

Job stress and satisfaction in southwest Chinese hospitals

A cross-sectional study

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Abstract

This paper discusses the job characteristics, satisfaction, and stress levels experienced by clinical neurologists in Guizhou Province, China.

A questionnaire survey was conducted associated with the 2021 Annual Meeting of Neurology in Guizhou province. After obtaining ethical approval to conduct the study, the target group was asked to complete an anonymous online survey that included sociodemographic data, followed by questions related to job stress and satisfaction as well as future aspirations.

Four hundred sixty people participated in the study, including 179 (38.9%) men and 281 (61.1%) women. About 407 (88.5%) felt stress in their job. Three hundred and seventeen (68.9%) experienced depression, 307 (66.7%) experienced anxiety, and 273 (59.3%) had some degree of sleep disturbance. Three hundred fifty-three (76.7%) were disappointed with their wages, 239 (52.0%) were bored with their jobs, and 353 (76.7%) considered their jobs to be somewhat dangerous. Interestingly, 250 (54.3%) would consider becoming doctors again, but 354 (77.0%) preferred their child not to become doctors. While 338 (73.5%) said they were proud to be a neurologist, only 123 (26.7%) indicated they were optimistic concerning doctor-patient relationships.

Neurologists have significant emotional factors associated with their careers, which are more likely to lead to job burnout and decreased job satisfaction. Attention should be paid to these stresses to improve the retention and job satisfaction of neurologists.

Abbreviations: CI = confidence intervals, GPs = general practitioners, SD = standard deviation, WHO = World Health Organization.

Keywords: China, job satisfaction, job stress, neurologists

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1. Introduction

According to the latest data from the World Health Organization (WHO), ischemic heart disease and stroke are the first and second leading causes of death worldwide and responsible for approximately 16% and 11% of total deaths, respectively.^[1] Thus, neurologists are experiencing significant increases in work stress and dissatisfaction.^[2,3] Several studies have reported that work-related burnout is common in physicians, including a range of specialties such as surgery, oncology, intensive care physicians, psychiatrists, anesthesiologists, dentists, and radiologists.^[4–14] However, few surveys have included the prevalence of job burnout experienced specifically by neurologists.^[3,15] One national survey of 7288 US physicians revealed that neurology is the only medical specialty that has one of the worst work-life balances and one of the highest job burnout rates. Zhou et al reported that approximately 53.2% of responding neurologists experienced some degree of job burnout, 37.8% had psychological morbidity, 50.7% developed high job stress levels, 25.7% experienced low levels of job satisfaction, 76.9% had poor doctor-patient relationships, and 58.1% regretted becoming a doctor.^[3] Based on this previous data, we investigated the incidence of job stress and satisfaction among neurologists in the Guizhou region of China.

2. Methods

We surveyed neurologists who attended the 2021 Annual Meeting of Neurology in Guizhou province from the 24th to the 26th of March that focused on job satisfaction and stress to

determine the incidence of these experiences as well as associated factors. The anonymous questionnaire was designed to collect and analyze the following information:

1. demographic characteristics and hospital information,
2. underlying health conditions,
3. the levels of job stress and satisfaction as assessed using the modified Health Consultant's Job Stress and Satisfaction questionnaire (HCJSSQ-modified 1994 version), and
4. the quality of physician–patient relationships.

All participation was voluntary. The resulting data were de-identified before analysis. If the participants chose to complete the survey, they could receive a small gift. Ethics approval for the study was granted by the ethics committee of Guizhou Medical University.

2.1. Statistical analysis

The IBM Statistical Package for Social Science (SPSS version 19.0) was used for the analyses. All data were analyzed for descriptive statistics (mean, median, standard deviation, and frequency) and examined for assumptions of normality and linearity. Missing data responses were analyzed, and, when necessary, responses were weighted to adjust for data missing at random. Associations between all variables were examined using Spearman and Pearson correlations where appropriate and chi-square tests of independence. Depending on assumptions of normality, linear, logistic, ordinal, or multinomial regression were used. All tests of statistical hypotheses used an alpha level of .05 and reported 95% confidence intervals (95% CI).

