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A cross-sectional survey on job satisfaction and working condition among doctors in tertiary public hospitals in Shanghai, China

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Abstract

Objectives: Doctors in public hospitals of China face considerable pressure and excessive workloads, which has caused much dissatisfaction with their job. The purpose of this study was to explore the job satisfaction of doctors and examine the influence of different sociodemographic characteristics.

Design: It was a cross-sectional study.

Setting: 11 tertiary public hospitals in Shanghai, China.

Participants: Questionnaires were given out randomly to 897 doctors, and 730 were returned completed (response rate = 81.37%). Doctors who were voluntary and signed the informed consent can be involved in the investigation.

Primary outcome measures: Doctors' job satisfaction.

Results: 64.8% participants were dissatisfied with jobs, 35.2% reported job satisfaction. Statistical analysis suggested that doctors' job satisfaction was related with professional title, types of patients that doctors satisfied or expected, working stress and its reflections, department, working hours, life stress, and patients' respect.

Conclusions: There was an urgent need to establish a more reasonable promotion and income system, encourage patients to accept two-way referral, shorten working hours, and help doctors keep a balance between work and family.

Keywords: job satisfaction; working condition; doctor; hospital; China.

Strengths and limitations of this study

- It provided a valuable reference for others interested in doctors' working conditions in China.
- This study has provided quantitative data on doctors' working conditions.
- Our research findings can only be representative of doctors in tertiary A public hospitals.
- Personal information of doctors was not included in the questionnaire.

Background

Work-related problems of doctors are growing global concerns, of which, doctors' job satisfaction was a heated topic[1] Job satisfaction means a lot for individuals and the society, such as burnout[2 3], mental health[4], work-family balance[5], and quality of care[6]. As the great importance of job satisfaction, studies have explored a lot about job satisfaction, including the status of different dimensions about job satisfaction, a large number of surveys on job satisfaction and its influencing factors, and interrelationships between burnout, work stress, mental health and job satisfaction among doctors, nurses, and medical staff in different departments, regions and countries. Scholars from different countries such as the United States, the United Kingdom, and German have tried to deal with problems about job dissatisfaction[7-9]. It was discovered that many factors had an influence on job satisfaction, including job pressure[10 11], interrelationships with patients and colleagues[12 13], personal factors (e.g., gender and educational background)[14], risk of the job[15], personal mental health[16], job size[17], financial status[18], specialty and department[19 20]. In addition, doctors themselves also paid great attention to job satisfaction. Doctors worldwide have kept fighting for their own rights to improve job satisfaction, working condition, professional accomplishments, and career development for a long time. For example, doctors in Poland[21] and the Czech Republic[22], have had conflicts with the governments regarding to overwork. Fortunately, doctors in many countries and regions have succeeded in this fight, which ultimately improve their job satisfaction, working efficiency, and care quality[23] .

Moreover, health care reform was always a significant stage leading to great changes in doctors' job satisfaction and working condition. China is in such an important stage. In the Chinese health care reform, the government paid considerable attention to reducing medication

costs[24]. Hospitals were expected to sell drugs to patients without adding a 15% profit, which may decrease the hospital's income[25]. Other policies such as controlling medication fees per visit and the cost of medical insurance have reduced doctors' decision-making power. Consequently, hospital management may force doctors to work overtime to augment or maintain hospital income if there was not enough compensation from the government[26]. Doctors had to change their behaviours to fulfil hospital income indicators. In China, 4,526,978[27] doctors were under increasing pressures to see more patients, meet increased administrative requirements, and keep up with government regulations. Moreover, the lives of doctors are threatened in hospitals due to poor doctor-patient relationships[28]. As doctors were overworked, underpaid, and under threat, some scholars have wondered who will be the next doctors in China[29].

Therefore, to improve the poor hope of being a doctor in China and to change the current condition of doctors' job dissatisfaction, the main purpose of this study was to find out factors influencing job satisfaction among doctors in China and provide practical recommendations to improve Chinese doctors' working conditions and their job satisfaction.

Methods

Subjects

Between 18 June and 27 September 2013, a cross-sectional survey on doctors' job satisfaction was conducted in Shanghai, China. 1000 doctors in 11 public hospitals were selected at random, however, 897 were willing to participant in the study. Among the 897 questionnaires, 730 were returned completed (there were not any missing data) with a valid response rate of 81.38%. Doctors who were voluntary and signed the informed consent can be involved in the investigation. To address the bias coming from misunderstandings of the questionnaire,

researchers of our program were responsible to explain confusing questions when doctors filled in questionnaires.

Instrument Development and Validation

The questionnaire was designed to examine doctors' working conditions as well as their job satisfaction. The questionnaire was designed based on the 5th National Health Service General Research by the National Health and Family Planning Commission of the People's Republic of China. The general survey of the National Health Service included job satisfaction of medical staff. It was a rigorously developed instrument, based on the well-known and widely used Minnesota Satisfaction Questionnaire. The content validity was verified through an expert panel discussion, which included 5 experts. Cronbach's α coefficient was calculated to test the internal consistency of this questionnaire, with the value of 0.646. The Kaiser-Meyer-Olkin (KMO) test was used as a screening test for factorability, for which the value of KMO between 0.7 and 0.8 indicated good validity. In this study, the KMO was 0.703 ($P < 0.001$), which suggested acceptable validity.

The instrument collected data on sociodemographic variables such as age, gender, level of education, position, professional title, and department. There were some multiple-choice questions about types of patients, including patients' types that doctors considered reasonable in different healthcare institutions, types doctors diagnosed actually, doctors' satisfaction with types of patients, and what types of patients they expect. In addition, it asked about doctors' working time, life stress, working stress, and the sources of working stress. This survey also required doctors to rate their relationship with patients and evaluate the medical expenses of their patients. Questions about working and life stress, and doctor-patient relationship were on a Likert 5-point scale, such as completed not respectful, relatively not respectful, moderate, relatively respectful, and very

respectful. Moreover, the question about doctors' job satisfaction was the observational variable.

Ethical Approval

The study protocol was approved by the ethics committee of the Second Military Medical University. Only voluntary doctors signing the informed consent were involved in this survey. It was guaranteed to protect participants' confidentiality.

Statistical Analysis

All data were entered into Epidata version 3.1 and analysed using SPSS version 19.0. Sociodemographic data were described using frequencies and percentages. Chi-square tests were employed to test the relations between doctors' job satisfaction and other factors. Logistic regression analysis was further used to verify the influence of factors on doctors' job satisfaction. All tests were two-way and $p < 0.05$ was considered statistically significant.

Results

Characteristics, working condition, and job satisfaction

897 questionnaires were given out to doctors and all were returned. Among 897 questionnaires, 730 were returned completed and without any missing data. Of the 730 valid questionnaires, 64.8% were dissatisfied with jobs, 35.2% reported job satisfaction. Male participants (55.8%) were more than the female (44.2%). More than half (70.6%) of them had an education level of master's or doctor's degree. Most participants were doctors (87.3%), only a small of them were directors (7.5%), unspecified staff (4.9%), and researchers (0.3%). The majority (75.5%) had a junior or intermediate professional title. Half of participants (54.5%) worked 46-60 hours a week. Most participants (85.0%) can partly or totally reach the hospital requirement on their working. In terms of life and working stress, 78.0% and 87.5% participants

reported they were suffering from great pressure; 78.9% reported their current working stress increased compared to that in the past year. Considering the aspects of working stress, the top three aspects reflecting working stress were working intensity (65.8%), long working time (57.7%), and high risk of the job (55.2%). In addition, only 36.3% doctors reported that their departments once organized a community health lecture; 56.4% departments once participated in a volunteer medical consultation. Moreover, participants believed patients with difficultly-diagnosed diseases (66.3%), serious diseases (62.1%), and rare diseases (53.3%) should seek medical treatment in tertiary A hospitals. However, in most participants' working time, they usually met patients with common diseases (83.0%), chronic diseases (67.9%), and the requirement of prescribing medicine (41.2%); only half of them (51.2%) were satisfied with the type of patients they met. When talking about which type of patients they expected, participants chose patients with difficultly-diagnosed diseases (63.0%), common diseases (52.1%), and serious diseases (47.7%). In the range of types of patients should seek medical treatment in community health system, most participants chose patients with common diseases (76.2%), the requirement of prescribing medicine (71.0%), and chronic diseases (66.7%). When evaluating the medical expenses of their patients, about half of participants (52.5%) thought the medical expenses were relatively or completely too expensive. Lastly, less than half of participants (43.8%) felt being respected by their patients (Table 1).

Table 1 Characteristics, working condition, and job satisfaction of participants

Univariate analysis of job satisfaction and its influencing factors

According to chi-square test, the relationships between job satisfaction and other factors were examined. Results indicated that some factors were significantly influenced doctors' job

satisfaction, including professional title (p = 0.005), department (p = 0.042), working hours every week (p = 0.015), whether the work within working hours can reach the hospital requirement (p = 0.008), life stress (p < 0.0001), working stress (p < 0.0001), whether current working stress increased compared to that in the past year (p < 0.0001), whether work intensity was the reflection of great working stress (p < 0.0001), whether long working time was the reflection of great working stress (p < 0.0001), whether high risk of the job was the reflection of great working stress (p < 0.0001), whether poor patient-doctor relationship was the reflection of great working stress (p = 0.001), whether fierce competition of professional title promotion was the reflection of great working stress (p = 0.001), whether bad social evaluation was the reflection of great working stress (p < 0.0001), whether patients with any kinds of diseases should seek medical treatment in tertiary A hospitals (p = 0.04), whether patients with requirement of prescribing medicine was the most doctors met in working hours (p < 0.0001), whether doctors were satisfied with the types of patients (p < 0.0001), whether patients with common diseases were the population doctors expected (p = 0.005), whether patients with acute diseases were the population doctors expected (p = 0.005), and the extent patients respected doctors (p < 0.0001).

Table 1 Characteristics, working condition, and job satisfaction of participants

Logistic regression analysis of job satisfaction and its influencing factors

Logistic regression analysis suggested that doctors' job satisfaction was related with such factors as junior professional title (p = 0.024), satisfaction with types of patients (p = 0.006), not expecting patients with common diseases (p = 0.041), working stress not increasing compared to that in the past year (p = 0.045), not considering work intensity was the reflection of great working stress (p = 0.011), and not considering bad social evaluation was the reflection of great working

stress (p = 0.002). In addition, values of ORs and 95% Wald confidence interval indicated the exact relationships. Compared to doctors with senior professional titles, doctors with junior professional titles were less satisfied with their job (OR = 0.420). Similar result was found among doctors did not expect patients with common diseases in most of working hours (vs. doctors expect patients with common diseases) (OR = 0.668). On the other side, doctors who were satisfied with the types of patients they met in working hours were more likely to be satisfied with their job compared to those without a clear feeling about this question (OR = 2.130). Doctors whose working stress did not get greater than that in the past year were more satisfied with their job (OR = 2.192). Doctors who did not consider work intensity (OR = 1.698) and bad social evaluation (OR = 2.097) were not reflections of great working stress shared more job satisfaction (Table 2).

Table 2 Logistic regression analysis of job satisfaction and its influencing factors

Discussion

According to results of this study, doctors' job satisfaction was influenced their professional title, patient composition, and working stress. Some factors like department, working hours, patients' respect, and life stress may also be related to job satisfaction.

First, unlike some studies in other countries and regions, demographic characteristics (e.g., gender and education background) were not influencing factors of job satisfaction[30 31]. Only doctors' professional title played a role, which was proved by other studies in China[5] and Canada[32]. Among doctors with junior professional titles, they were less satisfied with their job, which may be attributed to many other factors. Because doctors' income was related to their professional title[33], annual income of doctors with junior professional title was always lower than that of

doctors with senior professional title. However, studies have proposed that income had a positive influence of doctors' job satisfaction[2 5 18 34]. In addition, a study in the United Kingdom presented that young staff may fail to fully use their training, which was one of the possible reasons for low satisfaction[8]. This can also be explained by opportunities to use abilities and personal accomplishment during daily work, which were other aspects impeding young staff enjoying job satisfaction[35]. Moreover, doctors with junior professional title in China faced more difficulties. A study in China investigated the professional title system and discovered that doctors felt unfair in promotion of their professional titles[36]. It can be understood that young staff had greater demands of promotion, which would cause more dissatisfaction among them. Furthermore, the new policy about specialist standardisation training put more pressures on young staff, which required doctors to do an additional 2-4 years of specialist training after completing 3 years of resident standardisation training[37]. During this process, these young doctors were extremely unsatisfied with their income, when they were undertaking great economic burdens to support their families. Therefore, all these factors explained why doctors with junior professional titles were less likely to be satisfied with their job.

