

Survey of job burnout and depression in standardized residency training programs in China

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Abstract

To evaluate job burnout and its impacts on mental health among clinical residents in a 3-year standardized residency training program in China.

This cross-sectional study was conducted among all residents in the Department of Internal Medicine of the Peking Union Medical College Hospital in August 2017. Job burnout and depressive symptoms were assessed using the Maslach Burnout Inventory-General Survey and the Center for Epidemiological Survey, Depression, respectively.

Among the 159 residents who completed the survey, comprising 69 who had graduated from 8-year medical schools and 90 from 5-year schools, the rate of job burnout was 62.2% (100/159) and the rate of depression was 28.3% (45/159). Rates of job burnout and depression in residents completed different years of training showed no significant difference. Rate of job burnout was significantly higher among graduates of 5-year medical schools (76.7%) than among those of 8-year schools (44.9%, $P < .001$). Pearson chi-squared test revealed a significant correlation between depression and job burnout ($P < .001$). Multiple logistic regression revealed a significant correlation between job burnout and attendance at 5- or 8-year medical schools ($P = .044$).

Job burnout may be more frequent among graduates from 5-year medical schools than among those from 8-year schools.

Abbreviations: CES-D = Center for Epidemiological Survey, Depression, MBI-GS = Maslach Burnout Inventory-General Survey, PUMCH = Peking Union Medical College Hospital.

Keywords: depression, job burnout, standardized residency training program

1. Introduction

Job burnout and depression are common emotional problems in modern society. Pathological depression refers to a state of depression and sullenness that are disproportionate to the situation and that, in severe cases, lead to suicidal behavior.^[1] Job burnout refers to when an individual fails to respond effectively to work-related stress and is associated with feelings of being quite tired of work, extra pressure, a sense of frustration and tension, lack of motivation, decreased enthusiasm, commitment to work, skepticism about the meaning and contribution of work, and negative self-evaluation.^[2] Studies from various countries

indicate that most healthcare workers show job burnout to different degrees. Some studies suggest that job burnout can strongly affect an individual's physical and mental health and therefore the quality of his or her work. More serious job burnout is associated with a higher degree of anxiety and depression, lower work efficiency and greater impact on work.^[3,4]

In the medical profession, job burnout and depression may also affect patient safety. In China, physicians and patients are in a tense relationship that continues to be strained by frequent policy changes and reforms. This tension complicates clinical work, scientific research and, teaching, and it may contribute to growing depression and job burnout among physicians. Newly employed residents may suffer particularly heavy pressure because of their long working hours and intense workload.^[5] In addition, the implementation of standardized residency training programs in China means that residents must engage in training, assessments and other activities in addition to clinical work. In teaching hospitals, residents also engage in clinical teaching and scientific research. Not surprisingly, residents often work overtime, a trend compounded by their low work efficiency due to inexperience and low patient trust.

Since its establishment in 1921, Peking Union Medical College Hospital (PUMCH) has followed the "John Hopkins model", and it eventually developed an integrated residency training program in which residents perform rotations in all internal medicine specialties rather than training directly in 1 specialization. In 2014, China introduced a policy to integrate the training of clinical postgraduates with standardized residency training programs, such that the Department of Internal Medicine at PUMCH trains postgraduates not only from 8-year medical schools like Peking Union Medical College but also from 5-year medical schools all over the country.

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Here we surveyed residents rotating in the Department of Internal Medicine at PUMCH on job burnout and depression, so that we can learn more about the current working situation of those residents in PUMCH and could potentially predict the working situation of residents from hospitals in China and other countries with similar health care environment. The results highlight the need for greater attention to the mental health of residents.

2. Methods

2.1. Subjects

The PUMCH residency program cycle begins and ends in September. All 159 residents in postgraduate years 1 to 3 in the Department of Internal Medicine were surveyed in August 2017 using an anonymous questionnaire that was distributed and collected by trained staff. All questionnaires were recovered and used in the analysis (100% response rate). Authors had no access to information that could identify individual participants. This study was approved by the Ethics Committee of the Peking Union Hospital.

