

# In Their Own Words: An Analysis of the Experiences of Medical Interns Participating in a Prospective Cohort Study of Depression

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## Abstract

### Purpose

To compare the subjective experiences of interns with and without symptoms of depression using a mixed-methods approach.

### Method

In 2007–2008, interns from six institutions were screened for depression before and during internship using an online survey that included the Patient Health Questionnaire (PHQ-9). At the end of internship, participants were asked what made the year difficult, easy, and memorable, and how they had changed. Computerized lexical and qualitative thematic analyses were performed to analyze their free-text responses.

### Results

Sixty-three percent (244/388) of invited interns participated in the original cohort study. Of those, 42% (103/244) answered the open-ended questions for this analysis. Thirty-five percent (36/103) screened positive for clinically significant depression (i.e., PHQ-9 score  $\geq 10$ ) during their intern year. Respondents with symptoms of depression were more likely to report problems with cynicism, exhaustion, and stress, while those without them were more likely to mention positive patient care and educational experiences. Respondents with symptoms of depression preferentially described experiences that “broke” their confidence, sense of well-being, and belief in the medical profession, while those who

did not described profoundly positive, life-changing experiences regarding interactions with patients and supportive colleagues, through which they grew personally and professionally.

### Conclusions

Depression during internship affects not only objective outcomes like medical errors but also how interns value the profession and themselves, with potentially profound consequences for their future career decisions. Residency programs should implement reactive interventions targeting depression and proactive interventions promoting resilience and well-being to address the issues that lead to depression.

*Editor's Note: A Commentary by S.J. Slavin and J.T. Chibnall appears on pages XXX–XXX.*

The recent tragic suicides of two interns in New York have brought renewed attention to the mental health of the nation's physicians-in-training.<sup>1</sup> The prevalence of depression is higher among medical trainees (29%) than among the general public (8%–15%).<sup>2,3</sup> Epidemiological studies have shown that long work hours, sleep deprivation, and loss of autonomy contribute to depression among residents.<sup>4</sup> Although

these studies have provided insights into how depression affects quantitative measures (e.g., medical errors),<sup>5</sup> the information available from such surveys is inherently limited, as they reduce residents' experiences to specific symptomatology predetermined by the researchers. Moreover, such surveys generally have focused on negative rather than positive psychological experiences. Alternative approaches are needed to identify novel factors that may contribute to or protect against depression among residents.

Here we present a qualitative analysis of the subjective experiences of interns with and without symptoms of depression as told in their own words. As part of the Intern Health Study, a prospective cohort study of depression among medical trainees, interns answered questions about their experiences.<sup>6</sup> We analyzed the open-ended questions, which allowed us to capture a wide range of emotional responses.<sup>7</sup> As a result, we were able to explore not only how depression colors the way interns see themselves, their profession, and their training environment but also how they

remain resilient and positive despite the high stress of internship, emerging from the year with renewed confidence and self-belief.

## Method

### Study participants and data collection

The Intern Health Study protocol was approved by the institutional review boards at the participating institutions.<sup>6</sup> Interns entering emergency medicine, internal medicine, general surgery, pediatrics, obstetrics–gynecology, and psychiatry residency programs from six institutions (three academic medical centers and three community hospitals, all in the Northeastern United States) during the 2007–2008 academic year were invited to join the study two months prior to internship. Surveys that allowed for both closed- and free-text responses were administered through a secure, confidential Web site. The baseline survey gathered demographic factors, psychological measures, self-reported history of depression, and baseline depressive symptoms using the Patient Health Questionnaire

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The authors have informed the journal that they agree that Douglas A. Mata and Marco A. Ramos have completed the intellectual and other work typical of the first author.

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(PHQ-9).<sup>8</sup> Respondents were contacted again at months 3, 6, 9, and 12 of their internship year and asked to complete the PHQ-9.