3. Results

3.1. Personal characteristics of respondents

Four hundred sixty neurologists responded to the survey. Nearly all of the physicians were working in the Guizhou Province of China. Table 1 summarizes the number of responses to the survey questions that asked about demographic characteristics, including age, sex, nationality, professional title, degree, hospital, salary, work hours, on-call times, marital status, and the number of children. The number of responses could have been fewer than the total number of participants who responded to the survey because respondents were not required to answer all the questions if they so desired. As seen in Table 1, fewer than half of the physicians were males ($n=179$, 38.9%), and more than half of the neurologists were females ($n=281$, 61.1%). The mean (standard deviation, SD) age was 33.6 (7.75) years (median, 32 years), and among these physicians, 242 (52.6%) were under the age of 35. Among the participants, 185 (40.2%) were ethnic minorities. Residents (35.2%) and attending (25.7%) neurologists accounted for a large proportion of the total respondents. Most neurologists had a bachelor's degree (65.2%), the majority were located in secondary and tertiary hospitals. Among the respondents, 156 (33.9%) had a monthly salary of less than 5000 yuan, 210 (45.7%) had a monthly salary of 5000 to 8000 yuan, and only 20 (4.3%) had a monthly salary above 12,000 yuan. We noted that 295 (64.1%) neurologists worked more than 56 h per week, and 216 (47.0%) were on-call an average of four to eight nights per month. Most of the physicians ($n=334$, 72.6%) were married and had one ($n=172$, 37.4%) or two children ($n=140$, 30.4%).

Table 1

Characteristics of the 460 participating neurologists.

Characteristics	n (%)
Age	
33.61 ± 7.75 ($\bar{x} \pm S$)	
<35	242 (52.6)
36–50	118 (25.7)
>51	13 (2.8)
Missing	87 (18.9)
Sex	
Male	179 (38.9)
Female	281 (61.1)
Nationality	
Han nationality	275 (59.8)
Minority	185 (40.2)
Title of technician	
Intern	72 (15.7)
Resident	162 (35.2)
Attending	118 (25.7)
Senior	81 (17.6)
Missing	27 (5.9)
Degree	
College	91 (19.8)
Bachelor	300 (65.2)
Master	57 (12.4)
Doctor	6 (1.3)
Missing	6 (1.3)
Hospital level	
Primary	4 (0.9)
Secondary	220 (47.8)
Tertiary	228 (49.6)
Other	6 (1.3)
Missing	2 (0.4)
Monthly salary, RMB	
<5000	156 (33.9)
5000–8000	210 (45.7)
8000–12000	74 (16.1)
>12000	20 (4.3)
Hours worked per week	
<48	43 (9.3)
48–56	121 (26.3)
>56	295 (64.1)
Missing	1 (0.2)
Times of nights on call per month	
<4	154 (33.5)
4–8	216 (47.0)
>8	81 (17.6)
Missing	9 (2%)
Marital status	
Married	334 (72.6)
Single	113 (24.6)
Have partner	8 (1.7)
Divorced or widowed	5 (1.1)
Have children	
0	145 (31.5)
1	172 (37.4)
2	140 (30.4)
>2	3 (0.7)

3.2. Health conditions of participating neurologists

Among the 460 participants, only 198 (43.0%) underwent a yearly physical examination. Of these participants, 317 (68.9%) experienced depression, 307 (66.7%) experienced anxiety, and 307 (66.7%) had experienced pleasure. We observed that 273 (59.3%) participants had some degree of sleep difficulty (Table 2).

Table 2
Health conditions of the 460 participating neurologists.

	n (%)
Physical examination per year	
Yes	198 (43.0)
No	262 (57.0)
Feeling depressed	
No	62 (13.5)
Fewer	78 (17.0)
Common	177 (38.5)
More	76 (16.5)
Constantly	64 (13.9)
Missing	3 (0.7)
Feeling anxious	
No	76 (16.5)
Fewer	73 (15.9)
Common	171 (37.2)
More	77 (16.7)
Constantly	59 (12.8)
Missing	4 (0.9)
Trouble in sleeping	
No	83 (18.0)
Fewer	101 (22.0)
Common	154 (33.5)
More	66 (14.3)
Constantly	53 (11.5)
Missing	3 (0.7)
Feeling delight	
No	42 (9.1)
Fewer	108 (23.5)
Common	193 (42.0)
More	84 (18.3)
Constantly	30 (6.5)
Missing	3 (0.7)

