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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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Manuscripts

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4 1 **A cross-sectional survey on job satisfaction and working**
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6 2 **condition among doctors in tertiary public hospitals in**
7
8 **Shanghai, China**
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22 Abstract

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

27 **Design:** It was a cross-sectional study.

28 **Setting:** 11 tertiary public hospitals in Shanghai, China.

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

32 **Primary outcome measures:** Doctors' job satisfaction.

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

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

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

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42 **Strengths and limitations of this study**

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

For peer review only

48 **Background**

49 Work-related problems of doctors are growing global concerns, of which, doctors' job
50 satisfaction was a heated topic¹. Job satisfaction means a lot for individuals and the society, such as
51 burnout^{2,3}, mental health⁴, work-family balance⁵, and quality of care⁶. As the great importance of
52 job satisfaction, studies have explored a lot about job satisfaction, including the status of different
53 dimensions about job satisfaction, a large number of surveys on job satisfaction and its influencing
54 factors, and interrelationships between burnout, work stress, mental health and job satisfaction
55 among doctors, nurses, and medical staff in different departments, regions and countries. Scholars
56 from different countries such as the United States, the United Kingdom, and German have tried to
57 deal with problems about job dissatisfaction⁷⁻⁹. It was discovered that many factors had an
58 influence on job satisfaction, including job pressure^{10,11}, interrelationships with patients and
59 colleagues^{12,13}, personal factors (e.g., gender and educational background)¹⁴, risk of the job¹⁵,
60 personal mental health¹⁶, job size¹⁷, financial status¹⁸, specialty and department^{19,20}. In addition,
61 doctors themselves also paid great attention to job satisfaction. Doctors worldwide have kept
62 fighting for their own rights to improve job satisfaction, working condition, professional
63 accomplishments, and career development for a long time. For example, doctors in Poland²¹ and
64 the Czech Republic²², have had conflicts with the governments regarding to overwork. Fortunately,
65 doctors in many countries and regions have succeeded in this fight, which ultimately improve their
66 job satisfaction, working efficiency, and care quality²³.

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

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4 70 costs²⁴. Hospitals were expected to sell drugs to patients without adding a 15% profit, which may
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6 71 decrease the hospital's income²⁵. Other policies such as controlling medication fees per visit and
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8 72 the cost of medical insurance have reduced doctors' decision-making power. Consequently,
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11 73 hospital management may force doctors to work overtime to augment or maintain hospital income
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13 74 if there was not enough compensation from the government²⁶. Doctors had to change their
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16 75 behaviours to fulfil hospital income indicators. In China, 4,526,978²⁷ doctors were under
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18 76 increasing pressures to see more patients, meet increased administrative requirements, and keep up
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21 77 with government regulations. Moreover, the lives of doctors are threatened in hospitals due to
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23 78 poor doctor-patient relationships²⁸. As doctors were overworked, underpaid, and under threat,
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26 79 some scholars have wondered who will be the next doctors in China²⁹.

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28 80 Therefore, to improve the poor hope of being a doctor in China and to change the current
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31 81 condition of doctors' job dissatisfaction, the main purpose of this study was to find out factors
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33 82 influencing job satisfaction among doctors in China and provide practical recommendations to
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36 83 improve Chinese doctors' working conditions and their job satisfaction.

37 38 84 **Methods**

39 40 41 85 ***Subjects***

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43 86 Between 18 June and 27 September 2013, a cross-sectional survey on doctors' job
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46 87 satisfaction was conducted in Shanghai, China. 1000 doctors in 11 public hospitals were selected
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48 88 at random, however, 897 were willing to participant in the study. Among the 897 questionnaires,
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51 89 730 were returned completed (there were not any missing data) with a valid response rate of
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53 90 81.38%. Doctors who were voluntary and signed the informed consent can be involved in the
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56 91 investigation. To address the bias coming from misunderstandings of the questionnaire,
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4 92 researchers of our program were responsible to explain confusing questions when doctors filled in
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6 93 questionnaires.