We considered respondents to have screened positive for depression during their intern year if they were (1) not depressed at baseline and (2) had a major depressive episode during the year, defined by a PHQ-9 score  $\geq 10$  on any quarterly questionnaire. A PHQ-9 cutoff of  $\geq 10$  has high sensitivity (88%; 95% confidence interval 74%–96%) and specificity (88%; 95% confidence interval 85%–90%) for diagnosing major depressive disorder and has been shown to be comparable to clinician-administered assessments.<sup>9,10</sup> Using a mixed-methods approach, we analyzed this evidence of depression with the free-text responses to the following open-ended questions, which were asked on the 12-month assessment only:

1. What factors made this year difficult for you?
2. What factors made this year easier for you?
3. What was your most memorable experience, good or bad, as an intern?
4. How do you feel the experience of internship has changed you?

We employed computerized lexical and iterative thematic techniques to analyze the free-text responses to these prompts among individuals who did or did not screen positive for depression. An important advantage of this mixed-methods approach was that we could consider a larger number of respondent perspectives than we could have with a purely quantitative or qualitative study. Furthermore, the qualitative method complemented our quantitative survey method in that it better elicited the thoughts and feelings of respondents.

**Computerized analyses**

Computerized lexical analysis characterizes the frequency of word usage in written texts for the extraction of themes and trends in an impartial manner.<sup>11</sup> We employed this method to analyze participants’ free-text responses, which we prepared by removing the noninformative linguistic features (i.e., capital letters, punctuation marks, numbers, and common English stop words) and by lemmatization (i.e., systematically grouping

together the different inflected forms of words so that they could be analyzed as single terms). We used WordStat 6.1.23 (Provalis Research, Montreal, Quebec, Canada) for these analyses. To determine the relevance of the words used by the respondents, we calculated frequency distributions using the text-mining package in R 3.0.0 (R Foundation for Statistical Computing, Vienna, Austria). To determine the degree to which words related to positive or negative emotions, we performed a linguistic-inquiry analysis using LIWClite7 1.02 (Pennebaker Conglomerates, Austin, Texas).

**Qualitative thematic analyses**

To complement the computerized analyses, two investigators (D.A.M., M.M.K.) independently categorized all free-text responses into qualitative themes using the constant comparative method.<sup>12</sup> These analyses were performed independently of the above-mentioned computerized analyses. The investigators then discussed each of the question responses, compared coding structures, reviewed theme exemplars, and reached consensus for differences. They summarized predominant themes with representative quotations.

**Statistical analyses**

Differences among continuous variables were assessed using the unpaired Mann–Whitney–Wilcoxon test. Differences among categorical variables were assessed using Pearson chi-square test with Yates continuity correction. All analyses were performed using the same R 3.0.0 software used for the computerized analyses described above.

**Results**

**Study participants**

Of the 388 interns invited to participate in the Intern Health Study, 244 (63%) chose to enroll. Of those, 103 (42%) responded to at least one of the open-ended questions and were included in this analysis (see Table 1). Individuals who responded to these questions did not statistically differ in age, specialty, marital status, history of depression, or development of depression during their intern year from those who did not respond to the open-ended questions. Respondents were slightly more likely to be female than nonrespondents (65% vs. 50%,  $P = .03$ ). Thirty-five percent (36/103) of respondents screened positive

**Table 1**  
**Baseline Demographic Data, Stratified by Positive vs. Negative Depression Screening, for 103 Respondents to a Survey About Internship, 2007–2008**