Second, patient composition was a significant factor influencing doctors' job satisfaction, which was for a particular phenomenon of China. Based on this survey, only 51.2% doctors were satisfied with types of patients they diagnosed, and the most were those with common diseases, which was the key leading to doctors' job dissatisfaction. Unlike the extreme two-way referral system in many developed countries (e.g., the United States), patients in China can choose any health institutions they prefer[38]. This discipline caused overcrowding in tertiary A public hospitals[39], no matter which types of diseases. In fact, many patients with common, mild, or

chronic diseases did not need to visit tertiary A public hospitals, which led to a waste of high-quality medical resources. Under this circumstance, doctors who wanted to eliminate pains of patients with serious, rare, or difficultly-diagnosed diseases would be disappointed at their work and feel desperate to improve themselves during clinical practices[7]. Therefore, job dissatisfaction appeared. To solve this problem, controlling hospital patient flow logistics[40] was the point. Encouraging patients and doctors to accept two-way referral was important, however, it should improve the health care quality of family doctors to make patients trust them. Moreover, it should realize that inadequate time spent in treatment of difficultly-diagnosed, serious, and rare diseases had a negative effect on doctors' skill development, which was the key point causing doctors' job dissatisfaction. Policy-makers and hospital administrators should provide more opportunities to doctors expecting patients with uncommon diseases, especially for those young staff.

Third, working stress was another important factor of job satisfaction, which was also discovered by another study[5]. However, there was a new finding from this study, relative working stress (e.g., comparing working stress to that in the past year) was more significant to predict job satisfaction than absolute working stress (e.g., evaluation of working stress at present). Doctors felt greater relative working stress would be more likely to be dissatisfied with their job. In addition, it should pay more attention to which aspect doctors considered as the reflection of working stress, especially the aspect of work intensity and social evaluation. Doctors in tertiary A public hospitals usually undertook great amount of clinical tasks, for example, owing to the excessive patients, doctors had to diagnose and treat them as fast as possible, which always compelled them to quit drinking water or going to the toilet[41]. What's worse, several doctors were reported a sudden death due to the huge work intensity[42]. Similar studies in other countries have

also stated that work intensity had a negative effect on job satisfaction[7 30]. Moreover, improving social evaluation would promote doctors' job satisfaction. At present, doctors did not have a good reputation because some of them pursued for personal economic interests by prescribing unnecessary medicine or tests for patients[43]. It must be pointed out that, however, many other doctors without such behaviours were trapped in such an embarrassing dilemma. Our society should maintain an objective and impartial attitude towards most doctors and supervise those with a poor reputation.

Fourth, it should pay attention to the working time. Working overtime has caused low job satisfaction and it was a problem among doctors worldwide, such as Britain[44], Spain[45], and Switzerland[34]. This research finding was similar. Although the European Working Time Directive ruled that junior doctors should work no more than 48 hours per week[46], it was unrealistic in China. Doctors had to work overtime, which often deprived their family time and spare time. However, a study has proposed that work-private hours played a significant role in job satisfaction[17]. In addition, in Chinese hospitals, doctors' payment was based on performance, which indicated that whether doctors met job requirements was much more important than long working hours. Moreover, performance was critical for promotion, especially for junior doctors. Therefore, the contradiction between promotion, income and long working time led to job dissatisfaction. There was an urgent need to shorten working hours per week and change current disciplines for promotion and income[47].

Fifth, it means a lot for doctors whether patients respected them. Owing to the overcrowding patients in tertiary A public hospitals, patients had to spend a long waiting time for registering, paying, and taking medicine compared to a short time meeting doctors. This unreasonable

phenomenon has reduced patients' satisfaction and their respect for doctors, and sometimes even violence against doctors[48]. To deal with this problem, a good patient-doctor relationship should be established by reducing patients in tertiary A public hospitals. If patients were willing to seek medical treatment in community healthcare system, doctors in tertiary A hospitals would spend more time diagnosing, treating, and communicating with patients while staying a good and patient attitude. To realize it, enhancing the community healthcare system and encouraging patients to choose health institutions reasonably were both important[49].

Last, life stress was the other aspect of stress-related phenomena combined with working stress. Some syndromes such as depression, burnout syndrome, and other psychiatric reactions should be taken into consideration[50]. Work-family conflict should also be addressed reasonably to avoid job dissatisfaction[5]. Moreover, it should be considered together with doctors' professional title and department. Doctors with junior titles may undertake more life stress from supporting their families, houses, and children. Therefore, paying more attention to doctors with heavier life and working stress would help them get more satisfied with their job. Doctors in different departments may also enjoy various extensions of job satisfaction[20], indicating hospital administrators could improve working conditions to various degrees according to departments where doctors were.

There are two limitations to this study. First, due to unwillingness to answer questions about some personal information, age distribution and income were not obtained, which made it impossible to explore the effects on job satisfaction. Second, this survey was only conducted in 11 tertiary A public hospitals of Shanghai, which could only represent the condition of doctors in such hospitals. Future studies will enlarge example size and explore more influencing factors.

Conclusions

In conclusion, nearly 65% of doctors were not satisfied with their job in Shanghai, China, which was mainly influenced by their professional title, patient composition, working and life stress, working hours, patients' respect, and department. To address this problem, it should encourage policy-makers and hospital administrators to establish the two-way referral system, improve the current promotion and income system, shorten working hours, pay more attention to young staff, and help doctors keep a balance between work and family.

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Authors' contributions

This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must point out that the four authors—JL, WY, TD, ML—contributed equally to this research. Here are the specific efforts of each author. JL, WY, TD, ML made substantial contributions to conception and design, analysis and interpretation of data, drafting the manuscript and revising it critically for important intellectual content. LZ made substantial contributions to conception and design. All authors read and gave final approval of the version to be published.

Conflict of interest None declared.

Data sharing statement No additional data are available.

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435 **Table 1 Characteristics, working condition, and job satisfaction of participants**

	N (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction N (%)	Satisfaction N (%)		
		473 (64.8)	257 (35.2)		
Gender				1.448	0.229
Male	407 (55.8)	256 (62.9)	151 (37.1)		
Female	323 (44.2)	217 (67.2)	106 (32.8)		
Level of education				4.565	0.207
Junior College degree	11 (1.5)	4 (36.4)	7 (63.6)		
Bachelor's degree	203 (27.8)	128 (63.1)	75 (36.9)		
Master's degree	331 (45.3)	218 (65.9)	113 (34.1)		
Doctor's degree	185 (25.3)	123 (66.5)	62 (33.5)		
Position				6.800	0.147
Leader of a hospital	0 (0.0)	0 (0.0)	0 (0.0)		
Leader of a department	0 (0.0)	0 (0.0)	0 (0.0)		
Director of a clinical department	51 (7.0)	32 (62.7)	19 (37.3)		
Director of medical a technology department	4 (0.5)	2 (50.0)	2 (50.0)		
Director of pharmacy	0 (0.0)	0 (0.0)	0 (0.0)		
Doctor	637 (87.3)	420 (65.9)	217 (34.1)		
Researcher	2 (0.3)	0 (0.0)	2 (100.0)		
Unspecified staff	36 (4.9)	19 (52.8)	17 (47.2)		
Professional title				12.674	0.005
Junior	249 (34.1)	164 (65.9)	85 (34.1)		
Intermediate	302 (41.4)	204 (67.5)	98 (32.5)		
Associate senior	127 (17.4)	83 (65.4)	44 (34.6)		
Senior	52 (7.1)	22 (42.3)	30 (57.7)		
Department				8.213	0.042
Others	84 (11.5)	51 (60.7)	33 (39.3)		
Medical technology	46 (6.3)	25 (54.3)	21 (45.7)		
Internal medicine	319 (43.7)	224 (70.2)	95 (29.8)		
Surgery	281 (38.5)	173 (61.6)	108 (38.4)		
Working hours per week (hours)				26.334	0.015
≤40	90 (12.3)	44 (48.9)	46 (51.1)		
41-45	57 (7.8)	33 (57.9)	24 (42.1)		
46-50	176 (24.1)	119 (67.6)	57 (32.4)		
51-55	44 (6.0)	33 (75.0)	11 (25.0)		
56-60	178 (24.4)	124 (69.7)	54 (30.3)		
61-65	49 (6.7)	34 (69.4)	15 (30.6)		
66-70	55 (7.5)	32 (58.2)	23 (41.8)		
71-75	17 (2.3)	14 (82.4)	3 (17.6)		
76-80	32 (4.4)	22 (68.8)	10 (31.3)		

81-85	7 (1.0)	6 (85.7)	1 (14.3)		
86-90	5 (0.7)	1 (20.0)	4 (80.0)		
91-95	2 (0.3)	1 (50.0)	1 (50.0)		
96-100	13 (1.8)	7 (53.8)	6 (46.2)		
≥101	5 (0.7)	3 (60.0)	2 (40.0)		
Whether the work within working hours can reach the hospital requirement				13.846	0.008
Completely can	253 (34.7)	161 (63.6)	92 (36.4)		
Mostly can	367 (50.3)	224 (61.0)	143 (39.0)		
Mostly cannot	68 (9.3)	55 (80.9)	13 (19.1)		
Completely cannot	20 (2.7)	15 (75.0)	5 (25.0)		
Hard to say	22 (3.0)	18 (81.8)	4 (18.2)		
Life stress				20.524	<0.0001
Very light	2 (0.3)	2 (100.0)	0 (0.0)		
Relatively light	6 (0.8)	3 (50.0)	3 (50.0)		
Moderate	153 (21.0)	80 (52.3)	73 (47.7)		
Relatively great	362 (49.6)	234 (64.6)	128 (35.4)		
Very great	207 (28.4)	154 (74.4)	53 (25.6)		
Working stress					
Very light	0 (0.0)	0 (0.0)	0 (0.0)	39.135	<0.0001
Relatively light	3 (0.4)	0 (0.0)	3 (100.0)		
Moderate	88 (12.1)	37 (42.0)	51 (58.0)		
Relatively great	358 (49.0)	225 (62.8)	133 (37.2)		
Very great	281 (38.5)	211 (75.1)	70 (24.9)		
Whether current working stress increased compared to that in the past year				20.777	<0.0001
Yes	576 (78.9)	392 (68.1)	184 (31.9)		
No	73 (10.0)	30 (41.1)	43 (58.9)		
Hard to say	81 (11.1)	51 (63.0)	30 (37.0)		
Reflection of great working stress					
Work intensity	480 (65.8)	341 (71.0)	139 (29.0)	23.979	<0.0001
Long working time	421 (57.7)	303 (72.0)	118 (28.0)	22.459	<0.0001
High expectations of patients	341 (46.7)	230 (67.4)	111 (32.6)	1.976	0.160
High risks of the job	403 (55.2)	291 (72.2)	112 (27.8)	21.678	<0.0001
Poor patient-doctor relationship	396 (54.2)	277 (69.9)	119 (30.1)	10.083	0.001
Poor colleague relationship	42 (5.8)	33 (78.6)	9 (21.4)	3.708	0.054
Fierce competition of professional title promotion	310 (42.5)	223 (71.9)	87 (28.1)	12.045	0.001
Bad social evaluation	205 (28.1)	162 (79.0)	43 (21.0)	25.303	<0.0001
Misunderstanding from the society	302 (41.8)	208 (68.2)	97 (31.8)	2.658	0.103
Whether departments once organized a community health lecture				1.542	0.214
No	465 (63.7)	309 (66.5)	156 (33.5)		
Yes	265 (36.3)	164 (61.9)	101 (38.1)		
Whether departments once participated in a volunteer medical consultation				0.213	0.644
No	318 (43.6)	209 (65.7)	109 (34.3)		

Yes	412 (56.4)	264 (64.1)	148 (35.9)		
Which type of patients should seek medical treatment in tertiary A public hospitals (MCQ)					
All types	301 (41.2)	182 (60.5)	119 (39.5)	4.209	0.040
Chronic diseases	165 (22.6)	98 (59.4)	67 (40.6)	2.726	0.099
Rare diseases	389 (53.3)	258 (66.3)	131 (33.7)	0.854	0.355
Common diseases	171 (23.4)	105 (61.4)	66 (38.6)	1.126	0.289
Acute diseases	321 (44.0)	211 (65.7)	110 (34.3)	0.221	0.638
Difficultly-diagnosed diseases	484 (66.3)	321 (66.3)	163 (33.7)	1.470	0.225
Rehabilitation	71 (9.7)	45 (63.4)	26 (36.6)	0.069	0.793
Serious diseases	453 (62.1)	294 (64.9)	159 (35.1)	0.006	0.939
Which type of patients doctors met in most working hours (MCQ*)					
Chronic diseases	496 (67.9)	321 (64.7)	175 (35.3)	0.004	0.950
Rare diseases	82 (11.2)	46 (56.1)	36 (43.9)	3.063	0.080
Common diseases	606 (83.0)	399 (65.8)	207 (34.2)	1.715	0.190
Acute diseases	140 (19.2)	87 (62.1)	53 (37.9)	0.534	0.465
Difficultly-diagnosed diseases	190 (26.0)	114 (60.1)	76 (40.0)	2.588	0.108
Rehabilitation	81 (11.1)	52 (64.2)	29 (35.8)	0.014	0.905
Serious diseases	150 (20.5)	87 (58.0)	63 (42.0)	3.821	0.051
Prescribing medicine	301 (41.2)	221 (73.4)	80 (26.6)	16.713	<0.0001
Whether doctors were satisfied with types of patients they met				49.153	<0.0001
Satisfied	374 (51.2)	198 (52.9)	176 (47.1)		
Not satisfied	241 (33.0)	192 (79.7)	49 (20.3)		
Hard to say	115 (15.8)	83 (72.2)	32 (27.8)		
Which type of patients doctors expect (MCQ*)					
Chronic diseases	267 (36.6)	162 (60.7)	105 (39.3)	3.133	0.077
Rare diseases	338 (46.3)	224 (66.3)	114 (33.7)	0.603	0.438
Common diseases	380 (52.1)	228 (60.0)	152 (40.0)	7.987	0.005
Acute diseases	196 (26.8)	143 (73.0)	53 (27.0)	7.830	0.005
Difficultly-diagnosed diseases	460 (63.0)	305 (66.3)	155 (33.7)	1.243	0.265
Rehabilitation	69 (9.5)	43 (62.3)	26 (37.7)	0.205	0.651
Serious diseases	348 (47.7)	238 (68.4)	110 (31.6)	3.770	0.052
Prescribing medicine	62 (8.5)	44 (71.0)	18 (29.0)	1.132	0.287
Which type of patients should seek medical treatment in community health system (MCQ*)					
Chronic diseases	487 (66.7)	322 (66.1)	165 (33.9)	1.125	0.289
Rare diseases	27 (3.7)	15 (55.6)	12 (44.4)	1.049	0.306
Common diseases	556 (76.2)	360 (64.7)	196 (35.3)	0.002	0.963
Acute diseases	33 (4.5)	19 (57.6)	14 (42.4)	0.790	0.374
Difficultly-diagnosed diseases	30 (4.1)	23 (76.7)	7 (23.3)	1.933	0.164
Rehabilitation	368 (50.4)	251 (68.2)	117 (31.8)	3.787	0.052
Serious diseases	23 (3.2)	15 (65.2)	8 (34.8)	0.002	0.966
Prescribing medicine	518 (71.0)	343 (66.2)	175 (33.8)	1.580	0.209
Evaluation of medical expenses of patients in tertiary A hospitals				8.352	0.079
Very cheap	28 (3.8)	24 (85.7)	4 (14.3)		
Relatively cheap	35 (4.8)	26 (74.3)	9 (25.7)		