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8 94 ***Instrument Development and Validation***
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11 95 The questionnaire was designed to examine doctors' working conditions as well as their job
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13 96 satisfaction. The questionnaire was designed based on the 5th National Health Service General
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15 97 Research by the National Health and Family Planning Commission of the People's Republic of
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17 98 China. The general survey of the National Health Service included job satisfaction of medical staff.
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19 99 It was a rigorously developed instrument, based on the well-known and widely used Minnesota
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21 100 Satisfaction Questionnaire. The content validity was verified through an expert panel discussion,
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23 101 which included 5 experts. Cronbach's α coefficient was calculated to test the internal consistency
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25 102 of this questionnaire, with the value of 0.646. The Kaiser-Meyer-Olkin (KMO) test was used as a
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27 103 screening test for factorability, for which the value of KMO between 0.7 and 0.8 indicated good
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29 104 validity. In this study, the KMO was 0.703 ($P < 0.001$), which suggested acceptable validity.

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31 105 The instrument collected data on sociodemographic variables such as age, gender, level of
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33 106 education, position, professional title, and department. There were some multiple-choice questions
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35 107 about types of patients, including patients' types that doctors considered reasonable in different
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37 108 healthcare institutions, types doctors diagnosed actually, doctors' satisfaction with types of
38
39 109 patients, and what types of patients they expect. In addition, it asked about doctors' working time,
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41 110 life stress, working stress, and the sources of working stress. This survey also required doctors to
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43 111 rate their relationship with patients and evaluate the medical expenses of their patients. Questions
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45 112 about working and life stress, and doctor-patient relationship were on a Likert 5-point scale, such
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47 113 as completed not respectful, relatively not respectful, moderate, relatively respectful, and very
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4 114 respectful. Moreover, the question about doctors' job satisfaction was the observational variable.
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6 115 ***Ethical Approval*** 7

8 116 The study protocol was approved by the ethics committee of the Second Military Medical
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10 117 University. Only voluntary doctors signing the informed consent were involved in this survey. It
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12 118 was guaranteed to protect participants' confidentiality.
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15 119 ***Statistical Analysis*** 16

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18 120 All data were entered into Epidata version 3.1 and analysed using SPSS version 19.0.
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20 121 Sociodemographic data were described using frequencies and percentages. Chi-square tests were
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22 122 employed to test the relations between doctors' job satisfaction and other factors. Logistic
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24 123 regression analysis was further used to verify the influence of factors on doctors' job satisfaction.
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26 124 All tests were two-way and $p < 0.05$ was considered statistically significant.
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31 125 **Results** 32

33 126 ***Characteristics, working condition, and job satisfaction*** 34

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36 127 897 questionnaires were given out to doctors and all were returned. Among 897
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38 128 questionnaires, 730 were returned completed and without any missing data. Of the 730 valid
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40 129 questionnaires, 64.8% were dissatisfied with jobs, 35.2% reported job satisfaction. Male
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42 130 participants (55.8%) were more than the female (44.2%). More than half (70.6%) of them had an
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44 131 education level of master's or doctor's degree. Most participants were doctors (87.3%), only a
45
46 132 small of them were directors (7.5%), unspecified staff (4.9%), and researchers (0.3%). The
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48 133 majority (75.5%) had a junior or intermediate professional title. Half of participants (54.5%)
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50 134 worked 46-60 hours a week. Most participants (85.0%) can partly or totally reach the hospital
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52 135 requirement on their working. In terms of life and working stress, 78.0% and 87.5% participants
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4 136 reported they were suffering from great pressure; 78.9% reported their current working stress
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6 137 increased compared to that in the past year. Considering the aspects of working stress, the top
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8 138 three aspects reflecting working stress were working intensity (65.8%), long working time
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10 139 (57.7%), and high risk of the job (55.2%). In addition, only 36.3% doctors reported that their
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12 140 departments once organized a community health lecture; 56.4% departments once participated in a
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14 141 volunteer medical consultation. Moreover, participants believed patients with difficultly-diagnosed
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16 142 diseases (66.3%), serious diseases (62.1%), and rare diseases (53.3%) should seek medical
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18 143 treatment in tertiary A hospitals. However, in most participants' working time, they usually met
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20 144 patients with common diseases (83.0%), chronic diseases (67.9%), and the requirement of
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22 145 prescribing medicine (41.2%); only half of them (51.2%) were satisfied with the type of patients
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24 146 they met. When talking about which type of patients they expected, participants chose patients
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26 147 with difficultly-diagnosed diseases (63.0%), common diseases (52.1%), and serious diseases
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28 148 (47.7%). In the range of types of patients should seek medical treatment in community health
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30 149 system, most participants chose patients with common diseases (76.2%), the requirement of
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32 150 prescribing medicine (71.0%), and chronic diseases (66.7%). When evaluating the medical
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34 151 expenses of their patients, about half of participants (52.5%) thought the medical expenses were
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36 152 relatively or completely too expensive. Lastly, less than half of participants (43.8%) felt being
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38 153 respected by their patients (Table 1).
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154 **Table 1 Characteristics, working condition, and job satisfaction of participants**