Characteristic	Depressed (n = 36)	Not depressed (n = 67)	P value
<b>Age, median (IQR)</b>	27 (27–30)	27 (26–29)	.29
<b>Gender, no. (%)</b>			.18
Male	9 (25.0)	27 (40.3)	
Female	27 (75.0)	40 (59.7)	
<b>Specialty, no. (%)</b>			.25
Emergency medicine	0 (0.0)	5 (7.5)	
Internal medicine	16 (44.4)	39 (58.2)	
Medicine–pediatrics	1 (2.8)	1 (1.5)	
Obstetrics–gynecology	4 (11.1)	6 (9.0)	
Pediatrics	6 (16.7)	7 (10.4)	
Psychiatry	6 (16.7)	4 (6.0)	
General surgery	3 (8.3)	5 (7.5)	
<b>Marital status, no. (%)</b>			.98
Divorced	1 (2.8)	1 (1.5)	
Engaged	3 (8.3)	6 (9.0)	
Married	13 (36.1)	24 (35.8)	
Single	19 (52.8)	36 (53.7)	
<b>History of depression, no. (%)</b>			.03
No	13 (36.1)	41 (61.2)	
Yes	23 (63.9)	26 (38.8)	

for clinically significant depression (i.e., PHQ-9  $\geq 10$ ) during their intern year. The longitudinal trajectory of depression over time among respondents mirrored that which we previously reported for the entire Intern Health Study cohort: Depressive symptoms increased markedly once the intern year began and stayed high throughout the year, and the incidence of screening positive did not significantly vary throughout the year.<sup>6</sup>

### Computerized and qualitative thematic analyses

**What factors made this year difficult for you?** The lexical analysis revealed that the most commonly used phrases reflected issues involving time (e.g., “long work hours” and “lack of sleep”). The next most frequently cited factors were “unsupportive colleagues,” the inability to fulfill “family obligations,” and

difficult or sick “patients.” Respondents with symptoms of depression were six times more likely to mention “stress” and almost twice as likely to cite difficulties with “lack of sleep,” “lack of time,” “attendings,” “family,” or “patients.” The linguistic-inquiry analysis revealed that respondents with symptoms of depression were more likely to use words related to negative emotions ( $P = .03$ ), anxiety ( $P < .01$ ), and sadness ( $P < .01$ ) (see Table 2). The investigators’ thematic analysis confirmed the results of the computerized analyses (see Figure 1). Respondents who screened positive for depression were more than twice as likely to cite being anxious, exhausted, overworked, stressed, or having no work–life balance. They were also one and a half times more likely to cite problems with a malignant program culture and bureaucracy at

work. Of interest, only 1% (1/103) of all respondents specifically cited “being depressed,” despite the fact that 35% (36/103) screened positive for depression.

**What factors made this year easier for you?** When asked what made the year easier, the most commonly used phrases involved social support (e.g., “spouses,” “families,” and “friends”). Those with and without symptoms of depression did not differ in their expression of words relating to positive emotions ( $P = .20$ ), negative emotions ( $P = .86$ ), anxiety ( $P = .66$ ), or sadness ( $P = .18$ ) (see Table 2). The investigators’ thematic analysis confirmed the importance of social support (see Figure 1). Of interest, less than 5% (4/97) of interns cited exercising, engaging in self-care, or receiving mental health care as factors making the year easier.

Table 2

**Results of a Linguistic-Inquiry Analysis, Stratified by Positive vs. Negative Depression Screening, for 103 Respondents to a Survey About Internship, 2007–2008<sup>a</sup>**