Moderate	284 (38.9)	176 (62.0)	108 (38.0)		
Relatively expensive	334 (45.8)	213 (63.8)	121 (36.2)		
Very expensive	49 (6.7)	34 (69.4)	15 (30.6)		
Evaluation of the extent patients respect doctors				44.764	<0.0001
Completely not respect	13 (1.8)	11 (84.6)	2 (15.4)		
Relatively not respect	43 (5.9)	36 (83.7)	7 (16.3)		
Moderate	354 (48.5)	260 (73.4)	94 (26.6)		
Relatively respect	284 (38.9)	145 (51.1)	139 (48.9)		
Completely respect	36 (4.9)	21 (58.3)	15 (41.7)		

Asterisk (*): MCQ means multiple-choice question. Participants can choose more than one option in this question.

439 **Table 2 Logistic regression analysis of job satisfaction and its influencing factors**

Parameter	Estimate	P-value	OR	95% Wald confidence interval	
				Lower limit	Upper limit
Professional title					
Junior	-0.867	0.024	0.420	0.198	0.891
Intermediate	-0.651	0.079	0.522	0.252	1.079
Associate senior	-0.634	0.112	0.530	0.242	1.160
Senior	Ref	Ref	Ref	Ref	Ref
Department					
Others	0.039	0.901	1.040	0.563	1.918
Medical technology	-0.114	0.778	0.893	0.405	1.967
Internal medicine	-0.259	0.221	0.772	0.510	1.168
Surgery	Ref	Ref	Ref	Ref	Ref
Working hours per week (hours)					
≤40	-0.045	0.970	0.956	0.089	10.236
41-45	-0.527	0.667	0.590	0.053	6.527
46-50	-0.293	0.806	0.746	0.072	7.758
51-55	-0.573	0.646	0.564	0.049	6.473
56-60	-0.572	0.631	0.564	0.055	5.819
61-65	-0.179	0.883	0.836	0.076	9.181
66-70	-0.110	0.928	0.896	0.083	9.716
71-75	-1.188	0.384	0.305	0.021	4.420
76-80	-0.502	0.687	0.606	0.053	6.939
81-85	-0.617	0.710	0.540	0.021	13.966
86-90	2.293	0.185	9.905	0.335	293.111
91-95	0.713	0.721	2.041	0.040	103.175
96-100	0.107	0.936	1.113	0.081	15.218
≥101	Ref	Ref	Ref	Ref	Ref
Whether the work within working hours can reach the hospital requirement					
Completely can	0.523	0.399	1.687	0.501	5.683
Mostly can	0.875	0.155	2.400	0.719	8.015
Mostly cannot	-0.129	0.853	0.879	0.224	3.452
Completely cannot	0.403	0.648	1.496	0.266	8.422
Hard to say	Ref	Ref	Ref	Ref	Ref
Life stress					
Very light	-20.905	0.999	—	—	—
Relatively light	-20.035	0.999	—	—	—
Moderate	0.119	0.725	1.127	0.579	2.191
Relatively great	-0.145	0.608	0.865	0.497	1.506
Very great	Ref	Ref	Ref	Ref	Ref
Working stress					
Very light	—	—	—	—	—
Relatively light	40.554	0.999	—	—	—
Moderate	0.690	0.084	1.993	0.911	4.361
Relatively great	0.051	0.843	1.053	0.633	1.751

Very great	Ref	Ref	Ref	Ref	Ref
Whether current working stress increased compared to that in the past year					
Yes	0.208	0.502	1.231	0.671	2.257
No	0.785	0.045	2.192	1.017	4.724
Hard to say	Ref	Ref	Ref	Ref	Ref
Whether work intensity was the reflection of great working stress					
No	0.530	0.011	1.698	1.127	2.560
Yes	Ref	Ref	Ref	Ref	Ref
Whether long working time was the reflection of great working stress					
No	0.333	0.102	1.395	0.936	2.079
Yes	Ref	Ref	Ref	Ref	Ref
Whether high risks of the job was the reflection of great working stress					
No	0.248	0.206	1.282	0.873	1.882
Yes	Ref	Ref	Ref	Ref	Ref
Whether poor patient-doctor relationship was the reflection of great working stress					
No	-0.129	0.515	0.879	0.597	1.296
Yes	Ref	Ref	Ref	Ref	Ref
Whether fierce competition of professional title was the reflection of great working stress					
No	0.210	0.291	1.234	0.835	1.822
Yes	Ref	Ref	Ref	Ref	Ref
Whether bad social evaluation was the reflection of great working stress					
No	0.740	0.002	2.097	1.312	3.350
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with any kinds of diseases should seek medical treatment in tertiary A hospitals					
No	0.041	0.831	1.042	0.713	1.523
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with requirement of prescribing medicine was the most doctors met in working hours					
No	0.157	0.450	1.170	0.779	1.757
Yes	Ref	Ref	Ref	Ref	Ref
Whether doctors were satisfied with types of patients they met					
Satisfied	0.756	0.006	2.130	1.249	3.632
Not satisfied	-0.330	0.288	0.719	0.391	1.322
Hard to say	Ref	Ref	Ref	Ref	Ref
Whether patients with common diseases were the population doctors expected					
No	-0.403	0.041	0.668	0.454	0.983
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with acute diseases were the population doctors expected					
No	0.356	0.104	1.428	0.929	2.195
Yes	Ref	Ref	Ref	Ref	Ref
Evaluation of the extent patients respect doctors					
Completely not respect	-1.007	0.319	0.365	0.050	2.648
Relatively not respect	-0.589	0.354	0.555	0.160	1.929
Moderate	-0.364	0.414	0.695	0.290	1.666
Relatively respect	0.458	0.302	1.581	0.663	3.773
Completely respect	Ref	Ref	Ref	Ref	Ref

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-6
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-7
		(*b*) Describe any methods used to examine subgroups and interactions	6-7
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-7
		(*e*) Describe any sensitivity analyses	6-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	5
		(c) Consider use of a flow diagram	5
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7-8
		(b) Indicate number of participants with missing data for each variable of interest	5
Outcome data	15*	Report numbers of outcome events or summary measures	7
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	8-10
		(*b*) Report category boundaries when continuous variables were categorized	8-10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for	8-10

		a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	8-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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A cross-sectional survey on job satisfaction and its associated factors among doctors in tertiary public hospitals in Shanghai, China

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A cross-sectional survey on job satisfaction and its associated factors among doctors in tertiary public hospitals in Shanghai, China

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Abstract

Objectives: Doctors in public hospitals of China face considerable pressure and excessive workloads, which are likely to predispose to job dissatisfaction. We explored the job satisfaction of doctors and examined the influence of diverse sociodemographic characteristics.

Design: This was a cross-sectional study.

Setting: Eleven tertiary public hospitals in Shanghai, China.

Participants: The questionnaire was designed based on the 5th National Health Service General Research and the Minnesota Satisfaction Questionnaire. Questionnaires were administered to 897 doctors randomly (using random number tables), and 730 were returned completed (response rate = 81.4%). Doctors who volunteered and provided informed, written consent participated.

Primary outcome measures: The dependent variable was doctors' job satisfaction.

Results: Statistical analyses were conducted using SPSS and SAS. Overall, 64.8% of participants were dissatisfied with their jobs. Factors statistically significant to doctors' job satisfaction in the univariate analysis were entered into the logistic regression analysis, including doctors' professional title, department, work hours, work requirements (reflected as the number of patients they diagnosed and treated monthly), life and work stress, and types of patients that doctors treated or expected to treat . Logistic regression analysis results suggested that doctors' job satisfaction was related to their professional title, types of patients that doctors treated or expected to treat, as well as their work stress.

Conclusions: There is an urgent need for public hospitals in China to establish a more reasonable promotion and management system for doctors, encourage patients to accept two-way referral, pay more attention to less-experienced staff, and help doctors release their work stress.

Keywords: job satisfaction; doctor; hospital; China

Strengths and limitations of this study

- We tried to improve doctors' job satisfaction and promote becoming a doctor in China.
- We provided a valuable reference for others interested in doctors' job satisfaction and working conditions in China.
- We provided quantitative data concerning doctors' working conditions.
- Our research findings are only representative of doctors in tertiary A public hospitals in China.

Background

Work-related problems of doctors are growing global concerns, especially doctors' job satisfaction[1]. Job satisfaction comprises issues such as burnout[2 3], mental health[4], work-family balance[5], and quality of care[6]. Several studies have explored job satisfaction, including its diverse dimensions[2]; its influencing factors[7]; and interrelationships between burnout[3], work stress[8 9], mental health[4] and job satisfaction among doctors, nurses, and medical staff in diverse departments, regions and countries[10].

Scholars from different countries such as the United States, the United Kingdom, and Germany have tried to deal with problems concerning job dissatisfaction[11-13]. For example, scholars in the United States noted that workload, work meaningfulness, relational needs, tolerance, and risk-taking attitudes were associated with job satisfaction[11]. Researchers in the United Kingdom indicated that whether physicians can fully use their training was a key factor influencing their job satisfaction[12]. Scholars in Germany paid more attention to foreign-national physicians and suggested that human relations and social status were related to their job satisfaction[13]. In addition, job characteristics[9 10 14-18] and personal factors[19-22] have been found to affect job satisfaction.

Further, doctors themselves pay great attention to job satisfaction. Doctors worldwide fight for their own rights to improve job satisfaction, working condition, professional accomplishments, and career development. For example, doctors in Poland[23] and the Czech Republic[24] have had conflicts with their respective

governments regarding overwork. Fortunately, doctors in many countries and regions have succeeded in this fight, which ultimately improve their job satisfaction, work efficiency, and care quality[25].

Moreover, healthcare reform is a vital component of doctors' job satisfaction and working conditions, and China is no exception. In Chinese healthcare reform, the government pays considerable attention to reducing medication costs[26]. Hospitals are expected to sell drugs to patients without adding a 15% profit, which may decrease the hospital's income[27]. Other policies such as controlling medication fees per visit and the cost of medical insurance have reduced doctors' decision-making power. Consequently, hospital management may force doctors to work overtime to augment or maintain hospital income if there is not enough government compensation[28]. Moreover, doctors had to change their behaviors to fulfil hospital income indicators. In China, over 4.5 million doctors are under increasing pressures to see more patients, meet increased administrative requirements, and keep up with government regulations[29]. Moreover, the lives of doctors are threatened in hospitals owing to poor doctor-patient relationships[30]. As doctors are overworked, underpaid, and under threat, some scholars have wondered who will be the next doctors in China[31].

Therefore, the main purpose of this study was to promote the development of more doctors in China and to enhance the condition of doctors. We determined what factors affect doctors' job satisfaction in China and provide practical recommendations to improve Chinese doctors' job satisfaction and working conditions.

Methods

Participants

Between June 18 and September 27, 2013, a cross-sectional survey about doctors' job satisfaction was conducted in Shanghai, China. Using random number tables, we selected eleven tertiary public hospitals in Shanghai. Questionnaires were administered to 1,000 doctors in these hospitals. All participants were also chosen through random number tables, which were based on doctors' job number. Among the 1,000 participants, 897 were willing to participate, and 103 doctors were excluded from this study because of their unwillingness. Of these, 730 were returned complete (valid response rate = 81.4%). Doctors who volunteered and provided informed, written consent participated. Researchers addressed doctors' queries and doubts regarding the questionnaire as needed.