155 *Univariate analysis of job satisfaction and its influencing factors*

156 According to chi-square test, the relationships between job satisfaction and other factors were
157 examined. Results indicated that some factors were significantly influenced doctors' job
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4 158 satisfaction, including professional title ($p = 0.005$), department ($p = 0.042$), working hours every
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6 159 week ($p = 0.015$), whether the work within working hours can reach the hospital requirement ($p =$
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8 160 0.008), life stress ($p < 0.0001$), working stress ($p < 0.0001$), whether current working stress
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11 161 increased compared to that in the past year ($p < 0.0001$), whether work intensity was the reflection
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13 162 of great working stress ($p < 0.0001$), whether long working time was the reflection of great
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15 163 working stress ($p < 0.0001$), whether high risk of the job was the reflection of great working stress
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17 164 ($p < 0.0001$), whether poor patient-doctor relationship was the reflection of great working stress (p
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19 = 0.001), whether fierce competition of professional title promotion was the reflection of great
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21 165 working stress ($p = 0.001$), whether bad social evaluation was the reflection of great working
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23 166 stress ($p < 0.0001$), whether patients with any kinds of diseases should seek medical treatment in
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25 167 tertiary A hospitals ($p = 0.04$), whether patients with requirement of prescribing medicine was the
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27 168 most doctors met in working hours ($p < 0.0001$), whether doctors were satisfied with the types of
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29 169 patients ($p < 0.0001$), whether patients with common diseases were the population doctors
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31 170 expected ($p = 0.005$), whether patients with acute diseases were the population doctors expected (p
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33 171 = 0.005), and the extent patients respected doctors ($p < 0.0001$).

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40 173 **Table 1 Characteristics, working condition, and job satisfaction of participants**

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43 174 ***Logistic regression analysis of job satisfaction and its influencing factors***

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45 175 Logistic regression analysis suggested that doctors' job satisfaction was related with such
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47 176 factors as junior professional title ($p = 0.024$), satisfaction with types of patients ($p = 0.006$), not
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49 177 expecting patients with common diseases ($p = 0.041$), working stress not increasing compared to
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51 178 that in the past year ($p = 0.045$), not considering work intensity was the reflection of great working
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53 179 stress ($p = 0.011$), and not considering bad social evaluation was the reflection of great working
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4 180 stress ($p = 0.002$). In addition, values of ORs and 95% Wald confidence interval indicated the
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6 181 exact relationships. Compared to doctors with senior professional titles, doctors with junior
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8 182 professional titles were less satisfied with their job ($OR = 0.420$). Similar result was found among
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11 183 doctors did not expect patients with common diseases in most of working hours (vs. doctors
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13 184 expect patients with common diseases) ($OR = 0.668$). On the other side, doctors who were
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15 185 satisfied with the types of patients they met in working hours were more likely to be satisfied with
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17 186 their job compared to those without a clear feeling about this question ($OR = 2.130$). Doctors
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19 187 whose working stress did not get greater than that in the past year were more satisfied with their
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21 188 job ($OR = 2.192$). Doctors who did not consider work intensity ($OR = 1.698$) and bad social
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23 189 evaluation ($OR = 2.097$) were not reflections of great working stress shared more job satisfaction
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28 190 (Table 2).