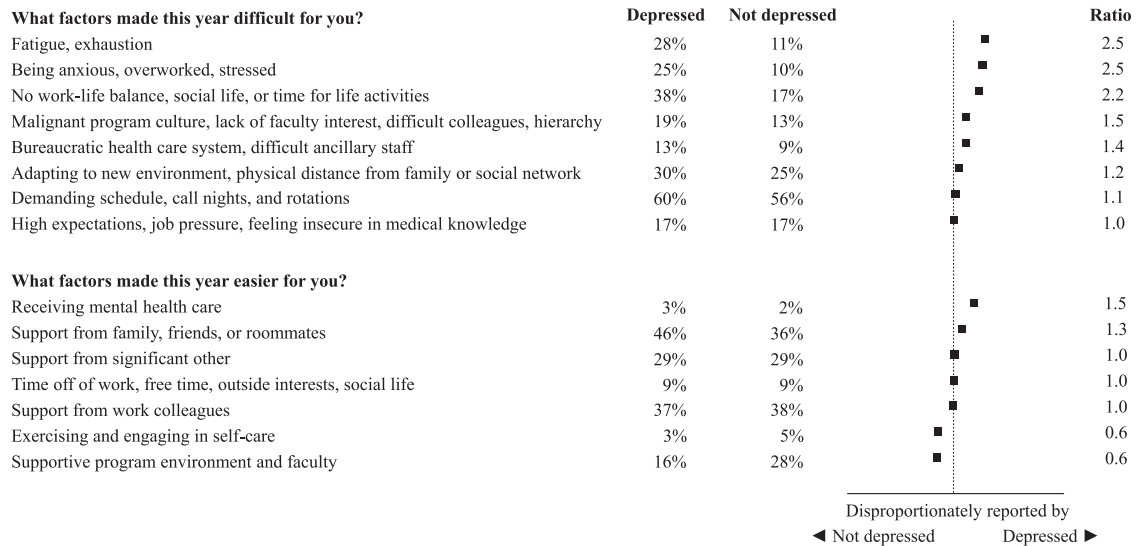
Survey question	Depressed, mean (SD)	Not depressed, mean (SD)	P value
<b>What factors made this year difficult for you?</b>			
Positive emotion	2.1 (3.3)	1.3 (3.2)	.10
Negative emotion	5.4 (6.7)	3.2 (5.8)	.03
Anxiety	2.0 (4.4)	0.5 (2.6)	< .01
Anger	0.2 (1.0)	0.5 (2.0)	.68
Sadness	2.7 (5.2)	0.8 (4.3)	< .01
<b>What factors made this year easier for you?</b>			
Positive emotion	12.0 (14.8)	15.4 (14.9)	.20
Negative emotion	0.6 (2.0)	0.5 (2.1)	.86
Anxiety	0.2 (1.3)	0.1 (0.6)	.66
Anger	0.0 (0.0)	0.0 (0.0)	—
Sadness	0.3 (1.5)	0.0 (0.0)	.18
<b>What was your most memorable experience, good or bad, as an intern?</b>			
Positive emotion	2.4 (4.1)	4.3 (7.1)	.32
Negative emotion	4.7 (10.3)	1.6 (2.7)	.21
Anxiety	0.7 (2.5)	0.2 (1.0)	.24
Anger	0.6 (1.8)	0.3 (1.2)	.60
Sadness	0.9 (3.9)	0.4 (1.5)	.67
<b>How do you feel the experience of internship has changed you?</b>			
Positive emotion	5.1 (6.0)	7.0 (8.1)	.46
Negative emotion	3.0 (4.6)	3.3 (6.7)	.40
Anxiety	0.9 (2.1)	0.7 (2.0)	.22
Anger	0.5 (1.7)	0.5 (1.9)	.84
Sadness	0.5 (1.3)	0.3 (1.2)	.04

<sup>a</sup>Reported values represent the percentage of total words written in response to each question.

### What was your most memorable experience, good or bad, as an intern?

The lexical analysis showed that the most memorable experiences for all respondents involved “patients and their families,” “deaths of patients,” other “residents and attendings,” the events of “call nights,” and “learning” new skills. Those with symptoms of depression used fewer positive and more negative emotional words, though these differences were not significant (see Table 2). According to the investigators’ thematic analysis, 49% (38/78), 22% (17/78), and 41% (32/78) of respondents shared at least one memory that was positive, neutral, or negative, respectively (the percentages do not sum to 100% because some reported more than one memorable experience). Fifty-seven percent (24/42) of memories about patients were positive, 26% (11/42) were neutral, and 17% (7/42) were negative. Twenty-four percent (10/42) involved caring for patients who later died. (The denominator [42] refers to the number of memories involving patients, rather than the number of respondents.) Respondents who screened positive for depression were three times more likely to mention a memory of a medical error and less than half as likely to recall a memory involving learning or receiving recognition for their work (see Figure 2).

