

## Stress in Medical Residency: Status Quo after a Decade of Reform?

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**Background:** Although curricular reforms have attempted to address sources of stress in medical residency, no recent studies have examined the financial or emotional situations of current medicine residents.

**Objective:** To question medicine residents about financial status, educational debt, moonlighting, and psychological issues.

**Design:** Survey distributed in a nonrandomized fashion to medicine residents.

**Setting:** All 415 U.S. medicine residency programs.

**Results:** According to the questionnaire responses submitted by the 4128 (18%) participating residents, a substantial number of residents had financial and emotional distress that could have interfered with training. The reported educational debt was at least \$50 000 for 1657 (42%) of the respondents and at least \$100 000 for 737 (19%). The monthly disposable income was \$100 or less for 1620 (43%) of the residents, and 637 residents (16%) could not afford safe housing. Among respondents in their 2nd through 5th year of postgraduate training, 2187 (52%) had insufficient funds to purchase books and equipment, and 678 (29%) could not afford the required fees for the American Board

of Internal Medicine certifying examination; 2659 (33%) worked as moonlighters, and this percentage increased progressively with increasing educational debt.

Four or five depressive symptoms during residency were reported by 1461 (35%) residents. Eight hundred ninety-nine residents (23%) thought they had become less humanistic over the course of their residency training; 2347 (61%) reported becoming more cynical. Female residents were more likely than male residents to report increased cynicism and multiple depressive symptoms. Increased cynicism and depressive symptoms were associated with increasing educational debt.

**Conclusions:** Despite recent curricular reforms, an alarming number of current medicine residents report depressive symptoms, increasing cynicism, and decreasing humanism, which were associated with increasing educational debt and a need to moonlight for financial survival. Ongoing curricular reform, legislative relief from early loan repayment, and salary increases may be necessary to address these problems.

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During the 1970s and 1980s, medical educators attempted to examine the quality of the personal and professional lives of residents. Several small nonrandomized studies found a higher incidence of depression (1-4) and anger and hostility (5, 6) in residents than in the general population. These findings were partly attributed to chronic sleep deprivation and fatigue (7-11). In response, residency program directors suggested (12) and implemented procedures to identify, manage, and reduce resident stress and impairment. Although residents may still be overworked (13), duty hours are now carefully regulated, and program directors are required to regularly monitor resident stress (14). Currently, the American Board of Internal Medicine and others (15) emphasize the importance of fostering outstanding professional and humanistic characteristics in residents. Some researchers have suggested a link between long work hours and loss of professionalism among residents (13, 16).

New sources of stress to residents continue to emerge. These include increasing personal debt from medical school (17-20), unstable financial conditions in

many academic medical centers, threats of residency closings (21), and decreased confidence in the availability of jobs upon completion of residency (22-24). Furthermore, an increasing effort is required to master a rapidly expanding scientific and clinical knowledge base. Patients are sicker and are discharged faster on inpatient services, and many residents continue to be overworked, despite regulations (25). Worse yet, the residents' role models and teachers often openly express discontent with the practice of medicine (26).

### METHODS

To re-examine current residents' psychological and financial situations, the Resident Services Committee of the Association of Program Directors in Internal Medicine (APDIM) mailed a survey in May 1998 to all 415 internal medicine program directors, who were asked to distribute copies to each of their medicine residents (residents in categorical, preliminary, and combined tracks). Strict confidentiality was assured, and no specific names of residents or programs were included in the question-

**Table 1. Comparison of Demographic Data of Responding Residents with 1997–1998 Figures for U.S. Internal Medicine Residents\***

Characteristic	Residents Completing the Current Survey	U.S. Internal Medicine Residents†
	n (%)	
Sex		
Female	1794 (39.8)	8745 (37.5)
Male	2719 (60.2)	14 478 (62.5)
Year of residency training		
PGY 1	1444 (35.4)	8903 (38.2)
PGY 2	1283 (31.4)	7018 (30.1)
PGY 3	1237 (30.2)	6662 (28.6)
PGY 4	114 (2.8)	711 (3.1)
PGY 5	6 (0.15)	13 (0.06)

\* PGY = postgraduate year.