2.2. Data collection and assessment

The questionnaire collected demographic information about each subject, including gender (male or female), age, postgraduate year (1–3), duration of medical school (5 or 8 years), and relationship status (single or with life partner). Burnout was investigated using the Maslach Burnout Inventory-General Survey (MBI-GS),^[6] which has been widely used for the investigation of job burnout in clinical residents all over the world. Our study used the revised Chinese version of this survey, which was developed in 2002 with the permission of the developer of the original survey. This Chinese version has shown good reliability and validity.^[7] The survey features 16 questions along three dimensions: emotional exhaustion (5 questions), cynicism (5 questions) and reduced personal accomplishment (6 questions). Subjects respond to each question using a 7-point Likert scale (0, “never”; 6, “very frequent”). An average score of 3 on each question is regarded as intermediate burnout; average scores below 3 indicate milder burnout, average scores of 3 to 5 indicate relatively serious burnout, and scores above 5 indicate very serious burnout. Reverse scoring was applied to the questions related to reduced personal accomplishment. A subject was classified as potentially having a burnout if there was at least 1 dimension in which the average score of each question was equal to or greater than 3 points.

Depressive symptoms were assessed using the Center for Epidemiological Survey, Depression (CES-D) Scale.^[8] This survey involves 20 items regarding work performance during the preceding week. Subjects respond on a 4-point scale (0, <1 day; 1, 1–2 days; 2, 3–4 days; 3, 5–7 days). These responses are added together to obtain an overall score. Scores ≤ 15 indicate no depressive symptoms; 15 to 20, possible depressive symptoms; and >20 , definite depressive symptoms. For the present study, subjects scoring >15 points were defined as having depressive symptoms.

2.3. Statistical analysis

Results were analyzed statistically using SPSS 19.0. Standard descriptive statistics were reported, and univariate analyses were conducted using Fisher exact test or the Wilcoxon/two-sample *t* test. Differences in responses on the three dimensions of

the MBI-GS between demographic groups were assessed for significance using the Kruskal–Wallis test. Pearson chi-squared test was used for correlation analysis. Multiple logistic regression was carried out to examine whether job burnout correlated with other factors. Differences associated with $P < .05$ were considered statistically significant.

3. Results

3.1. General characteristics of residents

At the end of August 2017, 159 residents were working in the Department of Internal Medicine at PUMCH, including 53 in postgraduate year 1, 51 in year 2, and 55 in year 3. The male to female ratio was 37:122, and the average age was 27.3 ± 6.2 years. Of the total, 69 had graduated from 8-year medical schools and 90 from 5-year medical schools (Table 1). Questionnaires from all 159 residents were analyzed in this study.

3.2. Job burnout

Average scores across all 159 residents were 16.09 ± 7.51 for emotional exhaustion, 13.22 ± 5.83 for cynicism and 16.09 ± 5.47 for reduced personal accomplishment. A total of 100 subjects (62.2%) received an average score of ≥ 3 for all questions on at least 1 dimension of the MBI-GS, and these were classified as potentially having burnout. They comprised 32 in postgraduate year 1, 34 in year 2 and 34 in year 3. Of the 69 residents who graduated from 8-year medical schools, 31 (44.9%) were classified with potential burnout, compared to 69 of the 90 residents (76.7%) who graduated from 5-year schools ($P < .001$).

Of these 100 residents, 48 received average scores of at least 3 on 2 dimensions, while 16 received average scores of at least 3 on all 3 dimensions. Scores on reduced personal accomplishment were significantly lower among residents in postgraduate year 2 than among residents of other years ($P = .018$), but the three cohorts did not differ significantly in emotional exhaustion or cynicism. Job burnout was more obvious across the 3 dimensions in the case of residents who had graduated from 5-year medical schools than among residents from 8-year schools, and differences were significant for cynicism and reduced personal accomplishment ($P < .001$). Significant differences were not observed across the 3 dimensions between men and women, or between those who reported being single or in a relationship (Table 2).