Instrument Development and Validation

The questionnaire was designed to examine doctors' working conditions and job satisfaction. The questionnaire was designed based on the 5th National Health Service General Research by the National Health and Family Planning Commission of the People's Republic of China[32]. The general survey of the National Health Service included job satisfaction of medical staff. It was a rigorously developed instrument, based on the well-known and widely used Minnesota Satisfaction Questionnaire[33]. Its content validity was verified through an expert panel discussion, which included 5 experts. To determine the internal consistency of this questionnaire, Cronbach's α coefficient was calculated, which was 0.65. The Kaiser-Meyer-Olkin (KMO) test was

used as a screening test for factorability, which was 0.703 ($p < 0.001$), indicating acceptable validity.

We collected data on sociodemographic variables such as age, sex, education level, position, professional title, and department. Positions comprised directors, doctors, researchers, and unspecified staff. The unspecified staff were doctorial students studying and working in these hospitals. There were some structured questions about types of patients, including types of patients that doctors thought should be treated in different healthcare institutions, doctors' satisfaction with the types of patients they were treating, and what types of patients they expected to treat. In addition, we asked about doctors' work time, life stress, work stress, and the sources of work stress. The sources of work stress included work intensity, long hours, patients' lofty expectations, job risks, poor patient-doctor relationships, poor colleague relationships, competition for promotion, poor social evaluations, and societal misunderstandings. Work intensity reflected the quantum of doctors' work, which was mainly evaluated by the number of patients that doctors diagnosed and treated (including surgery). Poor social evaluations reflected doctors' reputation among patients, which considered doctors' professional abilities and personal characteristics. We also asked doctors to rate their relationships with patients and evaluate patients' medical expenses. Questions about working and life stress, and doctor-patient relationships were measured using a 5-point Likert scale (*not respectful*, *relatively not respectful*, *moderate*, *relatively respectful*, and *very respectful*). The question about doctors' job satisfaction was the dependent variable.

Ethical Approval

The study protocol was approved by the ethics committee of the Second Military Medical University. We protected participants' confidentiality.

Statistical Analyses

All data were entered into Epidata version 3.1 and analyzed using SPSS version 19.0 and SAS version 8.0. Sociodemographic data were described using frequencies and percentages. Chi-square tests were employed to test the differences in job satisfaction among doctors with different personal characteristics and other factors. A logistic regression analysis was further used to verify the influence of factors on doctors' job satisfaction. In the logistic regression analysis, the dependent variable was doctors' job satisfaction. Independent variables entered into the logistic regression analysis were based on the univariate analysis results that were all significantly related to doctors' job satisfaction. We employed the stepwise selection method, with inclusion criteria of 0.10 and exclusion criteria of 0.15. We also employed a multicollinearity analysis to test collinearity. All tests were two-tailed and $p < 0.05$ were considered significant.

Patient and Public Involvement

We declare that no patients or public were involved in this study.

Results

Characteristics, Working Condition, and Job Satisfaction

Overall, 64.8% of participants were dissatisfied with their jobs. Participants' personal and job characteristics are shown in Table 1.

Table 1. Participants' personal and job characteristics

Working conditions and participants' job satisfaction are shown in Table 2. Most participants worked more than 40 hours a week. Most doctors can basically reach the hospitals' working requirements, which were reflected as the number of patients they diagnosed and treated monthly. Most reported work and life stress, which had increased in the last year, and was due to working intensity, long hours, and job risks. In addition, about one-third of doctors reported that their departments organized a community health lecture, and more than half of the departments participated in a volunteer medical consultation.

Table 2. Working conditions and participants' job satisfaction

Considering the types of patients, participants believed patients with difficult-to-diagnose diseases, serious diseases, and rare diseases should seek medical treatment in tertiary A hospitals. Most participants treated patients with common diseases, chronic diseases, and those seeking medicine; only about half of them were satisfied with the type of patients they met, which differed from who they were expecting to treat more often. Participants felt that many of these patients should seek medical treatment in the community health system especially patients with common and chronic diseases, and those seeking medicine. Further, about half of the participants thought patients' medical expenses were costly. Lastly, less than half of the participants felt respected by their patients (Table 3).

Table 3. Patient-related issues and job satisfaction

Univariate Analysis of Job Satisfaction and its Influencing Factors

Using chi-square tests, the relationships between job satisfaction and other factors were examined. Results indicated that several factors significantly influenced doctors' job satisfaction (all p-values < 0.05), including the following: professional title (χ^2 = 12.674), department (χ^2 = 8.213), work hours every week (χ^2 = 16.935), whether the work within working hours met hospital requirements (χ^2 = 13.846), life stress (χ^2 = 20.524), work stress (χ^2 = 39.135), whether current work stress increased compared to that in the past year (χ^2 = 20.777), whether work intensity reflected work stress (χ^2 = 23.979), whether working long hours reflected work stress (χ^2 = 22.459), whether high jobs risks reflected work stress (χ^2 = 21.678), whether a poor patient-doctor relationship reflected work stress (χ^2 = 1.083), whether competition for promotion reflected work stress (χ^2 = 12.045), whether a poor social evaluation reflected work stress (χ^2 = 25.303), whether patients should seek medical treatment in tertiary A hospitals (χ^2 = 4.209), whether patients seeking medicine were the most common type doctors treated (χ^2 = 16.713), whether doctors were satisfied with the type of patients they treated (χ^2 = 49.153), whether patients with common diseases were the population doctors expected (χ^2 = 7.987), whether patients with acute diseases were the population doctors expected (χ^2 = 7.830), and the extent patients respected doctors (χ^2 = 44.764) (Tables 1–3).

Logistic Regression Analysis of Job Satisfaction and its Influencing Factors

Variables that were significant to doctors' job satisfaction in the univariate analysis were included in the logistic regression analysis. To testify the collinearity among variables, a multicollinearity analysis was conducted. If tolerance is < 0.1 or

the variance inflation factor (VIF) is > 5, collinearity exists. The multicollinearity analysis indicated that collinearity did not exist (Supplementary Table 1).

As shown in Table 4, 9 factors were entered into the logistic regression model. Doctors who were satisfied with the types of patients they treated were more likely to be satisfied with their job compared to those who were not satisfied. Doctors who did not consider work intensity or poor social evaluation as reflective of their work stress had more job satisfaction than did their counterparts. Doctors who felt moderate work stress felt more satisfied with their job compared with those with great work stress. Doctors who had an expectation of treating patients with common diseases were more satisfied with their jobs. Lastly, doctors with senior professional titles were more satisfied with their job compared with doctors with lower-level titles.

Table 4. Logistic regression analysis of job satisfaction and its influencing factors

Discussion

Doctors' job satisfaction was influenced by their professional title, patient composition, and work stress. Some factors like department, work hours, patients' respect, and life stress were also related to doctors' job satisfaction.

First, unlike some studies in other countries and regions, demographic characteristics (e.g., sex and education background) were not influencing factors of job satisfaction[34 35]. Only doctors' professional title played a role, which was supported by other studies in China[5] and Canada[36]. Junior doctors were less satisfied with their job, which may be attributed to many other factors. Because doctors' income was related to their professional title[37], the annual income of junior doctors

was always lower than that of senior doctors. However, studies have proposed that income positively influences doctors' job satisfaction[2 5 17 38]. In addition, a study in the United Kingdom noted that young staff may fail to fully use their training, which could foster low satisfaction[12]. This can also be explained by opportunities to use one's abilities and personal accomplishments during daily work, which were other aspects impeding young staff from enjoying job satisfaction[7]. Moreover, junior doctors in China face additional difficulties, including an unfair promotion system[39]. Furthermore, the new policy about specialist standardization training places more pressure on young staff, since it requires doctors to do an additional 2–4 years of specialist training after completing 3 years of resident standardization training[40]. During this process, young doctors may become unsatisfied with their income and their inability to support their families, which, in turn, promotes further job dissatisfaction.

Second, patient composition was a significant factor influencing doctors' job satisfaction. Around 51.2% of the doctors were satisfied with the type of patients they treated; however, 52.1% of the doctors mostly treated patients with common diseases every day. The low satisfaction seemed to reflect the gap between their expectations and the reality. Because doctors in tertiary A public hospitals have the best professional abilities and hope to deal with the most difficult and complicated diseases, they expect to treat patients with difficult-to-diagnose diseases. However, unlike the two-way referral system in many developed countries (e.g., the United States), patients in China can choose the health institution they prefer[41]. This causes

overcrowding in tertiary A public hospitals[42], regardless of disease type. In fact, many patients with common, mild, or chronic diseases do not need to visit tertiary A public hospitals, as this wastes high-quality medical resources. Under these circumstances, doctors who wish to solve difficult-to-diagnose cases feel disappointed and dissatisfied with their work[11]. To solve this problem, hospital patient flow logistics should be controlled[43]. Encouraging patients and doctors to accept two-way referral is vital; however, the level of trust between doctors and patients is also critical. Moreover, it should be noted that inadequate time spent treating difficult-to-diagnose diseases has a negative effect on doctors' skill development, which can also cause doctors' job dissatisfaction. Policymakers and hospital administrators should provide more opportunities to doctors expecting more difficult-to-diagnose patients, especially junior doctors.

Third, work stress was related to job satisfaction, which supported a past study[5]. However, we also found that relative work stress (i.e., comparing work stress to that in the past year) more significantly predicted job satisfaction than did present work stress. Doctors who felt greater relative work stress were more likely to be dissatisfied with their job than their counterparts. In addition, the factors that doctors consider as reflective of work stress, especially work intensity and social evaluation, require attention. Doctors working in tertiary A public hospitals usually undertake many clinical tasks; for example, because of the excess of patients, doctors have to diagnose and treat them as fast as possible, which limits doctors' ability to take breaks[44]. What is worse, several doctors died suddenly, possibly owing to the work intensity[45].

Similar studies in other countries have also stated that work intensity negatively affects job satisfaction[11 34]. Moreover, improving their social evaluation may improve doctors' job satisfaction. At present, doctors in China do not have a good reputation because of some doctors pursuing personal economic interests by prescribing unnecessary medicine or tests for patients[46]. It must be noted that there are many other doctors who do not resort to such unethical practices; however, they also become victims of this stigmatization. Our society should maintain an objective and impartial attitude towards most doctors and supervise those with a poor reputation.

Fourth, doctors' long work hours require attention. Working overtime has caused low job satisfaction worldwide, such as in Britain[47], Spain[48], and Switzerland[38]. Our finding was similar. Although the European Working Time Directive ruled that junior doctors should work no more than 48 hours per week[49], this was unrealistic in China. Doctors have to work overtime, which often limits their family time and spare time. However, a study proposed that work-private hours also play a key role in job satisfaction[9]. In addition, in Chinese hospitals, doctors' payment is based on their performance, indicating that meeting job requirements may be more critical than working long hours. Moreover, performance is critical for promotion, especially for junior doctors. Therefore, there is an urgent need to shorten doctors' weekly work hours and change the current promotion and income structure, which may promote increased job satisfaction[50].

Fifth, it is reasonable to assume that if doctors feel respected by patients, they will be more satisfied with their work. Great respect from patients indicated their

great recognition of doctors' professional abilities, personal characteristics, and good reputation. All of these good aspects would accelerate doctors' enthusiasms of their work, which then reflected as job satisfaction. However, due to the overcrowding of patients in tertiary A public hospitals, patients spend a long time waiting to register, pay, and fill prescriptions compared to a short time meeting doctors. This unreasonable phenomenon has reduced patients' satisfaction and their respect for doctors, and sometimes even results in violence against doctors[51]. Therefore, faced with the poor patient-doctor relationship and violence from patients, it is more possible to cause doctors' job dissatisfaction. To deal with this problem and enhance the patient-doctor relationship, the number of patients visiting tertiary A public hospitals should be decreased. If patients with common or minor diseases are willing and encouraged to seek medical treatment in the community healthcare system, doctors at tertiary A hospitals can spend more time diagnosing, treating, and communicating with patients, while maintaining a positive and patient attitude[52].

Lastly, other life stress is also related to job satisfaction, and problems such as depression and burnout require consideration[53]. Work-family conflict should also be addressed to avoid job dissatisfaction[5]. Moreover, doctors' professional title and department may factor into job satisfaction. Junior doctors may undertake more life stress from supporting their families; therefore, these doctors may require additional support. Doctors in different departments may also enjoy various extensions of job satisfaction[18], indicating hospital administrators could improve working conditions to various degrees according to departments where doctors were.

There are two limitations to this study. First, due to doctors' unwillingness to answer questions about certain personal information, information on age distribution and income were not obtained, which made it impossible to explore the effects of these on job satisfaction. Second, this survey was only conducted in eleven tertiary A public hospitals in Shanghai, which limits generalizability. Future studies should include more hospitals and more possible factors.

Conclusions

In conclusion, most doctors were not satisfied with their jobs in Shanghai, China, and this was mainly influenced by their professional title, patient composition, and work stress. To address this problem, policymakers and hospital administrators should establish the two-way referral system, improve the current promotion and income structure, pay more attention to less-experienced staff, and help doctors release their work stress.

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Authors' contributions

This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must point out that the four authors—JL, WY, TD, ML—contributed equally to this

research. Here are the specific efforts of each author. JL, WY, TD, ML made substantial contributions to conception and design, analysis and interpretation of data, drafting the manuscript and revising it critically for important intellectual content. LZ made substantial contributions to conception and design. All authors read and gave final approval of the version to be published.