† Data on U.S. internal medicine residents obtained from the Graduate Medical Education Database, 1997, American Medical Association, Chicago, Illinois. This cohort included residents in medicine-pediatrics and medicine-emergency medicine training programs.

naire. Residents were questioned about demographic data, moonlighting activities, and finances, including monthly disposable income, student loan debt, and credit card debt. They were also asked whether they had experienced any or all of five depressive symptoms and whether they felt that they had become more or less cynical and more or less humanistic during residency training. Data on all respondents were included in the analysis, with missing data noted.

## RESULTS

### Demographic Data and Response Rate

We received responses from 4128 (18%) of the medicine residents in the United States in 1998 (Table 1). The decision to maintain confidentiality made follow-up of nonrespondents impossible, and it is unknown how many residents received but did not com-

plete the survey. In addition, the survey design precludes interpretation of these results as representative of all residents. Just as it is unlikely that we achieved a statistically accurate sampling of the resident population, it is also doubtful that all residents with serious personal difficulties responded. These factors prevent us from determining the true proportion of residents with financial or emotional distress.

### Financial Data

Table 2 shows the financial data of responding residents. Among the 3961 residents who indicated their estimated educational debt, the average amount was \$44 412 and the median was \$25 000; 1657 residents (42% of responders) reported owing at least \$50 000 in educational debt. The average estimated credit card debt was \$3769; 1224 residents (31%) reported having at least \$3000 in credit card debt, and 320 (8%) reported at least \$15 000. From postgraduate year (PGY) 1 to PGY 4, the mean credit card debt increased from \$3275 to \$6194. One thousand six hundred twenty responding residents (43%) had a monthly disposable income—defined as income remaining after payment of required bills of food, rent, utilities, and debt—of \$100 or less, including many with a negative monthly disposable income.

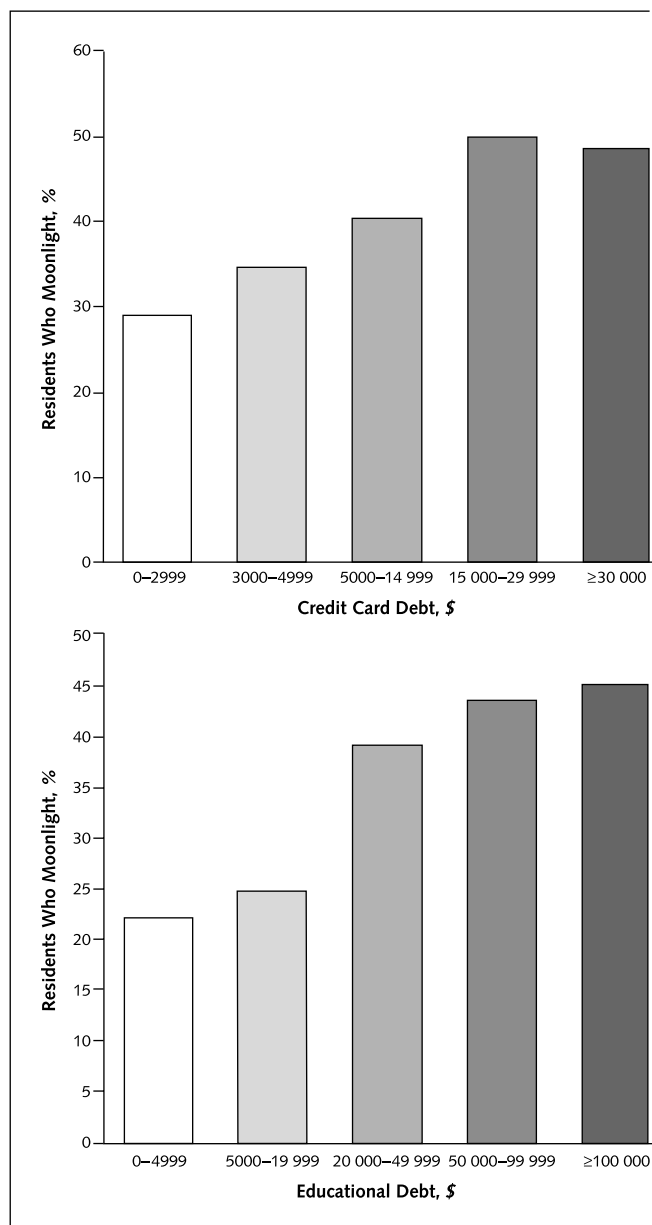
Two thousand one hundred eighty-seven residents (52%) reported having insufficient funds to purchase work items, such as books and equipment. Six hundred seventy-eight (30%) PGY-2 through PGY-5 residents could not afford the fee for the American Board of Internal Medicine certifying examination, and, most disturbingly, 637 responding residents (16%) could not afford safe and sufficient housing. Only 10%, however,