**How do you feel the experience of internship has changed you?** The lexical analysis revealed that many respondents described how they



**Figure 1** Themes expressed by interns describing the factors that made their internship year difficult or easier, stratified by whether or not they screened positive for depression during the study. Investigators used the constant comparative method to derive and agree on the reported themes. Values represent the percentage of respondents who mentioned each theme. Results are displayed in descending order by the ratio of depressed to nondepressed interns’ responses.

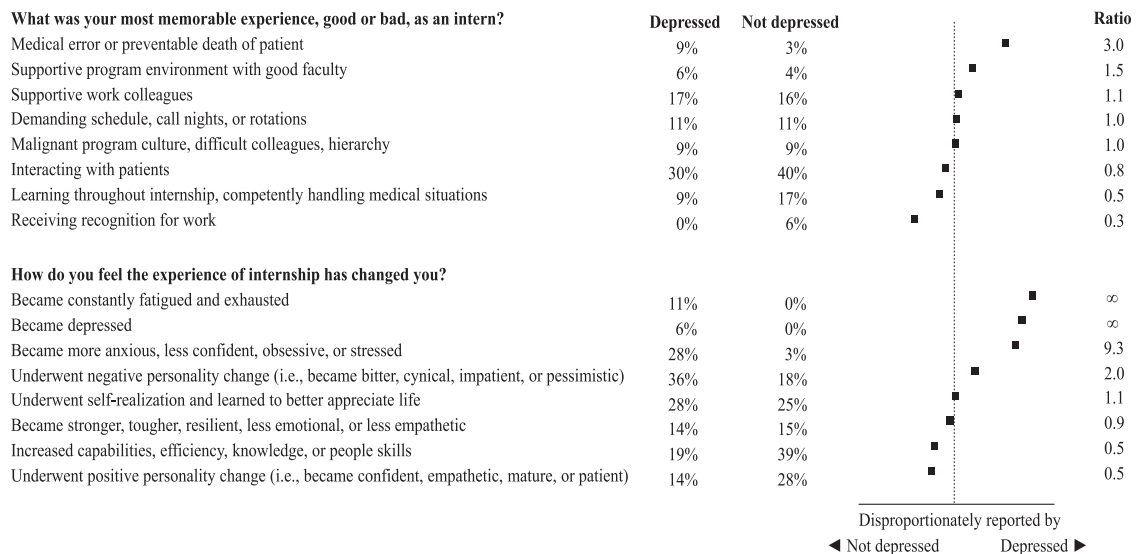
had gained “confidence” through “learning.” However, a subset stated that they had become “cynical,” “jaded,” or “pessimistic.” Respondents with symptoms of depression were more than six times more likely to use terms related to “exhaustion.” Those without symptoms of depression were between four and five times more likely to mention their “patients” and to state that they had “learned” or become “efficient.” They were between two and three times more likely to use words

like “competent,” “confident,” “enjoyed,” “friends,” “good,” and “responsible.” Respondents with symptoms of depression used more words related to sadness than did their nondepressed counterparts ( $P = .03$ ). According to the investigators’ thematic analysis, 72% (64/89) of respondents made at least one positive comment, and 39% (35/89) made at least one negative comment. Individuals with symptoms of depression were nine times more likely to mention anxiety, lack of confidence,

or stress and twice as likely to report undergoing a negative personality change (see Figure 2). They were half as likely to mention undergoing a positive personality change or increasing their knowledge and skills.