3.3. Overall job stress and satisfaction among neurologists

3.3.1. Job satisfaction. Indicators of job satisfaction included the respondents' overall ratings of how satisfied they were, perceptions of their career progress, their impression of future job prospects, and perceptions of their job achievements. Regarding overall job satisfaction, 27.6% (n=127) of the participants indicated that they were somewhat satisfied with their current job and 43.5% (n=200) indicated they were more satisfied (Table 3). The majority of the respondents also agreed (n=225, 48.9%) or strongly agreed (n=49, 10.7%) that they felt their work had made progress (Table 3). The results for job prospects were similar, with n=256 (55.7%) for the same and n=111 (24.1%) for better (Table 3). On the whole, the majority of the participants were satisfied with their job achievements (the same, n=176 (38.3%), more, n=141 (30.7%), and constantly, n=31 (6.6%), as shown in Table 3.

3.3.2. Job stress. Nearly all of the 460 respondents who indicated that they felt stress in their job expressed that they were feeling at least some stress (①commonly, n=166 (36.1%) ②more, n=189 (41.1%) and ③constantly, n=52 (11.3%) with a total of n=407 (88.5%).). Notably, many participants continued to work after going home (①commonly, n=173 (37.6%), ②more, n=59 (12.8%), and ③constantly, n=67 (14.6%), resulting in a total of n=299 (65.0%).). Two hundred ninety-five participants (64.1%) reported that they experienced time management conflicts. Of the 295 responses, 56 (12.2%) thought they did not have any spare time, and 212 (46.1%)

Table 3
Job satisfaction of the 460 participating neurologists.

	n (%)
Job satisfaction	
Dissatisfaction	40 (8.7)
Not quite satisfaction	45 (9.8)
Sometimes satisfaction	127 (27.6)
More satisfaction	200 (43.5)
Constantly satisfaction	45 (9.8)
Missing	3 (0.7)
Feeling progress of career	
No	72 (15.7)
Fewer	93 (20.2)
Common	225 (48.9)
More	49 (10.7)
Constantly	17 (3.7)
Missing	4 (0.9)
Feeling prospect of job	
Not good	27 (5.9)
Not so well	39 (8.5)
Common	256 (55.7)
Better	111 (24.1)
Very good	23 (5.0)
Missing	4 (0.9)
Feeling satisfaction of job achievements	
No	26 (5.7)
Fewer	82 (17.8)
Common	176 (38.3)
More	141 (30.7)
Constantly	31 (6.7)
Missing	4 (0.9)

reported they had little spare time. Also, "having objective adverse working conditions, including limited equipment or space, and could not finish the job" were rated highly by all participants (58.9%). More than half of neurologists (61.1%) reported that their job affected their family life. Even so, 266 (57.8%) continued to keep up with the latest neurology research.

At the same time, more than 50 percent of the responding neurologists (①commonly, n=140 (30.4%), ②more, n=91 (19.8%), and ③constantly, n=63 (13.7%), for a total n=294 (63.9%)) were required to be involved in management. It was widely acknowledged in the survey that the participants considered their skills were underutilized (①commonly, n=200 (43.5%), ②more, n=59 (12.8%), and ③constantly, n=25 (5.4%), totaling n=284 (61.7%)). Seventy-six point seven percent of the participants were disappointed with their pay (①commonly, n=161 (5.0%), ②more, n=76 (16.5%), and ③constantly, n=116 (25.2%) for a total n=353 (76.7%)). Finally, more than 50% indicated that they experienced burnout with their jobs, and 77% considered their jobs to be somewhat dangerous. All the contents are shown in Table 4.

3.3.3. Neurologists look to the future. Of the total neurologists participating in the survey, 250 (54.3%) indicated they would be willing to become doctors again, but only 22.2% wanted their child to become doctors. Interestingly, despite those who indicated they did not want to become doctors again and did not want their children to become doctors, there were still 338 (73.5%) people who were proud to be a neurologist. However, sadly, only 123 (26.7%) were optimistic about their doctor-patient relationships (Table 5).