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484 **Table 1. Participants' personal and job characteristics**

	N (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction N (%)	Satisfaction N (%)		
		473 (64.8)	257 (35.2)		
Sex				1.448	0.229
Male	407 (55.8)	256 (62.9)	151 (37.1)		
Female	323 (44.2)	217 (67.2)	106 (32.8)		
Education level				4.565	0.207
Junior College degree	11 (1.5)	4 (36.4)	7 (63.6)		
Bachelor's degree	203 (27.8)	128 (63.1)	75 (36.9)		
Master's degree	331 (45.3)	218 (65.9)	113 (34.1)		
Doctor's degree	185 (25.3)	123 (66.5)	62 (33.5)		
Position				6.800	0.147
Director of a clinical department	51 (7.0)	32 (62.7)	19 (37.3)		
Director of a medical technology department	4 (0.5)	2 (50.0)	2 (50.0)		
Doctor	637 (87.3)	420 (65.9)	217 (34.1)		
Researcher	2 (0.3)	0 (0.0)	2 (100.0)		
Unspecified staff	36 (4.9)	19 (52.8)	17 (47.2)		
Professional title				12.674	0.005
Junior	249 (34.1)	164 (65.9)	85 (34.1)		
Intermediate	302 (41.4)	204 (67.5)	98 (32.5)		
Associate senior	127 (17.4)	83 (65.4)	44 (34.6)		
Senior	52 (7.1)	22 (42.3)	30 (57.7)		
Department				8.213	0.042
Others	84 (11.5)	51 (60.7)	33 (39.3)		
Medical technology	46 (6.3)	25 (54.3)	21 (45.7)		
Internal medicine	319 (43.7)	224 (70.2)	95 (29.8)		
Surgery	281 (38.5)	173 (61.6)	108 (38.4)		

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486 **Table 2. Working conditions and participants' job satisfaction**

	N (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction N (%)	Satisfaction N (%)		
		473 (64.8)	257 (35.2)		
Work hours per week (hours)				16.935	0.002
≤40	90 (12.3)	44 (48.9)	46 (51.1)		
41-55	277 (37.9)	185 (66.8)	92 (33.2)		
56-70	282 (38.6)	190 (67.4)	92 (32.6)		
71-85	56 (7.7)	42 (75.0)	14 (25.0)		
≥86	25 (3.4)	12 (48.0)	13 (52.0)		
Whether the work within working hours met hospital requirements				13.846	0.008
Can	253 (34.7)	161 (63.6)	92 (36.4)		
Mostly can	367 (50.3)	224 (61.0)	143 (39.0)		
Mostly cannot	68 (9.3)	55 (80.9)	13 (19.1)		
Cannot	20 (2.7)	15 (75.0)	5 (25.0)		
Hard to say	22 (3.0)	18 (81.8)	4 (18.2)		
Life stress				20.524	<0.0001
Very light	2 (0.3)	2 (100.0)	0 (0.0)		
Relatively light	6 (0.8)	3 (50.0)	3 (50.0)		
Moderate	153 (21.0)	80 (52.3)	73 (47.7)		
Relatively great	362 (49.6)	234 (64.6)	128 (35.4)		
Very great	207 (28.4)	154 (74.4)	53 (25.6)		
Work stress					
Very light	0 (0.0)	0 (0.0)	0 (0.0)	39.135	<0.0001
Relatively light	3 (0.4)	0 (0.0)	3 (100.0)		
Moderate	88 (12.1)	37 (42.0)	51 (58.0)		
Relatively great	358 (49.0)	225 (62.8)	133 (37.2)		
Very great	281 (38.5)	211 (75.1)	70 (24.9)		
Whether current work stress increased compared to that in the past year				20.777	<0.0001
Yes	576 (78.9)	392 (68.1)	184 (31.9)		
No	73 (10.0)	30 (41.1)	43 (58.9)		
Hard to say	81 (11.1)	51 (63.0)	30 (37.0)		
Reflection of great work stress					
Work intensity	480 (65.8)	341 (71.0)	139 (29.0)	23.979	<0.0001
Long work time	421 (57.7)	303 (72.0)	118 (28.0)	22.459	<0.0001
High expectations of patients	341 (46.7)	230 (67.4)	111 (32.6)	1.976	0.160
High job risks	403 (55.2)	291 (72.2)	112 (27.8)	21.678	<0.0001
Poor patient-doctor relationships	396 (54.2)	277 (69.9)	119 (30.1)	10.083	0.001
Poor colleague relationships	42 (5.8)	33 (78.6)	9 (21.4)	3.708	0.054
Fierce competition for promotion	310 (42.5)	223 (71.9)	87 (28.1)	12.045	0.001
Poor social evaluations	205 (28.1)	162 (79.0)	43 (21.0)	25.303	<0.0001
Social misunderstandings	302 (41.8)	208 (68.2)	97 (31.8)	2.658	0.103

Whether departments once organized a community health lecture				1.542	0.214
No	465 (63.7)	309 (66.5)	156 (33.5)		
Yes	265 (36.3)	164 (61.9)	101 (38.1)		
Whether departments once participated in a volunteer medical consultation				0.213	0.644
No	318 (43.6)	209 (65.7)	109 (34.3)		
Yes	412 (56.4)	264 (64.1)	148 (35.9)		

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488 **Table 3. Patient-related issues and job satisfaction**

	N (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction N (%)	Satisfaction N (%)		
		473 (64.8)	257 (35.2)		
Which types of patients should seek medical treatment in tertiary A public hospitals (MCQ*)					
All types	301 (41.2)	182 (60.5)	119 (39.5)	4.209	0.040
Chronic diseases	165 (22.6)	98 (59.4)	67 (40.6)	2.726	0.099
Rare diseases	389 (53.3)	258 (66.3)	131 (33.7)	0.854	0.355
Common diseases	171 (23.4)	105 (61.4)	66 (38.6)	1.126	0.289
Acute diseases	321 (44.0)	211 (65.7)	110 (34.3)	0.221	0.638
Difficult-to-diagnose diseases	484 (66.3)	321 (66.3)	163 (33.7)	1.470	0.225
Rehabilitation	71 (9.7)	45 (63.4)	26 (36.6)	0.069	0.793
Serious diseases	453 (62.1)	294 (64.9)	159 (35.1)	0.006	0.939
Which types of patients doctors treated in most work hours (MCQ*)					
Chronic diseases	496 (67.9)	321 (64.7)	175 (35.3)	0.004	0.950
Rare diseases	82 (11.2)	46 (56.1)	36 (43.9)	3.063	0.080
Common diseases	606 (83.0)	399 (65.8)	207 (34.2)	1.715	0.190
Acute diseases	140 (19.2)	87 (62.1)	53 (37.9)	0.534	0.465
Difficult-to-diagnose diseases	190 (26.0)	114 (60.1)	76 (40.0)	2.588	0.108
Rehabilitation	81 (11.1)	52 (64.2)	29 (35.8)	0.014	0.905
Serious diseases	150 (20.5)	87 (58.0)	63 (42.0)	3.821	0.051
Seeking medicine	301 (41.2)	221 (73.4)	80 (26.6)	16.713	<0.0001
Whether doctors were satisfied with types of patients they treated				49.153	<0.0001
Satisfied	374 (51.2)	198 (52.9)	176 (47.1)		
Not satisfied	241 (33.0)	192 (79.7)	49 (20.3)		
Hard to say	115 (15.8)	83 (72.2)	32 (27.8)		
Which types of patients doctors expected (MCQ*)					
Chronic diseases	267 (36.6)	162 (60.7)	105 (39.3)	3.133	0.077
Rare diseases	338 (46.3)	224 (66.3)	114 (33.7)	0.603	0.438
Common diseases	380 (52.1)	228 (60.0)	152 (40.0)	7.987	0.005
Acute diseases	196 (26.8)	143 (73.0)	53 (27.0)	7.830	0.005
Difficult-to-diagnose diseases	460 (63.0)	305 (66.3)	155 (33.7)	1.243	0.265
Rehabilitation	69 (9.5)	43 (62.3)	26 (37.7)	0.205	0.651
Serious diseases	348 (47.7)	238 (68.4)	110 (31.6)	3.770	0.052
Seeking medicine	62 (8.5)	44 (71.0)	18 (29.0)	1.132	0.287
Which types of patients should seek medical treatment in the community health system (MCQ*)					
Chronic diseases	487 (66.7)	322 (66.1)	165 (33.9)	1.125	0.289
Rare diseases	27 (3.7)	15 (55.6)	12 (44.4)	1.049	0.306
Common diseases	556 (76.2)	360 (64.7)	196 (35.3)	0.002	0.963
Acute diseases	33 (4.5)	19 (57.6)	14 (42.4)	0.790	0.374

Difficult-to-diagnose diseases	30 (4.1)	23 (76.7)	7 (23.3)	1.933	0.164
Rehabilitation	368 (50.4)	251 (68.2)	117 (31.8)	3.787	0.052
Serious diseases	23 (3.2)	15 (65.2)	8 (34.8)	0.002	0.966
Seeking medicine	518 (71.0)	343 (66.2)	175 (33.8)	1.580	0.209
Evaluation of patients' medical expenses in tertiary A hospitals				8.352	0.079
Very cheap	28 (3.8)	24 (85.7)	4 (14.3)		
Relatively cheap	35 (4.8)	26 (74.3)	9 (25.7)		
Moderate	284 (38.9)	176 (62.0)	108 (38.0)		
Relatively expensive	334 (45.8)	213 (63.8)	121 (36.2)		
Very expensive	49 (6.7)	34 (69.4)	15 (30.6)		
Evaluation of the extent patients respect doctors				44.764	<0.0001
Not respect	13 (1.8)	11 (84.6)	2 (15.4)		
Relatively not respect	43 (5.9)	36 (83.7)	7 (16.3)		
Moderate	354 (48.5)	260 (73.4)	94 (26.6)		
Relatively respect	284 (38.9)	145 (51.1)	139 (48.9)		
Respect	36 (4.9)	21 (58.3)	15 (41.7)		

Asterisk (*): MCQ means multiple-choice question. Participants can choose more than one option in this question.

492 **Table 4. Logistic regression analysis of job satisfaction and its influencing factors**

Parameter	Estimate	P-value	OR	95% Wald confidence interval	
				Lower limit	Upper limit
Whether doctors were satisfied with types of patients they treated					
Satisfied	0.876	0.0007	2.401	1.447	3.982
Not satisfied	-0.244	0.408	0.784	0.440	1.397
Hard to say	Ref	Ref	Ref	Ref	Ref
Evaluation of the extent patients respect doctors					
Not respect	-1.050	0.261	0.350	0.056	2.187
Relatively not respect	-0.831	0.166	0.436	0.134	1.412
Moderate	-0.612	0.136	0.542	0.242	1.213
Relatively respect	0.223	0.573	1.256	0.568	2.776
Respect	Ref	Ref	Ref	Ref	Ref
Whether work intensity reflected work stress					
No	0.527	0.009	1.695	1.143	2.512
Yes	Ref	Ref	Ref	Ref	Ref
Whether a poor social evaluation reflected work stress					
No	0.813	0.0002	2.254	1.466	3.466
Yes	Ref	Ref	Ref	Ref	Ref
Work stress					
Very light	—	—	—	—	—
Relatively light	13.763	0.986	>999.999	<0.001	>999.999
Moderate	1.034	0.001	2.813	1.553	5.096
Relatively great	0.061	0.763	1.063	0.714	1.584
Very great	Ref	Ref	Ref	Ref	Ref
Whether the work within work hours met hospital requirements					
Can	0.498	0.410	1.645	0.504	5.366
Mostly can	0.788	0.187	2.198	0.683	7.080
Mostly cannot	-0.250	0.711	0.779	0.207	2.926
Cannot	0.585	0.482	1.795	0.352	9.159
Hard to say	Ref	Ref	Ref	Ref	Ref
Whether working long hours reflected work stress					
No	0.303	0.111	1.354	0.933	1.964
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with common diseases were the population doctors expected					
No	-0.415	0.025	0.660	0.459	0.945
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with acute diseases were the population doctors expected					
No	0.360	0.084	1.434	0.953	2.158
Yes	Ref	Ref	Ref	Ref	Ref
Professional title					
Junior	-0.916	0.031	0.400	0.197	0.811
Intermediate	-0.761	0.011	0.467	0.234	0.933
Associate senior	-0.723	0.031	0.485	0.230	1.022
Senior	Ref	Ref	Ref	Ref	Ref

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Supplementary Table 1. Multicollinearity analysis