**Table 2. Financial Data on Responding Residents**

Estimated Educational Debt		Estimated Credit Card Debt		Monthly Disposable Income*	
Amount	Residents	Amount	Residents	Amount	Residents
\$	n (%)	\$	n (%)	\$	n (%)
0–4999	1692 (42.7)	0–2999	2756 (69.2)	0–100	1620 (43.1)
5000–19 999	182 (4.6)	3000–4999	220 (5.5)	101–200	549 (14.6)
20 000–49 999	430 (10.9)	6000–14 999	234 (5.9)	201–500	1041 (27.7)
50 000–99 999	920 (23.2)	15 000–29 999	234 (5.9)	≥501	550 (14.6)
≥100 000	737 (18.6)	≥30 000	86 (2.2)		

\* Monthly disposable income was defined as income left over after payment of required bills of food, rent, utilities, and debt.

**Figure 1. Relationship of credit card and educational debt to moonlighting.**



said that salary was a consideration in choosing a specialty.

**Moonlighting**

Of 2629 responding PGY-2 through PGY-5 residents, 857 (33%) had moonlighting jobs. Among the moonlighters, 167 (20%) worked 21 to 30 moonlight-

ing hours per week, 101 (12%) worked 31 to 40 moonlighting hours per week, and 81 (9%) worked more than 40 moonlighting hours per week. Among those who completed the survey, moonlighting progressively increased with increasing educational and credit card debt (Figure 1). Fifty-four percent of moonlighting respondents had at least \$50 000 in educational debt compared with 34% of nonmoonlighters. Similarly, 35% of moonlighters had at least \$5000 of credit card debt compared with 22% of nonmoonlighters. Moonlighters were more likely to have sufficient money for books and equipment but were no more likely to be able to afford the board examination. Moonlighters and nonmoonlighters did not differ significantly in the amount of end-of-month disposable income (\$292.60 vs. \$294.36).

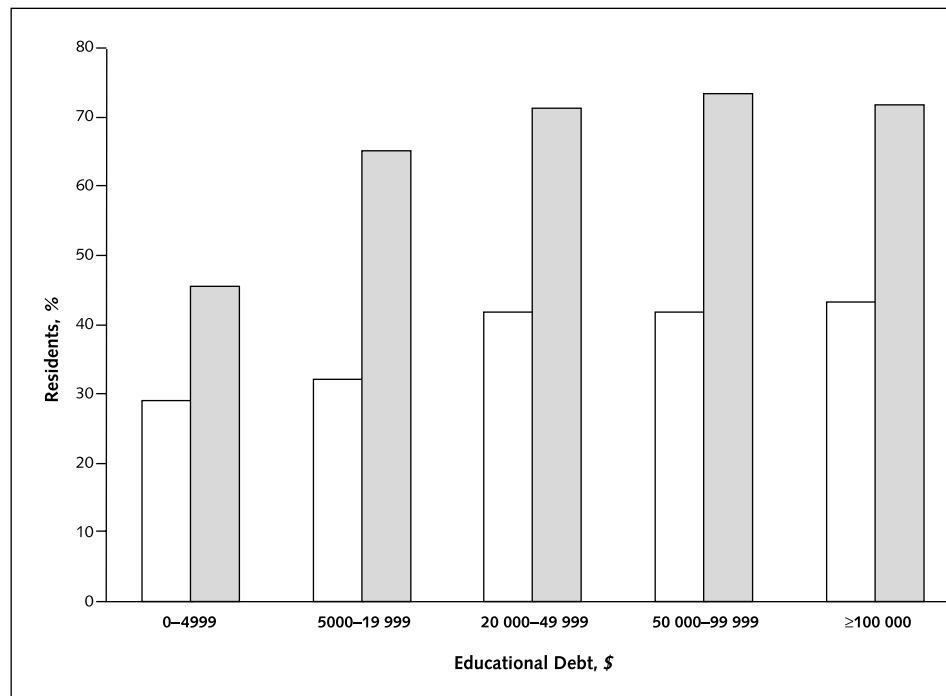
**Depressive Symptoms, Cynicism, and Humanism**