Table 4
Job stress of the 460 participating neurologists.

	n (%)
Job stress	
No	19 (4.1)
Fewer	31 (6.7)
Common	166 (36.1)
More	189 (41.1)
Constantly	52 (11.3)
Missing	3 (0.7)
Still work after going home	
No	78 (17.0)
Fewer	81 (17.6)
Common	173 (37.6)
More	59 (12.8)
Constantly	67 (14.6)
Missing	2 (0.4)
Time management conflict	
No	74 (16.1)
Fewer	88 (19.1)
Common	153 (33.3)
More	76 (16.5)
Constantly	66 (14.3)
Missing	3 (0.7)
Having spare time	
No	56 (12.2)
Fewer	212 (46.1)
Common	169 (36.7)
More	17 (3.7)
Constantly	5 (1.1)
Missing	1 (0.2)
Having objective condition to finish job	
No	74 (16.1)
Fewer	113 (24.6)
Common	152 (33.0)
More	72 (15.7)
Constantly	47 (10.2)
Missing	2 (0.4)
Affecting family life	
No	80 (17.4)
Fewer	97 (21.1)
Common	183 (39.8)
More	54 (11.7)
Constantly	44 (9.6)
Missing	2 (0.4)
Keeping latest research	
No	81 (17.6)
Fewer	111 (24.1)
Common	159 (34.6)
More	74 (16.1)
Constantly	33 (7.2)
Missing	2 (0.4)
Participating management	
No	66 (14.3)
Fewer	97 (21.1)
Common	140 (30.4)
More	91 (19.8)
Constantly	63 (13.7)
Missing	3 (0.7)
Optimized skills in job	
No	76 (16.5)
Fewer	97 (21.1)
Common	200 (43.5)
More	59 (12.8)
Constantly	25 (5.4)

(continued)

Table 4
(continued).

	n (%)
Missing	3 (0.7)
Disappointed about the salary	
No	46 (10.0)
Fewer	58 (12.6)
Common	161 (35.0)
More	76 (16.5)
Constantly	116 (25.2)
Missing	3 (0.7)
Feeling tired of job	
No	156 (33.9)
Fewer	62 (13.5)
Common	195 (42.4)
More	24 (5.2)
Constantly	20 (4.3)
Missing	3 (0.7)
Job dangerous	
No	17 (3.7)
Fewer	86 (18.7)
Common	207 (45.0)
More	75 (16.3)
Constantly	71 (15.4)
Missing	4 (0.9)

4. Discussion

The Chinese economy has experienced rapid growth in the past three decades. At the same time, the Chinese health care system has undergone tremendous changes to meet the needs of 19% of the world's population. However, medical resources, including human resources, are unevenly distributed, creating the potential for substantial work-related stress. The shortage of physicians is apparent in almost every specialty.^[5] At the same time, an estimated 23.2% (244.5 million) of the Chinese adult population 18 years and older have been reported to experience hypertension,^[16] approximately 11% of the population has diabetes,^[17] and the approximate prevalence of dyslipidemia was 35.8%.^[18] Based on the number of stroke patients in China,^[19] the inadequate number of neurologists is a severe problem. In addition, the increasing number of high-risk stroke patients adds to the job pressure experienced by neurologists.

There have been numerous reports describing job stress, job satisfaction, job “burnout,” and suicide rates among physicians in China as well as globally.^[5,11,12,20,27] Job stress and burnout among physicians have been identified as significant public health concerns.^[24] Job burnout is an extreme form of occupational stress and is experienced, particularly by those working in the health professions. It was characterized by Maslach and Jackson (1981) as including emotional exhaustion, depersonalization, and feelings of reduced personal accomplishment. This classification was updated by the World Health Organization (2018) to include:

1. reduced energy or exhaustion;
2. increased mental distancing from one's job, or negative feelings or cynicism related to one's job; and
3. reduced professional efficacy.