Variable	Tolerance	Variance Inflation Factor
Sex	0.815	1.227
Education level	0.763	1.310
Position	0.702	1.425
Professional title	0.583	1.716
Department	0.762	1.313
Work hours per week (hours)	0.806	1.240
Whether the work within work hours met hospital requirements	0.886	1.129
Life stress	0.595	1.680
Work stress	0.473	2.116
Whether current work stress increased compared to that in the past year	0.737	1.356
Whether work intensity reflected work stress	0.717	1.394
Whether working long hours reflected work stress	0.741	1.350
Whether high expectations of patients reflected work stress	0.794	1.259
Whether high job risks reflected work stress	0.718	1.393
Whether a poor patient-doctor relationship reflected work stress	0.733	1.365
Whether a poor colleague relationship reflected work stress	0.768	1.303
Whether fierce competition of promotion reflected work stress	0.805	1.242
Whether a poor social evaluation reflected work stress	0.729	1.373
Whether social misunderstandings reflected work stress	0.697	1.435
Whether departments once organized a community health lecture	0.679	1.473
Whether departments once participated in a volunteer medical consultation	0.657	1.523
Whether patients with any kinds of diseases should seek medical treatment in tertiary A public hospitals	0.587	1.703
Whether patients with chronic diseases should seek medical treatment in tertiary A public hospitals	0.508	1.969
Whether patients with rare diseases should seek medical treatment in tertiary A public hospitals	0.440	2.271
Whether patients with common diseases should seek medical treatment in tertiary A public hospitals	0.584	1.712
Whether patients with acute diseases should seek medical treatment in tertiary A public hospitals	0.531	1.883
Whether patients with difficult-to-diagnose diseases should seek medical treatment in tertiary A public hospitals	0.370	2.703
Whether patients with rehabilitation should seek medical treatment in tertiary A public hospitals	0.599	1.669
Whether patients with serious diseases should seek medical treatment in tertiary A public hospitals	0.383	2.609
Whether patients with chronic diseases were the most doctors treated in work hours	0.675	1.481
Whether patients with rare diseases were the most doctors treated in	0.656	1.525

work hours		
Whether patients with common diseases were the most doctors treated in work hours	0.587	1.704
Whether patients with rare diseases were the most doctors treated in work hours	0.747	1.338
Whether patients with difficult-to-diagnose diseases were the most doctors treated in work hours	0.622	1.608
Whether patients with rehabilitation diseases were the most doctors treated in work hours	0.689	1.451
Whether patients with serious diseases were the most doctors treated in work hours	0.600	1.666
Whether patients seeking medicine were the most doctors treated in work hours	0.576	1.736
Whether doctors were satisfied with types of patients they treated	0.787	1.270
Whether patients with chronic diseases were the population doctors expected	0.630	1.587
Whether patients with rare diseases were the population doctors expected	0.678	1.476
Whether patients with common diseases were the population doctors expected	0.655	1.527
Whether patients with acute diseases were the population doctors expected	0.770	1.298
Whether patients with difficult-to-diagnose diseases were the population doctors expected	0.661	1.513
Whether patients with rehabilitation diseases were the population doctors expected	0.656	1.523
Whether patients with serious diseases were the population doctors expected	0.601	1.665
Whether patients seeking medicine were the population doctors expected	0.810	1.234
Whether patients with chronic diseases should seek medical treatment in the community health system	0.721	1.387
Whether patients with rare diseases should seek medical treatment in the community health system	0.751	1.332
Whether patients with common diseases should seek medical treatment in community health system	0.822	1.216
Whether patients with acute diseases should eek medical treatment in the community health system	0.785	1.274
Whether patients with difficult-to-diagnose diseases should seek medical treatment in the community health system	0.697	1.435
Whether patients with rehabilitation diseases should seek medical treatment in the community health system	0.705	1.419
Whether patients with serious diseases should seek medical treatment in the community health system	0.639	1.565

Whether patients seeking medicine should seek medical treatment in the community health system	0.714	1.400
Evaluation of patients' medical expenses in tertiary A hospitals	0.859	1.164
Evaluation of the extent patients respect doctors	0.789	1.267

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-6
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-7
		(*b*) Describe any methods used to examine subgroups and interactions	6-7
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-7
		(*e*) Describe any sensitivity analyses	6-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	5
		(c) Consider use of a flow diagram	5
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7-8
		(b) Indicate number of participants with missing data for each variable of interest	5
Outcome data	15*	Report numbers of outcome events or summary measures	7
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	8-10
		(*b*) Report category boundaries when continuous variables were categorized	8-10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for	8-10

		a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	8-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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A cross-sectional survey on job satisfaction and its associated factors among doctors in tertiary public hospitals in Shanghai, China

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A cross-sectional survey on job satisfaction and its associated factors among doctors in tertiary public hospitals in Shanghai, China

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Abstract

Objectives: Doctors in public hospitals in China face considerable pressure and excessive workloads, which are likely to predispose them to job dissatisfaction. We explored the job satisfaction of doctors and examined the influence of diverse sociodemographic characteristics.

Design: This was a cross-sectional study.

Setting: Eleven tertiary public hospitals in Shanghai, China.

Participants: The questionnaire was designed based on the 5th National Health Service General Research, which was based on the Minnesota Satisfaction Questionnaire. Questionnaires were administered to 897 doctors randomly (using random number tables), and 730 were returned completed (response rate = 81.4%). Doctors who volunteered and provided informed, written consent participated.

Primary outcome measures: The dependent variable was doctors' job satisfaction.

Results: Statistical analyses were conducted using SPSS and SAS. Overall, 64.8% of participants were dissatisfied with their jobs. Factors that were statistically significant to doctors' job satisfaction in the univariate analysis were entered into the logistic regression analysis, including doctors' professional title, department, work hours, work requirements (reflected as the number of patients they diagnosed and treated monthly), life and work stress, and the types of patients that doctors treated or expected to treat. The results of the logistic regression analysis suggested that doctors' job satisfaction was related to their professional title, types of patients that doctors treated or expected to treat, as well as their work stress.

Conclusions: There is an urgent need for public hospitals in China to establish a more reasonable promotion and management system for doctors, encourage patients to accept the two-way referral, pay more attention to less-experienced staff, and help doctors release their work stress.

Keywords: job satisfaction; doctor; hospital; China

Strengths and limitations of this study

- We tried to suggest ways to improve doctors' job satisfaction and promote becoming a doctor in China.
- We provided a valuable reference for others interested in doctors' job satisfaction and working conditions in China.
- We provided quantitative data concerning doctors' working conditions.
- Our research findings are only representative of doctors in tertiary A public hospitals in China.
- Income or income-workload balance was not explored in this study, which is a major limitation.

Background

Work-related problems of doctors are growing global concerns, especially doctors' job satisfaction[1]. Job satisfaction comprises issues such as burnout[2 3], mental health[4], work-family balance[5], and quality of care[6]. Several studies have explored job satisfaction, including its diverse dimensions[2]; its influencing factors[7]; and interrelationships between burnout[3], work stress[8 9], mental health[4] and job satisfaction among doctors, nurses, and medical staff in diverse departments, regions and countries[10]. Several studies in different countries have also indicated that income and income-workload balance are related to doctors' job satisfaction[11-13].

Scholars from different countries such as the United States, the United Kingdom, and Germany have tried to deal with problems concerning job dissatisfaction[14-16]. For example, scholars in the United States noted that workload, work meaningfulness, relational needs, tolerance, and risk-taking attitudes were associated with job satisfaction[14]. Researchers in the United Kingdom indicated that whether physicians can fully use their training was a key factor influencing their job satisfaction[15]. Scholars in Germany paid more attention to foreign-national physicians and suggested that human relations and social status were related to their job satisfaction[16]. In addition, job characteristics[9 10 17-21] and personal factors[22-25] have been found to affect job satisfaction.

Further, doctors themselves pay great attention to job satisfaction. Doctors worldwide fight for their own rights to improve job satisfaction, working condition, professional accomplishments, and career development. For example, doctors in

Poland[26] and the Czech Republic[27] have had conflicts with their respective governments regarding overwork. Fortunately, doctors in many countries and regions have succeeded in this fight, which ultimately improves their job satisfaction, work efficiency, and care quality[28].

Moreover, healthcare reform is a vital component of doctors' job satisfaction and working conditions, and China is no exception. In Chinese healthcare reform, the government pays considerable attention to reducing medication costs[29]. Hospitals are expected to sell drugs to patients without adding a 15% profit, which may decrease the hospital's income[30]. Other policies such as controlling medication fees per visit and the cost of medical insurance have reduced doctors' decision-making power. Consequently, hospital management may force doctors to work overtime to augment or maintain hospital income if there is not enough government compensation[31]. Moreover, doctors had to change their behaviors to fulfill hospital income indicators. In China, over 4.5 million doctors are under increasing pressures to see more patients, meet increased administrative requirements, and keep up with government regulations[32]. Moreover, the lives of doctors are threatened in hospitals owing to poor doctor-patient relationships[33]. As doctors are overworked, underpaid, and under threat, some scholars have wondered who will be the next doctors in China[34].

Therefore, the main purpose of this study was to suggest ways to promote the development of more doctors in China and improve the condition of doctors. We determined what factors affect doctors' job satisfaction in China and provide practical recommendations to improve Chinese doctors' job satisfaction and working

conditions.

Methods

Participants

Between June 18 and September 27, 2013, a cross-sectional survey of doctors' job satisfaction was conducted in Shanghai, China. Using random number tables, we selected eleven tertiary public hospitals in Shanghai. Questionnaires were administered to 1,000 doctors in these hospitals. All participants were also chosen through random number tables, which were based on doctors' job number. Of the 1,000 participants, 897 were willing to participate, and 103 doctors were excluded from this study because of their unwillingness to participate. Of these, 730 were returned complete (valid response rate = 81.4%). Doctors who volunteered and provided informed, written consent participated. Researchers addressed doctors' queries and doubts regarding the questionnaire as needed.

Instrument Development and Validation

The questionnaire was designed to examine doctors' working conditions and job satisfaction. The questionnaire was designed based on the 5th National Health Service General Research by the National Health and Family Planning Commission of the People's Republic of China[35]. The general survey of the National Health Service included job satisfaction of medical staff. It was a rigorously developed instrument, based on the well-known and widely used Minnesota Satisfaction Questionnaire[36]. Its content validity was validated through an expert panel discussion, which included 5 experts. To determine the internal consistency of this questionnaire, Cronbach's α

coefficient was calculated, which was 0.65. The Kaiser-Meyer-Olkin (KMO) test was used as a screening test for factorability, which was 0.703 ($p < 0.001$), indicating acceptable validity.

We collected data on sociodemographic variables such as age, sex, education level, position, professional title, and department. Positions comprised directors, doctors, researchers, and unspecified staff. The unspecified staff members were doctoral students studying and working in these hospitals. There were some structured questions about types of patients, including types of patients that doctors thought should be treated in different healthcare institutions, doctors' satisfaction with the types of patients they were treating, and what types of patients they expected to treat. In addition, we asked about doctors' work time, life stress, work stress, and the sources of work stress. The sources of work stress included work intensity, long hours, patients' lofty expectations, job risks, poor patient-doctor relationships, poor colleague relationships, competition for promotion, poor social evaluations, and societal misunderstandings. Work intensity reflected the quantum of doctors' work, which was mainly evaluated by the number of patients that doctors diagnosed and treated (including surgery). Poor social evaluations reflected doctors' reputation among patients, which considered doctors' professional abilities and personal characteristics. We also asked doctors to rate their relationships with patients and evaluate patients' medical expenses. Questions about working and life stress, and doctor-patient relationships were measured using a 5-point Likert scale (*not respectful*, *relatively not respectful*, *moderate*, *relatively respectful*, and *very*

respectful). Doctors' job satisfaction was the dependent variable in this study. Because job satisfaction and dissatisfaction were evaluated from multiple aspects, doctors had to make an evaluation of their job based on their work time, life stress, work stress, and the sources of work stress. Based on the definition by Gothe et al.[37], if the individual is happy with their job after considering all the above factors, they could evaluate their job as satisfactory; otherwise, they could evaluate it as dissatisfactory.

Ethical Approval

The study protocol was approved by the ethics committee of the Second Military Medical University. We protected the participants' confidentiality. All participants provided written informed consent.

Statistical Analyses

All data were entered into Epidata version 3.1 and analyzed using SPSS version 19.0 and SAS version 8.0. Sociodemographic data were described using frequencies and percentages. Chi-square tests were employed to test the differences in job satisfaction among doctors with different personal characteristics and other factors. A binary logistic regression analysis was further used to verify the influence of factors on doctors' job satisfaction. In the logistic regression analysis, the dependent variable was doctors' job satisfaction. Independent variables entered into the logistic regression analysis were based on the univariate analysis results that were all significantly related to doctors' job satisfaction. We employed the stepwise selection method, with inclusion criteria of 0.10 and exclusion criteria of 0.15. We also

employed a multicollinearity analysis to test collinearity. All tests were two-tailed and $p < 0.05$ was considered significant.

Patient and Public Involvement

We declare that no patients or public were involved in this study.

Results

Characteristics, Working Condition, and Job Satisfaction

Overall, 64.8% of participants were dissatisfied with their jobs. Participants' personal and job characteristics are shown in Table 1.

Table 1. Participants' personal and job characteristics

Working conditions and participants' job satisfaction are shown in Table 2. Nearly 88% of the participants worked more than 40 hours a week. It was found that 85% of the doctors could basically meet the hospitals' working requirements, which were reflected as the number of patients they diagnosed and treated monthly. Most reported work and life stress, which had increased in the last year, and was due to working intensity, long hours, and job risks. In addition, about one-third of doctors reported that their departments organized a community health lecture, and more than half of the departments participated in a volunteer medical consultation.

Table 2. Working conditions and participants' job satisfaction

Considering the types of patients, participants believed patients with difficult-to-diagnose diseases, serious diseases, and rare diseases should seek medical treatment in tertiary A hospitals. Most participants treated patients with common diseases, chronic diseases, and those seeking medicine; only about half of them were

satisfied with the type of patients they met, which differed from whom they were expecting to treat more often. Participants felt that many of these patients should seek medical treatment in the community health system, especially patients with common and chronic diseases, and those seeking medicines. Further, about half of the participants thought patients' medical expenses were costly. Lastly, less than half of the participants felt respected by their patients (Table 3).