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

192 **Discussion**

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

196 First, unlike some studies in other countries and regions, demographic characteristics (e.g.,
197 gender and education background) were not influencing factors of job satisfaction^{30 31}. Only
198 doctors' professional title played a role, which was proved by other studies in China⁵ and Canada³².
199 Among doctors with junior professional titles, they were less satisfied with their job, which may
200 be attributed to many other factors. Because doctors' income was related to their professional
201 title³³, annual income of doctors with junior professional title was always lower than that of

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4 202 doctors with senior professional title. However, studies have proposed that income had a positive
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6 203 influence of doctors' job satisfaction^{2,5,18,34}. In addition, a study in the United Kingdom presented
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8 204 that young staff may fail to fully use their training, which was one of the possible reasons for low
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11 205 satisfaction⁸. This can also be explained by opportunities to use abilities and personal
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13 206 accomplishment during daily work, which were other aspects impeding young staff enjoying job
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15 207 satisfaction³⁵. Moreover, doctors with junior professional title in China faced more difficulties. A
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18 208 study in China investigated the professional title system and discovered that doctors felt unfair in
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21 209 promotion of their professional titles³⁶. It can be understood that young staff had greater demands
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23 210 of promotion, which would cause more dissatisfaction among them. Furthermore, the new policy
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25 211 about specialist standardisation training put more pressures on young staff, which required doctors
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28 212 to do an additional 2-4 years of specialist training after completing 3 years of resident
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31 213 standardisation training³⁷. During this process, these young doctors were extremely unsatisfied
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33 214 with their income, when they were undertaking great economic burdens to support their families.
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35 215 Therefore, all these factors explained why doctors with junior professional titles were less likely to
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38 216 be satisfied with their job.

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40 217 Second, patient composition was a significant factor influencing doctors' job satisfaction,
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43 218 which was for a particular phenomenon of China. Based on this survey, only 51.2% doctors were
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45 219 satisfied with types of patients they diagnosed, and the most were those with common diseases,
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48 220 which was the key leading to doctors' job dissatisfaction. Unlike the extreme two-way referral
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50 221 system in many developed countries (e.g., the United States), patients in China can choose any
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53 222 health institutions they prefer³⁸. This discipline caused overcrowding in tertiary A public
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55 223 hospitals³⁹, no matter which types of diseases. In fact, many patients with common, mild, or
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4 224 chronic diseases did not need to visit tertiary A public hospitals, which led to a waste of
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6 225 high-quality medical resources. Under this circumstance, doctors who wanted to eliminate pains of
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8 226 patients with serious, rare, or difficultly-diagnosed diseases would be disappointed at their work
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11 227 and feel desperate to improve themselves during clinical practices⁷. Therefore, job dissatisfaction
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13 228 appeared. To solve this problem, controlling hospital patient flow logistics⁴⁰ was the point.
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16 229 Encouraging patients and doctors to accept two-way referral was important, however, it should
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18 230 improve the health care quality of family doctors to make patients trust them. Moreover, it should
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21 231 realize that inadequate time spent in treatment of difficultly-diagnosed, serious, and rare diseases
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23 232 had a negative effect on doctors' skill development, which was the key point causing doctors' job
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26 233 dissatisfaction. Policy-makers and hospital administrators should provide more opportunities to
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28 234 doctors expecting patients with uncommon diseases, especially for those young staff.

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31 235 Third, working stress was another important factor of job satisfaction, which was also
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33 236 discovered by another study⁵. However, there was a new finding from this study, relative working
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35 237 stress (e.g., comparing working stress to that in the past year) was more significant to predict job
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38 238 satisfaction than absolute working stress (e.g., evaluation of working stress at present). Doctors
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41 239 felt greater relative working stress would be more likely to be dissatisfied with their job. In
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43 240 addition, it should pay more attention to which aspect doctors considered as the reflection of
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46 241 working stress, especially the aspect of work intensity and social evaluation. Doctors in tertiary A
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48 242 public hospitals usually undertook great amount of clinical tasks, for example, owing to the
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51 243 excessive patients, doctors had to diagnose and treat them as fast as possible, which always
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53 244 compelled them to quit drinking water or going to the toilet⁴¹. What's worse, several doctors were
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55 245 reported a sudden death due to the huge work intensity⁴². Similar studies in other countries have

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3 246 also stated that work intensity had a negative effect on job satisfaction⁷³⁰. Moreover, improving
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6 247 social evaluation would promote doctors' job satisfaction. At present, doctors did not have a good
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8 248 reputation because some of them pursued for personal economic interests by prescribing
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11 249 unnecessary medicine or tests for patients⁴³. It must be pointed out that, however, many other
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13 250 doctors without such behaviours were trapped in such an embarrassing dilemma. Our society
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16 251 should maintain an objective and impartial attitude towards most doctors and supervise those with
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18 252 a poor reputation.