The consequences of high stress and burnout include physiological responses such as headaches, musculoskeletal disorders, heart disease, and psychological responses such as

Table 5
Job expectations of the 460 participating neurologists.

	n (%)
To be a doctor again	
Yes	250 (54.3)
No	206 (44.8)
Missing	4 (0.9)
Want your child to be a doctor	
Yes	102 (22.2)
No	354 (77.0)
Missing	4 (0.9)
Are you proud of being a neurologist	
Yes	338 (73.5)
No	118 (25.7)
Missing	4 (0.9)
Attitudes towards doctor–patient relationship	
Hopelessness	70 (15.2)
Neutrality	263 (57.2)
Hopeful	123 (26.7)
Missing	4 (0.9)

anxiety and depression.^[2,5] Furthermore, job satisfaction includes receiving recognition of performing one's job well, having positive interpersonal interactions in the workplace, and receiving fair wages. The correlation between job satisfaction and performance is well documented, as are the adverse effects of stress on an individual's ability to carry out their job well.^[2,5] Clinician well-being is an essential component of health care and can be broadly defined as experiencing a sense of wellness (optimized physical and mental health), resiliency, and professional fulfillment.^[2,6] However, few relevant reports on job satisfaction have focused on neurologists.^[3,15] Therefore, it is essential to investigate job stress, burnout, and occupational well-being among neurologists. We designed a cross-sectional study that examined survey responses concerning job stress and satisfaction from 460 neurologists from all regions in Guizhou Province, located in southwest China.

Based on the data, we determined that most neurologists in Guizhou province who participated in the survey were younger women. They were less likely to have two or more children and more highly educated (bachelor's and master's degrees). In contrast, the income of this subset of participants was less. Men and women worked similar hours per week, and the numbers of nights on call were similar each month (Table 6). These results were comparable to the findings published by Zhou et al.^[3,13,15,21]

From this survey, we discovered that although the participants were health care workers and understand the overall importance of physical health, a majority of neurologists (57.0%) did not undergo yearly physical examinations. Compared with the physical examination items studied in Japan, which included the air conduction pure-tone audiometry, glycated hemoglobin levels, electrocardiogram assessment by a specialist, and others, most of our physicians had not completed the annual routine physical examination.^[22] Also, most of the participants experienced one or more periods of depression (68.9%), anxiety (66.7%), or sleep disturbances (59.3%). Interestingly, over 50% of the participants also reported happy experiences. Whether these favorable experiences were related to career satisfaction is worth further investigation (Table 2).

Reviewing their career, an overwhelming number of participants (80.9%) reported that they were more satisfied with their

Table 6
Sex and the ages of the 373* participating neurologists.

Age	Sex n (%)		P
	Male	Female	
$\chi \pm S$	37.14+8.22	31.35+6.51	.000 [‡]
<35	67 (18.0)	175 (46.9)	
36–50	68 (18.2)	50 (13.4)	
>51	11 (2.9)	2 (0.5)	
Title of technician			
Intern	9 (2.1)	63 (14.5)	.000 [‡]
Resident	60 (13.9)	102 (23.6)	
Attending	58 (13.4)	60 (13.9)	
Senior	51 (11.8)	30 (6.9)	
Degree			
College	16 (3.5)	75 (16.5)	.000 [‡]
Bachelor	143 (31.5)	157 (34.6)	
Master	15 (3.3)	42 (9.3)	
Doctor	3 (0.7)	3 (0.7)	
Monthly salary, RMB			
<5000	35 (7.6)	121 (26.3)	.000 [‡]
5000–8000	88 (19.1)	122 (26.5)	
8000–12000	42 (9.1)	32 (7.0)	
>12000	14 (3.0)	6 (1.3)	
Have children			
0	41 (9.0)	101 (22.0)	.001 [†]
1	64 (14.0)	108 (23.6)	
2	72 (15.8)	68 (14.9)	
>2	2 (0.4)	1 (0.2)	

* Since 87 neurologists had not completed the age submission, so the contents of the table is 373 participants.

[†] The ages of males and females were compared using the Student *t* test and analysis of variance. Other univariate analyses in the table were assessed with Chi-square tests (binary variables or unordered categorical variables).

[‡] Mann–Whitney *U* tests (ordinal category data) were used to assess associations between variables.

work, felt that their career had made progress, were hopeful for their work prospects, and indicated that their work provided a great sense of achievement. Zhou et al found that overall job satisfaction was most strongly associated with sensing a high level of job security, having variety in the job, deriving intellectual stimulation from teaching, and having opportunities for personal learning.^[3] In the future, we will design a professional questionnaire for job satisfaction to better examine the relationship between job satisfaction and work stress.