**Representative quotations**

**Respondents with symptoms of depression.** A key theme among responses was that depression negatively affected how interns valued the medical profession. Several respondents who



**Figure 2** Themes expressed by interns describing their most memorable experiences and how they had changed during internship, stratified by whether or not they screened positive for depression during the study. Investigators used the constant comparative method to derive and agree on the reported themes. Values represent the percentage of respondents who mentioned each theme. Results are displayed in descending order by the ratio of depressed to nondepressed interns’ responses.

screened positive for depression stated that they would not recommend a medical career to their peers. Many went so far as to reevaluate or regret their decision to become physicians:

I am more unsure about my career now than I was when I started and am not certain I want to be a doctor anymore, which is really sad since I have worked so incredibly hard towards this goal.

Doubt, regret, and negative perceptions of the medical field were linked to “cynicism” and feeling “jaded.” One intern wrote:

I am more cynical now, and I often have to remind myself of why I ever wanted to be a doctor.

Others associated negative judgments of the medical profession with the sense that they had “lost” themselves as individuals:

I have never doubted my decision to go into medicine as much as I do now. I am not a better person. I am more one-dimensional than ever before. I am less me.

Respondents with symptoms of depression also frequently cited a lack of time with patients, bureaucracy, and “paperwork” as among the major difficulties associated with their internship year:

Whether it was a difficult case medically or emotionally, there were a lot of frustrations involved in providing good patient care: roadblocks, paperwork, and bureaucracy.

**Respondents without symptoms of depression.** Although some respondents with symptoms of depression characterized the internship year negatively, we found that, for many others, it represented a deeply positive, life-changing experience. For example, one intern stated:

I actually expected to be more scarred by this experience than I have been. Most of the ways in which I have changed have been for the better. I am now more competent, more efficient, more knowledgeable, and more confident in my role as a physician.

A sense of social support emerged as a prominent theme in the responses of interns who characterized the year positively. One wrote:

I have an amazing support network of people who stand by me through thick and thin—both medical and nonmedical. I do not know what I would have done without them.

Contact with patients also emerged as a theme that respondents without symptoms of depression associated with feelings of positivity. Patient interactions were among the most commonly cited memorable experiences. One intern wrote that his most memorable experience was

Getting a gift from a patient’s family, and having a patient tell the attending that I was a good guy and took really good care of them.

## Discussion

Our study explored responses to open-ended questions that characterized the experiences of physicians with and without symptoms of depression during their internship year. Our analyses revealed how depression negatively affects the manner in which interns see themselves, their profession, and their training environment. As a result, we suggest resilience-based strategies for promoting enthusiasm and learning during residency.

### Devaluation of the medical profession

The responses of interns who screened positive for depression revealed that they found their internship year more stressful and had a more negative view of the medical profession than those who did not screen positive for depression. These findings underscore the importance of mental health during the internship year, as these negative experiences may have a profound impact on physicians’ sense of self and future practice, patient care, and career decisions. From an educational perspective, physicians should emerge from their internship year feeling capable, confident, and enthusiastic about their careers in medicine. Regret and cynicism during internship—a critical time in the development of the physician—may manifest later as burnout, a problem that disproportionately affects physicians compared with other workers in the United States.<sup>13</sup> Physicians who lose their enthusiasm for medicine in their first year as professionals, particularly during periods of depression, may carry it as a framing experience throughout their careers.

### Positive experiences during internship

Our thematic analysis of the responses of interns who did not screen positive for depression identified key positive

factors associated with the internship year. Although internship was still considered a stressful experience, interns without symptoms of depression gained self-confidence and competency as new physicians. Fostering this sort of resilience is a key goal of graduate medical education.<sup>14,15</sup> Our results suggest that measures to prevent depressive episodes in interns and to cultivate the training experiences described as positive and valuable by interns without symptoms of depression may improve the personal and professional growth of young physicians.

Future research and initiatives addressing the mental health and wellness of interns should focus not only on factors that combat the development of anxiety and depression but also on factors that foster resilience.<sup>15</sup> Given the high stress of internship, it is important to determine how interns maintain positive and resilient attitudes, emerging from the year with renewed confidence and self-belief. For example, rewarding experiences with patients may help interns remain resilient. However, interns today spend the preponderance of their time performing clinical computer work (40%), with only 12% of their time spent at the bedside.<sup>16</sup> Although prior research has investigated the educational impact of diminished patient contact, future investigations should determine whether this distribution of work also takes an emotional toll on residents.