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20 253 Fourth, it should pay attention to the working time. Working overtime has caused low job
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23 254 satisfaction and it was a problem among doctors worldwide, such as Britain⁴⁴, Spain⁴⁵, and
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25 255 Switzerland³⁴. This research finding was similar. Although the European Working Time Directive
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28 256 ruled that junior doctors should work no more than 48 hours per week⁴⁶, it was unrealistic in
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30 257 China. Doctors had to work overtime, which often deprived their family time and spare time.
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33 258 However, a study has proposed that work-private hours played a significant role in job
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35 259 satisfaction¹⁷. In addition, in Chinese hospitals, doctors' payment was based on performance,
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38 260 which indicated that whether doctors met job requirements was much more important than long
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40 261 working hours. Moreover, performance was critical for promotion, especially for junior doctors.
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43 262 Therefore, the contradiction between promotion, income and long working time led to job
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45 263 dissatisfaction. There was an urgent need to shorten working hours per week and change current
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47 264 disciplines for promotion and income⁴⁷.

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50 265 Fifth, it means a lot for doctors whether patients respected them. Owing to the overcrowding
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52 266 patients in tertiary A public hospitals, patients had to spend a long waiting time for registering,
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55 267 paying, and taking medicine compared to a short time meeting doctors. This unreasonable
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4 268 phenomenon has reduced patients' satisfaction and their respect for doctors, and sometimes even
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6 269 violence against doctors⁴⁸. To deal with this problem, a good patient-doctor relationship should be
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8 270 established by reducing patients in tertiary A public hospitals. If patients were willing to seek
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10 271 medical treatment in community healthcare system, doctors in tertiary A hospitals would spend
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12 272 more time diagnosing, treating, and communicating with patients while staying a good and patient
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14 273 attitude. To realize it, enhancing the community healthcare system and encouraging patients to
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16 274 choose health institutions reasonably were both important⁴⁹.

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20 275 Last, life stress was the other aspect of stress-related phenomena combined with working
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22 276 stress. Some syndromes such as depression, burnout syndrome, and other psychiatric reactions
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24 277 should be taken into consideration⁵⁰. Work-family conflict should also be addressed reasonably to
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26 278 avoid job dissatisfaction⁵. Moreover, it should be considered together with doctors' professional
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28 279 title and department. Doctors with junior titles may undertake more life stress from supporting
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30 280 their families, houses, and children. Therefore, paying more attention to doctors with heavier life
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32 281 and working stress would help them get more satisfied with their job. Doctors in different
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34 282 departments may also enjoy various extensions of job satisfaction²⁰, indicating hospital
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36 283 administrators could improve working conditions to various degrees according to departments
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38 284 where doctors were.

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42 285 There are two limitations to this study. First, due to unwillingness to answer questions about
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44 286 some personal information, age distribution and income were not obtained, which made it
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46 287 impossible to explore the effects on job satisfaction. Second, this survey was only conducted in 11
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48 288 tertiary A public hospitals of Shanghai, which could only represent the condition of doctors in
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50 289 such hospitals. Future studies will enlarge example size and explore more influencing factors.
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4 290 **Conclusions**

5
6 291 In conclusion, nearly 65% of doctors were not satisfied with their job in Shanghai, China,
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8 292 which was mainly influenced by their professional title, patient composition, working and life
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10 293 stress, working hours, patients' respect, and department. To address this problem, it should
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12 294 encourage policy-makers and hospital administrators to establish the two-way referral system,
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14 295 improve the current promotion and income system, shorten working hours, pay more attention to
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16 296 young staff, and help doctors keep a balance between work and family.
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33 302 **Authors' contributions**

34
35 303 This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must point out that
36
37 304 the four authors—JL, WY, TD, ML—contributed equally to this research. Here are the specific
38
39 305 efforts of each author. JL, WY, TD, ML made substantial contributions to conception and design,
40
41 306 analysis and interpretation of data, drafting the manuscript and revising it critically for important
42
43 307 intellectual content. LZ made substantial contributions to conception and design. All authors read
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45 308 and gave final approval of the version to be published.
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50 309 **Conflict of interest** None declared.