A substantial number of residents reported depressive symptoms since starting residency. Forty-nine percent had experienced appetite changes; 61%, mood swings; 52%, decreased recreational activities; 45%, depressed mood; and 74%, sleep disturbance. Four or five depressive symptoms were reported by 1461 residents (35% of respondents), and 991 (22%) reported all five symptoms. Seventeen percent reported a loss of a loved one or close friend during residency. Eight hundred ninety-nine responding residents (23%) reported becoming less humanistic during residency training, and 2347 (61%) reported becoming more cynical. Importantly, among survey respondents, increasing debt correlated with self-reports of increasing cynicism and multiple depressive symptoms (Figure 2).

**Responses of Female Residents**

Forty percent of responding female residents ( $n = 667$ ) and 32% of responding male residents ( $n = 777$ ) noted four or five depressive symptoms. Sixty-seven percent of responding female residents ( $n = 1033$ ) reported increasing cynicism versus 56% of responding male residents ( $n = 1294$ ). Eighty-five percent ( $n = 1342$ ) of female respondents believed that residency increased the complications of pregnancy. Twenty-eight percent of responding female residents ( $n = 328$ ) felt faculty pressure to delay pregnancy, and 52% ( $n = 533$ ) said that peers were resentful about pregnancy and maternity leave.

Figure 2. Relationship of educational debt to depressive symptoms and increased cynicism in physician residents.



White bars = residents with four or five depressive symptoms; gray bars = residents with increased cynicism.

Residents with children less often reported feelings of depression than residents without children (41% vs. 47%). Similarly, residents with children less often reported increased cynicism (50% vs. 65%) and more often reported increased humanistic feelings (27% vs. 23%).

## DISCUSSION

Our survey indicates that despite extensive efforts to reduce stress during residency, many medical residents had financial and emotional distress that could have interfered with training. Although our study is, to our knowledge, the largest to have examined these issues in this population, it is unlikely that the responses represent a statistically accurate sampling. However, even if we assume that only discontented, maladjusted, or financially distressed residents returned the survey, the absolute number of internal medicine residents reporting significant problems must serve as a serious alert to all concerned with our medical educational system and demands remediation.

In 1996, Reynolds (27) reported an average debt of \$39 707 in internal medicine residents, which is similar

to our figure of \$44 412. The average debt in our study is lower than the 1997 mean medical student debt of \$80 462 reported by the Association of American Medical Colleges (19, 28). A possible explanation for the reduced amount may be that residents with lower debt, such as those who graduated from publicly supported institutions, are overrepresented among our survey respondents (28). Furthermore, a disproportionately greater percentage of the residents working in internal medicine training programs are international medical graduates, most of whom have no educational debt (29). Although studies have shown that increasing debt only weakly affects specialty choice (30–32), very high debt (33, 34) may reduce the likelihood that a medical student will choose a career in primary care.