Table 3. Patient-related issues and job satisfaction

Univariate Analysis of Job Satisfaction and its Influencing Factors

Using chi-square tests, the relationships between job satisfaction and other factors were examined. Results indicated that several factors significantly influenced doctors' job satisfaction (all p-values < 0.05), including the following: professional title ($\chi^2 = 12.674$), department ($\chi^2 = 8.213$), work hours every week ($\chi^2 = 16.935$), whether the work within working hours met hospital requirements ($\chi^2 = 13.846$), life stress ($\chi^2 = 20.524$), work stress ($\chi^2 = 39.135$), whether current work stress increased compared to that in the past year ($\chi^2 = 20.777$), whether work intensity reflected work stress ($\chi^2 = 23.979$), whether working long hours reflected work stress ($\chi^2 = 22.459$), whether high jobs risks reflected work stress ($\chi^2 = 21.678$), whether a poor patient-doctor relationship reflected work stress ($\chi^2 = 1.083$), whether competition for promotion reflected work stress ($\chi^2 = 12.045$), whether a poor social evaluation reflected work stress ($\chi^2 = 25.303$), whether patients should seek medical treatment in tertiary A hospitals ($\chi^2 = 4.209$), whether patients seeking medicine were the most common type doctors treated ($\chi^2 = 16.713$), whether doctors were satisfied with the

type of patients they treated (χ^2 = 49.153), whether patients with common diseases were the population doctors expected (χ^2 = 7.987), whether patients with acute diseases were the population doctors expected (χ^2 = 7.830), and the extent patients respected doctors (χ^2 = 44.764) (Tables 1–3).

Logistic Regression Analysis of Job Satisfaction and its Influencing Factors

Variables that were significant to doctors' job satisfaction in the univariate analysis were included in the binary logistic regression analysis. To testify the collinearity among variables, a multicollinearity analysis was conducted. If tolerance is < 0.1 or the variance inflation factor (VIF) is > 5, collinearity exists. The multicollinearity analysis indicated that collinearity did not exist (Supplementary Table 1).

As shown in Table 4, 9 factors were entered into the logistic regression model. Doctors who were satisfied with the types of patients they treated were more likely to be satisfied with their job compared to those who were not satisfied. Doctors who did not consider work intensity or poor social evaluation as reflective of their work stress had more job satisfaction than did their counterparts. Doctors who felt moderate work stress felt more satisfied with their job compared with those with great work stress. Doctors who had an expectation of treating patients with common diseases were more satisfied with their jobs. Lastly, doctors with senior professional titles were more satisfied with their job compared with doctors with lower-level titles.

Table 4. Logistic regression analysis of job satisfaction and its influencing factors

Discussion

Doctors' job satisfaction was influenced by their professional title, patient composition, and work stress. Some factors like department, work hours, patients' respect, and life stress were also related to doctors' job satisfaction.

First, unlike some studies in other countries and regions, demographic characteristics (e.g., sex and education background) were not influencing factors of job satisfaction[38 39]. Only doctors' professional title played a role, which was supported by other studies in China[5] and Canada[40]. Junior doctors were less satisfied with their job, which may be attributed to many other factors. Because doctors' income was related to their professional title[41], the annual income of junior doctors was always lower than that of senior doctors. However, studies have proposed that income positively influences doctors' job satisfaction[2 5 20 42]. In addition, a study in the United Kingdom noted that young staff may fail to fully use their training, which could foster low satisfaction[15]. This can also be explained by opportunities to use one's abilities and personal accomplishments during daily work, which were other aspects impeding young staff from enjoying job satisfaction[7]. Moreover, junior doctors in China face additional difficulties, including an unfair promotion system[43]. Furthermore, the new policy about specialist standardization training places more pressure on young staff, since it requires doctors to do an additional 2–4 years of specialist training after completing 3 years of resident standardization training[44]. During this process, young doctors may become unsatisfied with their income and their inability to support their families, which, in turn, promotes further job dissatisfaction.

Second, patient composition was a significant factor influencing doctors' job satisfaction. Around 51.2% of the doctors were satisfied with the type of patients they treated; however, 52.1% of the doctors mostly treated patients with common diseases every day. The low satisfaction seemed to reflect the gap between their expectations and the reality. Given that doctors in tertiary A public hospitals have the best professional abilities and hope to deal with the most difficult and complicated diseases, they expect to treat patients with difficult-to-diagnose diseases. However, unlike the two-way referral system in many developed countries (e.g., the United States), patients in China can choose the health institution they prefer[45]. This causes overcrowding in tertiary A public hospitals[46], regardless of disease type. In fact, many patients with common, mild, or chronic diseases do not need to visit tertiary A public hospitals, as this wastes high-quality medical resources. Under these circumstances, doctors who wish to solve difficult-to-diagnose cases feel disappointed and dissatisfied with their work[14]. To solve this problem, hospital patient flow logistics should be controlled[47]. Encouraging patients and doctors to accept the two-way referral is vital; however, the level of trust between doctors and patients is also critical. Moreover, it should be noted that inadequate time spent treating difficult-to-diagnose diseases has a negative effect on doctors' skill development, which can also cause doctors' job dissatisfaction. Policymakers and hospital administrators should provide more opportunities to doctors expecting more difficult-to-diagnose patients, especially junior doctors.

Third, work stress was related to job satisfaction, which supported a past study[5].

However, we also found that relative work stress (i.e., comparing work stress to that in the past year) more significantly predicted job satisfaction than did present work stress. Doctors who felt greater relative work stress were more likely to be dissatisfied with their job than their counterparts. In addition, the factors that doctors consider as reflective of work stress, especially work intensity and social evaluation, require attention. Doctors working in tertiary A public hospitals usually undertake many clinical tasks; for example, because of the excess of patients, doctors have to diagnose and treat them as fast as possible, which limits doctors' ability to take breaks[48]. Moreover, several doctors have been reported to die suddenly, possibly because of the work intensity[49]. Similar studies in other countries have also stated that work intensity negatively affects job satisfaction[14 38]. Moreover, improving their social evaluation may improve doctors' job satisfaction. At present, doctors in China do not have a good reputation because of some doctors pursuing personal economic interests by prescribing unnecessary medicine or tests for patients[50]. It must be noted that there are many other doctors who do not resort to such unethical practices; however, they also become victims of this stigmatization. Our society should maintain an objective and impartial attitude towards most doctors and supervise those with a poor reputation.

Fourth, doctors' long work hours require attention. Working overtime has caused low job satisfaction worldwide, such as in Britain[51], Spain[52], and Switzerland[42]. Our finding was similar. Although the European Working Time Directive ruled that junior doctors should work no more than 48 hours per week[53], this was unrealistic in China. Doctors have to work overtime, which often limits their family time and spare time.

However, a study proposed that work-private hours also play a key role in job satisfaction[9]. In addition, in Chinese hospitals, doctors' payment is based on their performance, indicating that meeting job requirements may be more critical than working long hours. Moreover, performance is critical for promotion, especially for junior doctors. Therefore, there is an urgent need to shorten doctors' weekly work hours and change the current promotion and income structure, which may promote increased job satisfaction[54].

Fifth, it is reasonable to assume that if doctors feel respected by patients, they will be more satisfied with their work. Respect from patients indicates that their professional abilities, personal characteristics, and good reputation are recognized. All of these good aspects would accelerate doctors' enthusiasms of their work, which then reflected as job satisfaction. However, due to the overcrowding of patients in tertiary A public hospitals, patients spend a long time waiting to register, pay, and fill prescriptions compared to the short time meeting the doctors. This unreasonable phenomenon has reduced patients' satisfaction and their respect for doctors, and sometimes even results in violence against doctors[55]. Therefore, experiencing a poor patient-doctor relationship and violence from patients might lead to doctors' job dissatisfaction. To address this concern and improve the patient-doctor relationship, the number of patients visiting tertiary A public hospitals should be decreased. If patients with common or minor diseases are willing and encouraged to seek medical treatment in the community healthcare system, doctors at tertiary A hospitals can spend more time diagnosing, treating, and communicating with patients, while

maintaining a positive and patient attitude[56].

Lastly, other life stress is also related to job satisfaction, and problems such as depression and burnout require consideration[57]. Work-family conflict should also be addressed to avoid job dissatisfaction[5]. Moreover, doctors' professional title and department might factor into their job satisfaction. Junior doctors might experience more life stress due to supporting their families; therefore, these doctors may require additional support. Doctors in different departments may also enjoy various extensions of job satisfaction[21], indicating that hospital administrators should improve the working conditions to various degrees according to the doctors' departments.

There are two limitations to this study. First, due to doctors' unwillingness to answer questions about certain personal information, information on age distribution and income were not obtained, which made it impossible to explore the effects of these on job satisfaction. Second, this survey was only conducted in eleven tertiary A public hospitals in Shanghai, which limits generalizability. Future studies should include more hospitals and more possible factors.

Conclusions

In conclusion, most doctors were not satisfied with their jobs in Shanghai, China, and this was mainly influenced by their professional title, patient composition, and work stress. To address this problem, policymakers and hospital administrators should establish the two-way referral system, improve the current promotion and income structure, pay more attention to less-experienced staff, and help doctors release their work stress.

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Authors' contributions

This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must point out that the four authors—JL, WY, TD, ML—contributed equally to this research. Here are the specific efforts of each author. JL, WY, TD, ML made substantial contributions to conception and design, analysis and interpretation of data, drafting the manuscript and revising it critically for important intellectual content. LZ made substantial contributions to conception and design. All authors read and gave final approval of the version to be published.

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521 **Table 1. Participants' personal and job characteristics**

		Job satisfaction			
	n (%)	**Dissatisfaction n (%)**	**Satisfaction n (%)**	**χ^2**	**P-value**
		473 (64.8)	257 (35.2)		
Sex				1.448	0.229
Male	407 (55.8)	256 (62.9)	151 (37.1)		
Female	323 (44.2)	217 (67.2)	106 (32.8)		
Education level				4.565	0.207
Junior College degree	11 (1.5)	4 (36.4)	7 (63.6)		
Bachelor's degree	203 (27.8)	128 (63.1)	75 (36.9)		
Master's degree	331 (45.3)	218 (65.9)	113 (34.1)		
Doctor's degree	185 (25.3)	123 (66.5)	62 (33.5)		
Position				6.800	0.147
Director of a clinical department	51 (7.0)	32 (62.7)	19 (37.3)		
Director of a medical technology department	4 (0.5)	2 (50.0)	2 (50.0)		
Doctor	637 (87.3)	420 (65.9)	217 (34.1)		
Researcher	2 (0.3)	0 (0.0)	2 (100.0)		
Unspecified staff	36 (4.9)	19 (52.8)	17 (47.2)		
Professional title				12.674	0.005
Junior	249 (34.1)	164 (65.9)	85 (34.1)		
Intermediate	302 (41.4)	204 (67.5)	98 (32.5)		
Associate senior	127 (17.4)	83 (65.4)	44 (34.6)		
Senior	52 (7.1)	22 (42.3)	30 (57.7)		
Department				8.213	0.042
Others	84 (11.5)	51 (60.7)	33 (39.3)		
Medical technology	46 (6.3)	25 (54.3)	21 (45.7)		
Internal medicine	319 (43.7)	224 (70.2)	95 (29.8)		
Surgery	281 (38.5)	173 (61.6)	108 (38.4)		

523 **Table 2. Working conditions and participants' job satisfaction**

	n (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction n (%)	Satisfaction n (%)		
		473 (64.8)	257 (35.2)		
Work hours per week (hours)				16.935	0.002
≤40	90 (12.3)	44 (48.9)	46 (51.1)		
41-55	277 (37.9)	185 (66.8)	92 (33.2)		
56-70	282 (38.6)	190 (67.4)	92 (32.6)		
71-85	56 (7.7)	42 (75.0)	14 (25.0)		
≥86	25 (3.4)	12 (48.0)	13 (52.0)		
Whether the work within working hours met hospital requirements				13.846	0.008
Can	253 (34.7)	161 (63.6)	92 (36.4)		
Mostly can	367 (50.3)	224 (61.0)	143 (39.0)		
Mostly cannot	68 (9.3)	55 (80.9)	13 (19.1)		
Cannot	20 (2.7)	15 (75.0)	5 (25.0)		
Hard to say	22 (3.0)	18 (81.8)	4 (18.2)		
Life stress				20.524	<0.0001
Very light	2 (0.3)	2 (100.0)	0 (0.0)		
Relatively light	6 (0.8)	3 (50.0)	3 (50.0)		
Moderate	153 (21.0)	80 (52.3)	73 (47.7)		
Relatively great	362 (49.6)	234 (64.6)	128 (35.4)		
Very great	207 (28.4)	154 (74.4)	53 (25.6)		
Work stress					
Very light	0 (0.0)	0 (0.0)	0 (0.0)	39.135	<0.0001
Relatively light	3 (0.4)	0 (0.0)	3 (100.0)		
Moderate	88 (12.1)	37 (42.0)	51 (58.0)		
Relatively great	358 (49.0)	225 (62.8)	133 (37.2)		
Very great	281 (38.5)	211 (75.1)	70 (24.9)		
Whether current work stress increased compared to that in the past year				20.777	<0.0001
Yes	576 (78.9)	392 (68.1)	184 (31.9)		
No	73 (10.0)	30 (41.1)	43 (58.9)		
Hard to say	81 (11.1)	51 (63.0)	30 (37.0)		
Reflection of great work stress					
Work intensity	480 (65.8)	341 (71.0)	139 (29.0)	23.979	<0.0001
Long work time	421 (57.7)	303 (72.0)	118 (28.0)	22.459	<0.0001
High expectations of patients	341 (46.7)	230 (67.4)	111 (32.6)	1.976	0.160
High job risks	403 (55.2)	291 (72.2)	112 (27.8)	21.678	<0.0001
Poor patient-doctor relationships	396 (54.2)	277 (69.9)	119 (30.1)	10.083	0.001
Poor colleague relationships	42 (5.8)	33 (78.6)	9 (21.4)	3.708	0.054
Fierce competition for promotion	310 (42.5)	223 (71.9)	87 (28.1)	12.045	0.001
Poor social evaluations	205 (28.1)	162 (79.0)	43 (21.0)	25.303	<0.0001
Social misunderstandings	302 (41.8)	208 (68.2)	97 (31.8)	2.658	0.103

