-institutional regional sample of IM residents, there was a wide range of resilience scores. Resilience was lower than the general population and similar to a previous sample of medical and surgical interns [5, 8]. Thus our findings are concordant with the one previous study examining resident resilience, demonstrating that residents have lower resilience than the general population. These findings further highlight the problem of resident burnout and the need to augment resilience training in residents.

In addition, a significant fraction of residents, approximately one-third, demonstrated low resilience. Low resilience was associated with more stress interfering with relationships, feeling inferior to peers, and fewer skills to manage stress and burnout. These residents with low resilience may be a group that requires extra attention and intervention. Many residents reported burnout but about half had received training on burnout during residency and 60% had an outlet to discuss stress and burnout in their program. Thus despite more attention being called to burnout in GME training, existing programs are likely still not sufficient. Although involvement in medical errors was prevalent, reporting of medical errors was rare and no association was seen between resilience and medical errors. However, since experience with medical errors was prevalent for all residents, helping residents learn how to cope after medical errors may still be an important part of resilience training and needs more investigation.

Our study has several limitations. Due to nonresponse to demographic questions, we cannot analyze associations between resilience and any demographic factors. We also cannot determine if certain institutions or community or academic programs were overrepresented which may have influenced our results and introduced bias. We did not ask

residents about their year of training which may affect our results. We also cannot determine if there was any selection bias introduced by using residents attending a regional conference; for example, these residents may be more organized or engaged and thus have different resilience and burnout levels compared to those not attending the conference. Our response rate was likely low since many residents were only present for a portion of the conference and participation was voluntary. External validity may be limited as only one region of Illinois was included in this study. However, residents from both academic and community residency programs were surveyed. The questions regarding stress, burnout, and medical errors were not validated; thus residents may have interpreted the questions differently than intended. Burnout was assessed by resident self-report and not by a validated scale. Our questions regarding stress did not specify if we were asking about the intensity or frequency of stress and may have been interpreted differently. Although we asked about burnout training, we did not ask about specific information about what type of training they received. We also piloted our survey questions with first-year residents, a subgroup of the sample, which may have affected our results. Although the CD-25 has been validated in the general population, it has not been validated with physicians, which may impact our results. The medical error data was based on self-report, which may introduce bias.

Larger studies of resilience with a more representative sample of residents from different specialties, regions, and types of programs are needed to characterize resident resilience and determine how it relates to burnout. Additionally, correlation of resilience to burnout using a validated measure of burnout, such as the Maslach Burnout Inventory, is needed. Based on our preliminary study, however, resilience in residents is likely lower than the general population and there is an important population of residents with lower resilience who may benefit from interventions focused on enhancing resilience. This highlights that resilience, in addition to burnout, is an area that needs more attention and cultivation in residents. Although one resilience intervention in family medicine was positive, few educational innovations to enhance or teach resilience to residents have been identified and are an important area for future curriculum development. Determining if these interventions can impact resilience or burnout will also be important.

5. Conclusion

Our initial data investigating resident resilience demonstrates that there is variance in resilience among residents and a significant number of residents possess low levels of resilience. Resilience in residents is lower than the general population. Certain aspects of stress and burnout may be associated with lower resilience. More outlets to address stress, burnout, and resilience are needed in residency programs.

Competing Interests

The authors report no external funding source for this study. The authors declare that they have no competing interests.

Authors' Contributions

All authors made substantial contribution to the conception and design of the study. Amber-Nicole Bird and Amber T. Pincavage drafted the manuscript. All authors have been involved in revising the manuscript critically for important intellectual content. All authors have read and approved the final manuscript.

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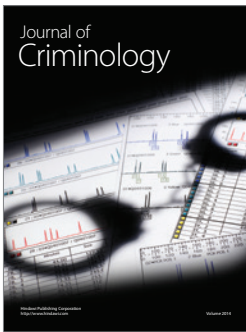
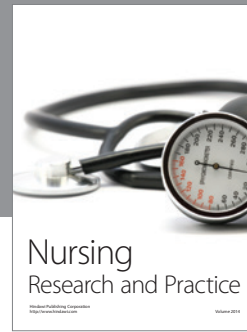
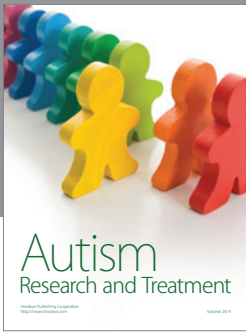
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