3.3. Depressive symptoms

A total of 45 residents (28.3%) scored >15 on the CES-D scale, indicating that they may have depressive symptoms. In fact, most of these (32, 71.1%) scored >20 , suggesting more obvious depressive symptoms. The 45 residents comprised 10 in

Table 1
Medical school duration of survey respondents.

	Postgraduate year		
	1	2	3
Graduated from 8-year medical school	17	23	29
Graduated from 5-year medical school	36	28	26
Total	53	51	55

Values are n.

Table 2**Comparison of 3 dimensions of job burnout among internal medicine residents stratified by postgraduate year, gender, and relationship status.**

Stratification	Subgroup	Dimension of burnout		
		Emotional exhaustion	Cynicism	Reduced personal accomplishment
Postgraduate year	Year 1 (n=53)	15.96±6.75	13.32±5.37	15.53±5.64
	Year 2 (n=51)	15.73±8.02	13.27±6.27	12.51±5.51
	Year 3 (n=55)	16.53±7.82	13.07±5.92	14.09±4.95
	<i>P</i>	.853	.973	.018
Medical school duration	8-year (n=69)	14.65±6.44	11.62±4.95	12.87±3.97
	5-year (n=90)	17.27±8.06	14.73±5.94	15.90±5.64
	<i>P</i>	.054	<.001	<.001
Gender	Male (n=37)	14.83±7.31	11.66±4.78	12.97±5.43
	Female (n=122)	16.55±7.55	13.66±6.03	14.37±5.47
	<i>P</i>	.265	.072	.182
Relationship status	Single (n=82)	16.06±6.99	13.56±5.47	14.67±5.38
	With life partner (n=77)	15.96±8.03	12.71±6.11	13.32±5.54
	<i>P</i>	.951	.652	.104

Values are mean±SD unless otherwise indicated.

Table 3**Analysis of factors potentially related to depression and job burnout.**

		Depressive symptoms			Job burnout		
		Yes (n=45)	No (n=114)	<i>P</i>	Yes (n=100)	No (n=59)	<i>P</i>
Gender	Male (n=37)	2 (5.4)	35 (94.6)	.001	17 (48.6)	18 (51.4)	.047
	Female (n=122)	43 (35.8)	79 (64.8)		83 (66.9)	41 (33.1)	
Relationship status	Single (n=82)	25 (30.5)	57 (69.5)	.623	53 (64.6)	29 (35.4)	.731
	With life partner (n=77)	20 (26.0)	57 (74.0)		47 (61.0)	30 (39.0)	
Postgraduate year	Year 1 (n=53)	10 (18.9)	43 (81.1)	.069	32 (60.4)	21 (39.6)	.786
	Year 2 (n=51)	20 (39.2)	31 (60.8)		34 (66.7)	17 (33.3)	
	Year 3 (n=55)	15 (27.3)	40 (72.7)		34 (61.8)	21 (38.2)	
Medical school duration	8-year (n=69)	16 (23.2)	53 (76.8)	.173	31 (44.9)	38 (55.1)	<.001
	5-year (n=90)	29 (32.2)	61 (67.8)		69 (76.7)	21 (23.3)	

Values are n (%).

postgraduate year 1, 20 in year 2 and 15 in year 3, and analysis of variance suggested similar incidence of depressive symptoms among the three cohorts (Table 2).

3.4. Factors related to job burnout and depression

Incidence of job burnout and depressive symptoms were compared between subgroups of respondents stratified based on gender, relationship status, 5- or 8-year medical school, and postgraduate year (Table 3). Women were more likely than men to have depressive symptoms ($P=.001$) and job burnout ($P=.047$). Graduates of 5-year medical schools were significantly more likely to have depression or job burnout than graduates of 8-year schools ($P<.001$).