The results from this survey demonstrated that job stress was prevalent among the physicians. Most of the respondents (88.5%) indicated that they felt some or considerable job stress at least once, with 52.4% reporting that they felt a great deal of stress. These results were similar to those reported by Kelly et al.^[11] Another study found that over 50% of practicing physicians experienced burnout.^[28] Numerous factors contribute to burnout, including perceived loss of control, use of electronic medical records, and problems with work-life balance. Burnout is associated with many adverse consequences in the health of physicians as well as health care delivery. These consequences include reduced patient safety, medical errors, substandard patient care, decreased mental health of providers, and increased thoughts of quitting or changing jobs. It has been estimated that by 2032 there will be a shortage of 46,900 to 121,900 physicians, in part due to the effects of burnout.^[24,29] More than half of the participants indicated in this survey that they were currently dealing with work-related issues after going home, and the percentage of those reporting conflicts with work-time management was even higher (64.1%).

Due to the intense nature of their work, the majority of neurologists revealed that they have no (12.2%) or almost no (46.1%) spare time, for a total of 58.3%. The lack of spare time had some effect on their family life. Due to the lack of adequate numbers of medical management personnel, many participants indicated that they were required to be involved in medical quality management or medical care management.

In January 2018, the number of general practitioners (GPs) was 1.5 per 10,000 people in China, which was still far below the target for 2020 of 2 to 3 GPs per 10,000 people. The number of health care management professionals also did not increase proportionately with the expansion of services that are provided. In practice, these results produce an increased workload for existing healthcare workers.^[23] However, based on these published reports, it is unclear whether too many healthcare workers are involved in non-medical work. Nevertheless, 61.7% of physicians reported feeling that their skills were not being fully utilized. In addition, more than two-thirds of the doctors (76.7%) included in this study were dissatisfied with their monthly salary. More than 50 percent (51.9%) felt they were “tied” to their job, and a majority (76.7%) were not optimistic about dangers associated with their job (Table 4).

At the end of our survey, we asked the neurologists if they would consider becoming a doctor again. Despite their tiredness, disappointment with their salary, and other dissatisfactions, more than 50% of the participants (54.3%) indicated they would become doctors again and were proud to be a doctor (73.5%). These observations might be related to the intense satisfaction of the job. However, a majority did not want their child to become a doctor (77.0%). Finally, more people were hopeful about their doctor-patient relationships (Table 5).

5. Conclusion

This cross-sectional survey included nearly all neurologists practicing in the hospitals located in Guizhou province, and 460 questionnaires were collected. In summary, most physicians experienced some degree of physical disease as well as work pressure. However, most respondents indicated that they had some confidence in their future work and doctor-patient relationships. There were some notable differences between men and women concerning their educational background, salary levels, and marital status. We will continue to follow these neurologists in the future to carry out a dynamic observation process, such as a cohort study. Also, similar to the concept of stroke prevention, strategies should be developed to prevent job-related burnout or more dangerous conditions, including depression and suicide among neurologists.