In our survey, residents with debt more often turned to moonlighting as an extra source of income. Moonlighting did not generate increased disposable income, and thus, the extra income from moonlighting was probably being used to pay for debt services and fixed monthly expenses. The rate of moonlighting among respondents is similar to rates in several previous

nonrandomized studies (23% to 40%) (35–42). Moreover, similar to earlier studies, educational debt in our study correlated with increased moonlighting. Of great concern is that 349 (40.7%) moonlighting respondents worked more than 20 hours per week at their moonlighting jobs. The substantial time spent moonlighting, combined with an average 80-hour work week of most residents, could result in undue fatigue and potentially jeopardize resident education and patient care.

Other studies (27, 30) have noted that debt repayment markedly decreases satisfaction with personal lifestyle during residency by limiting time for leisure activities. Although we did not specifically ask about lifestyle, 43% of respondents had less than \$100 of monthly disposable income, which is clearly insufficient to support substantial leisure activities. Undoubtedly, many residents must borrow money, perhaps from family members, to cover their most basic needs and to pay for unexpected expenses, additional professional costs, or personal entertainment.

Emotional distress in residents—especially depression—has been well documented (1–4, 6). After conducting structured psychiatric interviews, Valko and Clayton (1) concluded that 30% of the residents they interviewed had significant depression during internship. Using the Center for Epidemiologic Studies scale, Reuben (2) demonstrated that 28.7% of the medical interns tested were depressed, and Ford (6) found that 33% of interns rated themselves as depressed. Our finding that approximately 35% of respondents noted four of five depressive symptoms is similar, and is higher than the estimates for the adult U.S. population, which has a lifetime risk of 7% to 25% and a point prevalence of approximately 5% (43, 44).

Despite the efforts of most training programs to improve professionalism in their graduates, more than half of the responding residents reported increasing cynicism, and 25% reported decreasing humanism during residency. Increasing cynicism has also been seen in medical students (45) and may be related to increasing anger during residency (5).

Our study also suggests that the unique mental health needs of many female medicine residents are not being met. More female respondents reported depressive symptoms and increased cynicism than their male counterparts. In addition, large numbers of female residents expressed concerns about the possibility of future preg-

nancy, an added stress from faculty and peers. The increased stress of pregnancy during residency, concerns about the pregnancy experience, and increased hostility from male peers have been well documented (49–57). Female residents' concern about increased medical complications of pregnancy during residency has been noted previously, despite evidence that, except for increased preterm labor, the outcomes of pregnancy are not greatly affected by residency training (58–64). However, one recent study from Israel (65) showed an increased incidence of stillbirths, and a 1988 study (66) showed a trend toward increased pregnancy-induced hypertension. Thus, although the preponderance of evidence is reassuring, some evidence supports the concern of female residents in our survey about the increased medical complications of pregnancy during residency training.

Our finding that parenthood reduced the stress of residency in some of the respondents is intriguing. How parenthood may blunt the negative effect of financial stress and may confer greater humanism and less cynicism needs further exploration. Perhaps being a young parent engenders hope in the future and a more altruistic view of life, or the family unit may act as a stabilizing force in the resident's life.

## RECOMMENDATIONS

Although the limitations of our study are clear, we have identified a significant number of residents with alarming financial and psychological distress. The large number of residents in whom increasing debt burden correlated with self-reports of depressive symptoms, increasing cynicism, and increasing need for moonlighting for financial survival is of great concern. Leaders in academic medicine must develop solutions to the significant negative impact of debt. Relief—in the form of tuition subsidies for medical education, increases in residents' salaries, full loan deferral of principal and interest without interest accrual during residency training, and improved financial advice for residents—are all pieces of a solution to this major problem. Of note, efforts to limit moonlighting through regulation should be undertaken with caution in the absence of concomitant measures to alleviate the financial distress of residents. Finally, program directors, medicine department chairs, and senior medical education leaders must become

aware of the additional stress in the lives of at least some of their female residents and develop systems in their programs for detection and prompt intervention.

Successful training of well-educated, humanistic physicians is a priority, and current stresses may thwart the accomplishment of that goal in some residents. We hope that this perspective paper will stimulate medical educators to further study the extent and causes of resident stress in both male and female residents in a randomized fashion. More important, our own results should mobilize the medical education community to respond immediately and effectively to the unmet needs expressed by many of the trainees under our care.

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