3.5. Multiple regression to identify factors related to job burnout

A total of 41 residents were identified who simultaneously had probable depressive symptoms and job burnout. The presence of depressive symptoms was significantly associated with emotional exhaustion and cynicism ($P<.001$), but not with reduced personal accomplishment (Table 4). Multiple logistic regression identified job burnout as being significantly associated with the presence of depressive symptoms ($P<.001$; Fig. 1) and with graduation from a 5-year medical school ($P=.044$; Table 5).

4. Discussion

A systematic review of studies published between 1963 and 2015 examining depression among clinical residents found that 21% to 44% had depression or related symptoms.^[1] A review of studies published between 1990 and 2015 on job burnout among medical students and residents found incidence of burnout to be up to 50% to 70% and to be significantly higher than in the general population and higher even than among other types of healthcare workers.^[9,10] Despite the prevalence of these problems, few studies have examined their causes or possible interventions to reduce them.^[11] The Department of Internal Medicine at PUMCH has a long-standing integrated clinical residency training program with a high completion rate, yet a previous questionnaire study of almost 60% of our residents indicated chronic challenges, such as tense

Table 4**Multi-factor analysis to identify variables related to job burnout.**

Factor	<i>P</i>	Odds ratio	95% confidence interval	
			Upper	Lower
Gender	.803	1.117	0.468	2.670
Relationship status	.881	1.063	0.481	2.348
Postgraduate year	.676	1.227	0.469	3.212
Medical school duration	.044	2.850	1.378	5.529
Depressive symptoms	<.001	10.685	3.293	34.673

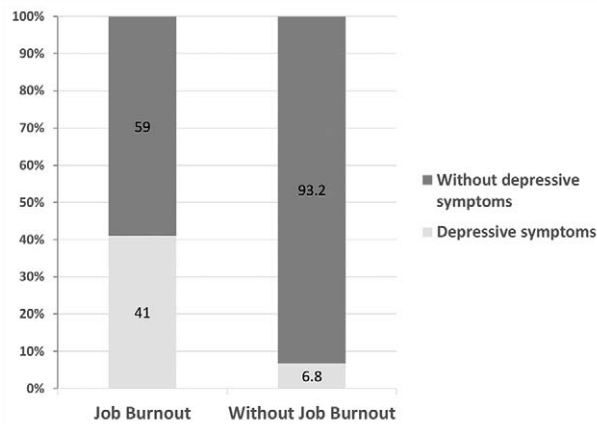


Figure 1. Correlation of the presence of depression and job burnout in all residents.

relationships between physicians and patients, sometimes resulting in violence; long work hours, leading to physical and mental fatigue; difficulties balancing work and family life; and other sources of stress, including economic pressure, pressure due to various exams within the residency program, promotion, and competition for job positions.^[12] The present study found that 29% of residents across all three postgraduate years had depressive symptoms, while 62% had job burnout. These results, which are consistent with recent work in other countries, provide the first quantitative insights into depression and job burnout among residents in standardized residency programs in China.

Various assessment scales have been developed to measure job burnout, and the 1 used in more than 90% of job burnout studies is the MBI.^[8] Emotional exhaustion is the most representative indicator of job burnout, while cynicism is the interpersonal relationship dimension of job burnout, and reduced personal accomplishment is the self-evaluation dimension of job burnout. Some researchers have suggested that job burnout is a slow developmental process: it can initially manifest as stress lasting a long time, then the individual gradually becomes emotionally tired and begins to alter his or her attitudes towards work and others, ultimately leading to job burnout.^[2,13] Physicians are often under chronic stress, which helps explain why job burnout is more common in healthcare than in other sectors, making burnout prevention and treatment important.^[14,15] Professional staff should be responsible for detecting symptoms of burnout and depression as early as possible, and they should try to prevent them from happening. Since our results found no significant difference in the incidence of depression or burnout with postgraduate year, we recommend that interventions (such as courses) be organized from the beginning of the medical residency, and even during medical school.