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References

- <https://www.who.int/zh/news-room/fact-sheets/detail/the-top-10-causes-of-death>.
- Sigsbee B, Bernat JL. Physician burnout: a neurologic crisis. *Neurology* 2014;83:2302–6.
- Zhou X, Pu J, Zhong X, et al. China Neurologist Association. Burnout, psychological morbidity, job stress, and job satisfaction in Chinese neurologists. *Neurology* 2017;88:1727–35.
- Fukui S, Rollins AL, Salyers MP. Characteristics and job stressors associated with turnover and turnover intention among community mental health providers. *Psychiatr Serv* 2020;71:289–92.
- Li H, Zuo M, Gelb AW, et al. Chinese anesthesiologists have high burnout and low job satisfaction: a cross-sectional survey. *Anesth Analg* 2018;126:1004–12.
- Yehya A, Sankaranarayanan A, Alkhal A, et al. Job satisfaction and stress among healthcare workers in public hospitals in Qatar. *Arch Environ Occup Health* 2020;75:10–7.
- Guveli H, Anuk D, Ofiaz S, et al. Oncology staff: burnout, job satisfaction and coping with stress. *Psychooncology* 2015;24:926–31.
- Song KW, Kim HK. Job stress and its related factors among Korean dentists: an online survey study. *Int Dent J* 2019;69:436–44.
- Graham J, Ramirez AJ, Field S, Richards MA. Job stress and satisfaction among clinical radiologists. *Clin Radiol* 2000;55:182–5. discussion 186.
- Chichra A, Abhijnhan A, Tharyan P. Job stress and satisfaction in faculty of a teaching hospital in south India: a cross-sectional survey. *J Postgrad Med* 2019;65:201–6.
- Kelly M, Soles R, Garcia E, Kundu I. Job Stress, burnout, work-life balance, well-being, and job satisfaction among pathology residents and fellows. *Am J Clin Pathol* 2020;153:449–69.
- Malcolm N, Boyd L, Giblin-Scanlon L, Vineyard J. Occupational stressors of dental hygienists in the United States. *Work* 2020;65: 517–24.
- Garcia E, Kundu I, Kelly M, Soles R, Mulder L, Talmon GA. The American Society for Clinical Pathology’s job satisfaction, well-being, and burnout survey of Pathologists. *Am J Clin Pathol* 2020;153:435–48.
- van der Wal RA, Bucx MJ, Hendriks JC, Scheffer GJ, Prins JB. Work stress and satisfaction in relation to personality profiles in a sample of Dutch anaesthesiologists: a questionnaire survey. *Eur J Anaesthesiol* 2016;33:800–6.
- Pu J, Zhou X, Zhu D, et al. Gender differences in psychological morbidity, burnout, job stress and job satisfaction among Chinese neurologists: a national cross-sectional study. *Psychol Health Med* 2017;22:680–92.
- Wang Z, Chen Z, Zhang L, et al. China hypertension survey investigators. Status of hypertension in China: results from the China hypertension survey, 2012–2015. *Circulation* 2018;137:2344–56.
- Ma RCW. Epidemiology of diabetes and diabetic complications in China. *Diabetologia* 2018;61:1249–60.
- Xing L, Jing L, Tian Y, et al. Epidemiology of dyslipidemia and associated cardiovascular risk factors in northeast China: a cross-sectional study. *Nutr Metab Cardiovasc Dis* 2020;30:2262–70.
- Wu S, Wu B, Liu M, et al. China Stroke Study Collaboration. Stroke in China: advances and challenges in epidemiology, prevention, and management. *Lancet Neurol* 2019;18:394–405.
- Zhang S, Wang J, Xie F, et al. A cross-sectional study of job burnout, psychological attachment, and the career calling of Chinese doctors. *BMC Health Serv Res* 2020;20:193.
- Dyrbye LN, Shanafelt TD, Balch CM, Satele D, Sloan J, Freischlag J. Relationship between work-home conflicts and burnout among American surgeons: a comparison by sex. *Arch Surg* 2011;146:211–7.
- Ito N, Nagata T, Tatemichi M, Takebayashi T, Mori K. Needs survey on the priority given to periodical medical examination items among occupational physicians in Japan. *J Occup Health* 2018;60:502–14.

- [23] Wang L, Wang Z, Ma Q, Fang G, Yang J. The development and reform of public health in China from 1949 to 2019. *Global Health* 2019;15:45.
- [24] Terry DL, Woo MJ. Burnout, job satisfaction, and work-family conflict among rural medical providers. *Psychol Health Med* 2021;26:196–203.
- [25] Ewen C, Jenkins H, Jackson C, Jutley-Neilson J, Galvin J. Well-being, job satisfaction, stress and burnout in speech-language pathologists: a review. *Int J Speech Lang Pathol* 2021;23:180–90.
- [26] Mehta LS, Murphy DJ Jr. Strategies to prevent burnout in the cardiovascular health-care workforce. *Nat Rev Cardiol* 2021;18:455–6.
- [27] Ye GY, Davidson JE, Kim K, Zisook S. Physician death by suicide in the United States: 2012–2016. *J Psychiatr Res* 2021;134:158–65.
- [28] Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc* 2017;92:129–46.
- [29] Association of American Medical Colleges. The 2019 update: the complexities of physician supply and demand: projections from 2017 to 2032, Washington, DC: Association of American Medical Colleges 2019. Available at: <https://www.aamc.org/data/workforce/reports>.