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52 310 **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)		

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3	Yes	412 (56.4)	264 (64.1)	148 (35.9)		
4	Which type of patients should seek medical treatment in tertiary A public hospitals (MCQ)					
5	All types	301 (41.2)	182 (60.5)	119 (39.5)	4.209	0.040
6	Chronic diseases	165 (22.6)	98 (59.4)	67 (40.6)	2.726	0.099
7	Rare diseases	389 (53.3)	258 (66.3)	131 (33.7)	0.854	0.355
8	Common diseases	171 (23.4)	105 (61.4)	66 (38.6)	1.126	0.289
9	Acute diseases	321 (44.0)	211 (65.7)	110 (34.3)	0.221	0.638
10	Difficultly-diagnosed diseases	484 (66.3)	321 (66.3)	163 (33.7)	1.470	0.225
11	Rehabilitation	71 (9.7)	45 (63.4)	26 (36.6)	0.069	0.793
12	Serious diseases	453 (62.1)	294 (64.9)	159 (35.1)	0.006	0.939
13						
14						
15	Which type of patients doctors met in most working hours (MCQ*)					
16	Chronic diseases	496 (67.9)	321 (64.7)	175 (35.3)	0.004	0.950
17	Rare diseases	82 (11.2)	46 (56.1)	36 (43.9)	3.063	0.080
18	Common diseases	606 (83.0)	399 (65.8)	207 (34.2)	1.715	0.190
19	Acute diseases	140 (19.2)	87 (62.1)	53 (37.9)	0.534	0.465
20	Difficultly-diagnosed diseases	190 (26.0)	114 (60.1)	76 (40.0)	2.588	0.108
21	Rehabilitation	81 (11.1)	52 (64.2)	29 (35.8)	0.014	0.905
22	Serious diseases	150 (20.5)	87 (58.0)	63 (42.0)	3.821	0.051
23	Prescribing medicine	301 (41.2)	221 (73.4)	80 (26.6)	16.713	<0.0001
24						
25						
26	Whether doctors were satisfied with types of patients they met				49.153	<0.0001
27	Satisfied	374 (51.2)	198 (52.9)	176 (47.1)		
28	Not satisfied	241 (33.0)	192 (79.7)	49 (20.3)		
29	Hard to say	115 (15.8)	83 (72.2)	32 (27.8)		
30						
31	Which type of patients doctors expect (MCQ*)					
32	Chronic diseases	267 (36.6)	162 (60.7)	105 (39.3)	3.133	0.077
33	Rare diseases	338 (46.3)	224 (66.3)	114 (33.7)	0.603	0.438
34	Common diseases	380 (52.1)	228 (60.0)	152 (40.0)	7.987	0.005
35	Acute diseases	196 (26.8)	143 (73.0)	53 (27.0)	7.830	0.005
36	Difficultly-diagnosed diseases	460 (63.0)	305 (66.3)	155 (33.7)	1.243	0.265
37	Rehabilitation	69 (9.5)	43 (62.3)	26 (37.7)	0.205	0.651
38	Serious diseases	348 (47.7)	238 (68.4)	110 (31.6)	3.770	0.052
39	Prescribing medicine	62 (8.5)	44 (71.0)	18 (29.0)	1.132	0.287
40						
41						
42	Which type of patients should seek medical treatment in community health system (MCQ*)					
43	Chronic diseases	487 (66.7)	322 (66.1)	165 (33.9)	1.125	0.289
44	Rare diseases	27 (3.7)	15 (55.6)	12 (44.4)	1.049	0.306
45	Common diseases	556 (76.2)	360 (64.7)	196 (35.3)	0.002	0.963
46	Acute diseases	33 (4.5)	19 (57.6)	14 (42.4)	0.790	0.374
47	Difficultly-diagnosed diseases	30 (4.1)	23 (76.7)	7 (23.3)	1.933	0.164
48	Rehabilitation	368 (50.4)	251 (68.2)	117 (31.8)	3.787	0.052
49	Serious diseases	23 (3.2)	15 (65.2)	8 (34.8)	0.002	0.966
50	Prescribing medicine	518 (71.0)	343 (66.2)	175 (33.8)	1.580	0.209
51						
52						
53	Evaluation of medical expenses of patients in tertiary A hospitals				8.352	0.079
54	Very cheap	28 (3.8)	24 (85.7)	4 (14.3)		
55	Relatively cheap	35 (4.8)	26 (74.3)	9 (25.7)		
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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)		

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

437 in this question.