Whether departments once organized a community health lecture				1.542	0.214
No	465 (63.7)	309 (66.5)	156 (33.5)		
Yes	265 (36.3)	164 (61.9)	101 (38.1)		
Whether departments once participated in a volunteer medical consultation				0.213	0.644
No	318 (43.6)	209 (65.7)	109 (34.3)		
Yes	412 (56.4)	264 (64.1)	148 (35.9)		

525 **Table 3. Patient-related issues and job satisfaction**

	n (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction n (%)	Satisfaction n (%)		
		473 (64.8)	257 (35.2)		
Which types of patients should seek medical treatment in tertiary A public hospitals (MCQ*)					
All types	301 (41.2)	182 (60.5)	119 (39.5)	4.209	0.040
Chronic diseases	165 (22.6)	98 (59.4)	67 (40.6)	2.726	0.099
Rare diseases	389 (53.3)	258 (66.3)	131 (33.7)	0.854	0.355
Common diseases	171 (23.4)	105 (61.4)	66 (38.6)	1.126	0.289
Acute diseases	321 (44.0)	211 (65.7)	110 (34.3)	0.221	0.638
Difficult-to-diagnose diseases	484 (66.3)	321 (66.3)	163 (33.7)	1.470	0.225
Rehabilitation	71 (9.7)	45 (63.4)	26 (36.6)	0.069	0.793
Serious diseases	453 (62.1)	294 (64.9)	159 (35.1)	0.006	0.939
Which types of patients doctors treated in most work hours (MCQ*)					
Chronic diseases	496 (67.9)	321 (64.7)	175 (35.3)	0.004	0.950
Rare diseases	82 (11.2)	46 (56.1)	36 (43.9)	3.063	0.080
Common diseases	606 (83.0)	399 (65.8)	207 (34.2)	1.715	0.190
Acute diseases	140 (19.2)	87 (62.1)	53 (37.9)	0.534	0.465
Difficult-to-diagnose diseases	190 (26.0)	114 (60.1)	76 (40.0)	2.588	0.108
Rehabilitation	81 (11.1)	52 (64.2)	29 (35.8)	0.014	0.905
Serious diseases	150 (20.5)	87 (58.0)	63 (42.0)	3.821	0.051
Seeking medicine	301 (41.2)	221 (73.4)	80 (26.6)	16.713	<0.0001
Whether doctors were satisfied with types of patients they treated				49.153	<0.0001
Satisfied	374 (51.2)	198 (52.9)	176 (47.1)		
Not satisfied	241 (33.0)	192 (79.7)	49 (20.3)		
Hard to say	115 (15.8)	83 (72.2)	32 (27.8)		
Which types of patients doctors expected (MCQ*)					
Chronic diseases	267 (36.6)	162 (60.7)	105 (39.3)	3.133	0.077
Rare diseases	338 (46.3)	224 (66.3)	114 (33.7)	0.603	0.438
Common diseases	380 (52.1)	228 (60.0)	152 (40.0)	7.987	0.005
Acute diseases	196 (26.8)	143 (73.0)	53 (27.0)	7.830	0.005
Difficult-to-diagnose diseases	460 (63.0)	305 (66.3)	155 (33.7)	1.243	0.265
Rehabilitation	69 (9.5)	43 (62.3)	26 (37.7)	0.205	0.651
Serious diseases	348 (47.7)	238 (68.4)	110 (31.6)	3.770	0.052
Seeking medicine	62 (8.5)	44 (71.0)	18 (29.0)	1.132	0.287
Which types of patients should seek medical treatment in the community health system (MCQ*)					
Chronic diseases	487 (66.7)	322 (66.1)	165 (33.9)	1.125	0.289
Rare diseases	27 (3.7)	15 (55.6)	12 (44.4)	1.049	0.306
Common diseases	556 (76.2)	360 (64.7)	196 (35.3)	0.002	0.963
Acute diseases	33 (4.5)	19 (57.6)	14 (42.4)	0.790	0.374

Difficult-to-diagnose diseases	30 (4.1)	23 (76.7)	7 (23.3)	1.933	0.164
Rehabilitation	368 (50.4)	251 (68.2)	117 (31.8)	3.787	0.052
Serious diseases	23 (3.2)	15 (65.2)	8 (34.8)	0.002	0.966
Seeking medicine	518 (71.0)	343 (66.2)	175 (33.8)	1.580	0.209
Evaluation of patients' medical expenses in tertiary A hospitals				8.352	0.079
Very cheap	28 (3.8)	24 (85.7)	4 (14.3)		
Relatively cheap	35 (4.8)	26 (74.3)	9 (25.7)		
Moderate	284 (38.9)	176 (62.0)	108 (38.0)		
Relatively expensive	334 (45.8)	213 (63.8)	121 (36.2)		
Very expensive	49 (6.7)	34 (69.4)	15 (30.6)		
Evaluation of the extent patients respect doctors				44.764	<0.0001
Not respect	13 (1.8)	11 (84.6)	2 (15.4)		
Relatively not respect	43 (5.9)	36 (83.7)	7 (16.3)		
Moderate	354 (48.5)	260 (73.4)	94 (26.6)		
Relatively respect	284 (38.9)	145 (51.1)	139 (48.9)		
Respect	36 (4.9)	21 (58.3)	15 (41.7)		

Asterisk (*): MCQ means multiple-choice question. Participants can choose more than one option in this question.

529 **Table 4. Logistic regression analysis of job satisfaction and its influencing factors**

Parameter	Estimate	P-value	OR	95% Wald confidence interval	
				Lower limit	Upper limit
Whether doctors were satisfied with types of patients they treated					
Satisfied	0.876	0.0007	2.401	1.447	3.982
Not satisfied	-0.244	0.408	0.784	0.440	1.397
Hard to say	Ref	Ref	Ref	Ref	Ref
Evaluation of the extent patients respect doctors					
Not respect	-1.050	0.261	0.350	0.056	2.187
Relatively not respect	-0.831	0.166	0.436	0.134	1.412
Moderate	-0.612	0.136	0.542	0.242	1.213
Relatively respect	0.223	0.573	1.256	0.568	2.776
Respect	Ref	Ref	Ref	Ref	Ref
Whether work intensity reflected work stress					
No	0.527	0.009	1.695	1.143	2.512
Yes	Ref	Ref	Ref	Ref	Ref
Whether a poor social evaluation reflected work stress					
No	0.813	0.0002	2.254	1.466	3.466
Yes	Ref	Ref	Ref	Ref	Ref
Work stress					
Very light	—	—	—	—	—
Relatively light	13.763	0.986	>999.999	<0.001	>999.999
Moderate	1.034	0.001	2.813	1.553	5.096
Relatively great	0.061	0.763	1.063	0.714	1.584
Very great	Ref	Ref	Ref	Ref	Ref
Whether the work within work hours met hospital requirements					
Can	0.498	0.410	1.645	0.504	5.366
Mostly can	0.788	0.187	2.198	0.683	7.080
Mostly cannot	-0.250	0.711	0.779	0.207	2.926
Cannot	0.585	0.482	1.795	0.352	9.159
Hard to say	Ref	Ref	Ref	Ref	Ref
Whether working long hours reflected work stress					
No	0.303	0.111	1.354	0.933	1.964
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with common diseases were the population doctors expected					
No	-0.415	0.025	0.660	0.459	0.945
Yes	Ref	Ref	Ref	Ref	Ref
Whether patients with acute diseases were the population doctors expected					
No	0.360	0.084	1.434	0.953	2.158
Yes	Ref	Ref	Ref	Ref	Ref
Professional title					
Junior	-0.916	0.031	0.400	0.197	0.811
Intermediate	-0.761	0.011	0.467	0.234	0.933
Associate senior	-0.723	0.031	0.485	0.230	1.022
Senior	Ref	Ref	Ref	Ref	Ref

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Supplementary Table 1. Multicollinearity analysis

Variable	Tolerance	Variance Inflation Factor
Sex	0.815	1.227
Education level	0.763	1.310
Position	0.702	1.425
Professional title	0.583	1.716
Department	0.762	1.313
Work hours per week (hours)	0.806	1.240
Whether the work within work hours met hospital requirements	0.886	1.129
Life stress	0.595	1.680
Work stress	0.473	2.116
Whether current work stress increased compared to that in the past year	0.737	1.356
Whether work intensity reflected work stress	0.717	1.394
Whether working long hours reflected work stress	0.741	1.350
Whether high expectations of patients reflected work stress	0.794	1.259
Whether high job risks reflected work stress	0.718	1.393
Whether a poor patient-doctor relationship reflected work stress	0.733	1.365
Whether a poor colleague relationship reflected work stress	0.768	1.303
Whether fierce competition of promotion reflected work stress	0.805	1.242
Whether a poor social evaluation reflected work stress	0.729	1.373
Whether social misunderstandings reflected work stress	0.697	1.435
Whether departments once organized a community health lecture	0.679	1.473
Whether departments once participated in a volunteer medical consultation	0.657	1.523
Whether patients with any kinds of diseases should seek medical treatment in tertiary A public hospitals	0.587	1.703
Whether patients with chronic diseases should seek medical treatment in tertiary A public hospitals	0.508	1.969
Whether patients with rare diseases should seek medical treatment in tertiary A public hospitals	0.440	2.271
Whether patients with common diseases should seek medical treatment in tertiary A public hospitals	0.584	1.712
Whether patients with acute diseases should seek medical treatment in tertiary A public hospitals	0.531	1.883
Whether patients with difficult-to-diagnose diseases should seek medical treatment in tertiary A public hospitals	0.370	2.703
Whether patients with rehabilitation should seek medical treatment in tertiary A public hospitals	0.599	1.669
Whether patients with serious diseases should seek medical treatment in tertiary A public hospitals	0.383	2.609
Whether patients with chronic diseases were the most doctors treated in work hours	0.675	1.481
Whether patients with rare diseases were the most doctors treated in	0.656	1.525

work hours		
Whether patients with common diseases were the most doctors treated in work hours	0.587	1.704
Whether patients with rare diseases were the most doctors treated in work hours	0.747	1.338
Whether patients with difficult-to-diagnose diseases were the most doctors treated in work hours	0.622	1.608
Whether patients with rehabilitation diseases were the most doctors treated in work hours	0.689	1.451
Whether patients with serious diseases were the most doctors treated in work hours	0.600	1.666
Whether patients seeking medicine were the most doctors treated in work hours	0.576	1.736
Whether doctors were satisfied with types of patients they treated	0.787	1.270
Whether patients with chronic diseases were the population doctors expected	0.630	1.587
Whether patients with rare diseases were the population doctors expected	0.678	1.476
Whether patients with common diseases were the population doctors expected	0.655	1.527
Whether patients with acute diseases were the population doctors expected	0.770	1.298
Whether patients with difficult-to-diagnose diseases were the population doctors expected	0.661	1.513
Whether patients with rehabilitation diseases were the population doctors expected	0.656	1.523
Whether patients with serious diseases were the population doctors expected	0.601	1.665
Whether patients seeking medicine were the population doctors expected	0.810	1.234
Whether patients with chronic diseases should seek medical treatment in the community health system	0.721	1.387
Whether patients with rare diseases should seek medical treatment in the community health system	0.751	1.332
Whether patients with common diseases should seek medical treatment in community health system	0.822	1.216
Whether patients with acute diseases should eek medical treatment in the community health system	0.785	1.274
Whether patients with difficult-to-diagnose diseases should seek medical treatment in the community health system	0.697	1.435
Whether patients with rehabilitation diseases should seek medical treatment in the community health system	0.705	1.419
Whether patients with serious diseases should seek medical treatment in the community health system	0.639	1.565

Whether patients seeking medicine should seek medical treatment in the community health system	0.714	1.400
Evaluation of patients' medical expenses in tertiary A hospitals	0.859	1.164
Evaluation of the extent patients respect doctors	0.789	1.267

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-6
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-7
		(*b*) Describe any methods used to examine subgroups and interactions	6-7
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-7
		(*e*) Describe any sensitivity analyses	6-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	5
		(c) Consider use of a flow diagram	5
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7-8
		(b) Indicate number of participants with missing data for each variable of interest	5
Outcome data	15*	Report numbers of outcome events or summary measures	7
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	8-10
		(*b*) Report category boundaries when continuous variables were categorized	8-10
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for	8-10

		a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	8-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.