Previous studies identified several factors associated with job burnout, including higher education level, participation in decision-making, heavy workload, and time pressure.^[2,4,10,13] Those studies further found that men tended to show greater cynicism, while women tended to show greater emotional exhaustion. In the present study, we found that incidence of burnout was higher among residents from 5-year medical schools than among those from 8-year schools: this difference was observed across all 3 dimensions of emotional exhaustion, cynicism, and reduced personal accomplishment, with the difference significant in the latter 2 cases. Gender, income, and other factors also influenced the presence of depression and job burnout to varying degrees, which is generally consistent with the results of other studies. However, gender did not influence the 3 dimensions of job burnout. This negative result may reflect the small proportion of males in our internal medicine residency training program, and the fact that our study was conducted at a single center with a small sample. Multiple logistic regression identified 5- or 8-year medical school and the presence of depressive symptoms as significantly related to job burnout. Medical education varies widely across China, and 1 major difference is program duration. These differences can give rise to different quality of medical graduates with different levels of psychological resilience and professionalism. We found that depression was significantly related to job burnout, specifically to emotional exhaustion and cynicism. This is consistent with a review of 18 epidemiological studies of job burnout and depression that suggested that they are different stages of the same process.^[16] That review further suggested, in slight contrast to our results, that depression is strongly related to the emotional exhaustion of job burnout, but weakly related to cynicism and reduced personal accomplishment. The potential relationships between job burnout and depression should be explored in further work.

The severe situation of depression and job burnout among clinical residents argues for effective prevention and intervention strategies, since physical and mental illness can affect patient safety as well as attrition among residents.^[3] Training courses can be introduced in professionalism, the meaningfulness of work, physician-patient communication skills, and physician-nurse communication skills. Such courses can strengthen the ability of residents to adapt and cope with stress, treat their self-care as an important part of professionalism and balance work and family life. Residents should be encouraged to adopt a healthy diet and to exercise; working efficiency should be improved and systems for mentoring and team collaboration should be introduced. Several studies have associated working hours with depression and job burnout. It may be advisable to limit continuous working hours and focus more on residents' psychological health, in line with trends in medical residency training in the US.^[15,17-20] For example, the Accreditation Council for Graduate Medical Education has reduced the upper

Table 5

Comparison of 3 dimensions of job burnout between residents with or without depressive symptoms.

Dimension	Depressive symptoms (n = 45)	Without depressive symptoms (n = 114)	F	P
Emotional exhaustion and Cynicism	21.58 ± 6.44	13.91 ± 6.77	42.472	<.001
Reduced personal accomplishment	17.84 ± 5.23	11.39 ± 4.99	52.428	<.001
	15.09 ± 3.99	13.66 ± 5.92	2.224	.138

Values are mean ± SD.

limit on continuous working time and restricted duty frequency, and they recommend psychological counseling courses as part of residency programs.^[21,22]

Surprisingly little attention has been paid in the literature to the physical and mental health of residents,^[23–26] and such work is particularly important in China, where standardized residency training programs are still in relatively early phases of development and spread.

Further work should examine residents' working hours and workload to create a better working environment, and medical faculty should be trained to identify early symptoms of depression and job burnout, such as long-term stress and emotional tension. Adequate counseling services should be readily available to residents.

One of the challenges in the present study is ensuring honest responses, especially since depression or depressive symptoms are associated with social stigma. To reduce response bias, respondents were assured that their surveys would remain completely anonymous. The staff issuing the questionnaire was carefully trained to guarantee such anonymity. The results are reliable for residents in our department within PUMCH, but the question remains whether they are representative of the 190,000 residents in standardized training programs in China since 2014. PUMCH is a medical center for rare, severe, difficult, and complicated diseases, so bias may not be ignored and the conditions of job burnout in PUMCH may not be consistent with that in the other hospitals. Large, multi-center studies are needed to validate and extend our findings.

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