Strong social support is well established as a factor that combats depression.<sup>17</sup> Interns cited a lack of support, particularly from fellow residents and attending physicians, as one of the major challenges of the year. Future research should examine whether a subjective sense of social support protects against the development of depression during internship. The implementation of mental health and wellness interventions at the residency program level, such as formalized peer support groups, may help foster the sense of social support that interns need to cope with the stress of training.

### Resilience training in residency

Implementing a resilience-based approach to preventing depression should focus on and reinforce the positive factors that promote intern well-being, such as developing support structures involving colleagues and program

leaders and emphasizing educational and rewarding contact with patients. Sood and colleagues<sup>18</sup> have demonstrated that brief interventions that teach resilience strategies to physicians are both feasible and effective in reducing anxiety and stress and in improving overall quality of life. Although further research is needed to determine the extent to which these findings might be applicable to interns, prior research has shown that physicians who are taught how to manage and promote their own mental health tend to more readily promote such strategies among their patients.<sup>19</sup>

Because resilience-promoting interventions target all interns, not only those in psychological distress, such training challenges the hidden curriculum that remains a barrier to physicians accessing mental health services during residency.<sup>20</sup> A significant percentage of interns exhibiting symptoms of depression (43%) believe that accessing mental health services would cause their colleagues to have less confidence in them.<sup>21</sup> Although efforts to change the culture in medicine through education are important, a resilience-based approach to intern mental health could help to shift the perceived role of psychiatric services away from the screening and treatment of “sick” individuals to the promotion of positive mental health among all trainees.<sup>22</sup> Furthermore, several resilience training programs, including the Penn Resilience Program and “hardiness” interventions, as well as neurobiological research, have suggested that resilience training may be effective in both the prevention and treatment of depression.<sup>23–26</sup>

Many respondents to our survey also mentioned issues related to time. Outside of resilience-based interventions that focus on the trainees themselves, residency programs also should consider structural interventions, such as implementing a more flexible practice schedule for trainees. The Mayo Clinic Physician Well-Being Program, for example, has demonstrated that modifications to the workplace, especially around time, can increase physician well-being.<sup>27</sup> However, such structural interventions may not be a panacea. Studies of the 2011 duty hours reforms have demonstrated that working less may not decrease depressive symptoms, increase the number of hours slept, or improve well-being.<sup>28</sup> Residency programs should focus

on supporting individuals directly as well as on improving the workplace to maximize the benefits to trainees’ mental health.

### Limitations

Our study has important limitations. First, depression was assessed via self-report rather than through structured diagnostic interviews. We employed this method because the accurate assessment of the symptoms of depression among medical trainees requires anonymity.<sup>29</sup> However, we used the PHQ-9, which has a diagnostic validity comparable to that of clinician-administered assessments.<sup>9</sup> Second, only 42% (103/244) of participants in the Intern Health Study responded to at least one of the open-ended questions. Although there was only a modest difference in gender between respondents and nonrespondents, our results should be extrapolated with caution. Our study was also limited to interns, and our findings should not be extended to more advanced physicians. Third, changes in duty hours guidelines and the larger health care environment that have occurred since 2008 may affect how today’s interns experience their first year of training. Last, further longitudinal studies of depression and internship are needed to determine the causality of our results.

### Conclusions

Depression among interns is more than a constellation of symptoms. It is a lived experience that negatively affects how interns value themselves and their profession. Destigmatization of mental illness among medical trainees and making screening and treatment for depression more accessible are important steps to addressing this issue. Proactive, resilience-based strategies also may help interns retain the enthusiasm that brought them to the medical profession in the first place so that they may emerge from training as capable, confident, and forward-looking practitioners.

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