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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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4 1 **A cross-sectional survey on job satisfaction and its**
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6 2 **associated factors among doctors in tertiary public hospitals**
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9 3 **in Shanghai, China**

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23 **Abstract**

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

28 **Design:** This was a cross-sectional study.

29 **Setting:** Eleven tertiary public hospitals in Shanghai, China.

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

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

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

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

49 **Keywords:** job satisfaction; doctor; hospital; China

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For peer review only

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51 **Strengths and limitations of this study**

52 ■ We tried to improve doctors' job satisfaction and promote becoming a doctor in
53 China.

54 ■ We provided a valuable reference for others interested in doctors' job satisfaction
55 and working conditions in China.

56 ■ We provided quantitative data concerning doctors' working conditions.

57 ■ Our research findings are only representative of doctors in tertiary A public
58 hospitals in China.

59

60 **Background**

61 Work-related problems of doctors are growing global concerns, especially
62 doctors' job satisfaction¹. Job satisfaction comprises issues such as burnout^{2,3}, mental
63 health⁴, work-family balance⁵, and quality of care⁶. Several studies have explored job
64 satisfaction, including its diverse dimensions²; its influencing factors⁷; and
65 interrelationships between burnout³, work stress^{8,9}, mental health⁴ and job satisfaction
66 among doctors, nurses, and medical staff in diverse departments, regions and
67 countries¹⁰.

68 Scholars from different countries such as the United States, the United Kingdom,
69 and Germany have tried to deal with problems concerning job dissatisfaction¹¹⁻¹³. For
70 example, scholars in the United States noted that workload, work meaningfulness,
71 relational needs, tolerance, and risk-taking attitudes were associated with job
72 satisfaction¹¹. Researchers in the United Kingdom indicated that whether physicians
73 can fully use their training was a key factor influencing their job satisfaction¹².
74 Scholars in Germany paid more attention to foreign-national physicians and suggested
75 that human relations and social status were related to their job satisfaction¹³. In
76 addition, job characteristics^{9,10,14-18} and personal factors¹⁹⁻²² have been found to affect
77 job satisfaction.

78 Further, doctors themselves pay great attention to job satisfaction. Doctors
79 worldwide fight for their own rights to improve job satisfaction, working condition,
80 professional accomplishments, and career development. For example, doctors in
81 Poland²³ and the Czech Republic²⁴ have had conflicts with their respective

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4 82 governments regarding overwork. Fortunately, doctors in many countries and regions
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6 83 have succeeded in this fight, which ultimately improve their job satisfaction, work
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8 84 efficiency, and care quality²⁵.

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11 85 Moreover, healthcare reform is a vital component of doctors' job satisfaction and
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13 86 working conditions, and China is no exception. In Chinese healthcare reform, the
14
15 87 government pays considerable attention to reducing medication costs²⁶. Hospitals are
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17 88 expected to sell drugs to patients without adding a 15% profit, which may decrease
18
19 89 the hospital's income²⁷. Other policies such as controlling medication fees per visit
20
21 90 and the cost of medical insurance have reduced doctors' decision-making power.
22
23 91 Consequently, hospital management may force doctors to work overtime to augment
24
25 92 or maintain hospital income if there is not enough government compensation²⁸.
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27 93 Moreover, doctors had to change their behaviors to fulfil hospital income indicators.
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29 94 In China, over 4.5 million doctors are under increasing pressures to see more patients,
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31 95 meet increased administrative requirements, and keep up with government
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33 96 regulations²⁹. Moreover, the lives of doctors are threatened in hospitals owing to poor
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35 97 doctor-patient relationships³⁰. As doctors are overworked, underpaid, and under
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37 98 threat, some scholars have wondered who will be the next doctors in China³¹.

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40 99 Therefore, the main purpose of this study was to promote the development of
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42 100 more doctors in China and to enhance the condition of doctors. We determined what
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44 101 factors affect doctors' job satisfaction in China and provide practical
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46 102 recommendations to improve Chinese doctors' job satisfaction and working
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48 103 conditions.
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4 104 **Methods**

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6 105 ***Participants***

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8 106 Between June 18 and September 27, 2013, a cross-sectional survey about
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10 107 doctors' job satisfaction was conducted in Shanghai, China. Using random number
11
12 108 tables, we selected eleven tertiary public hospitals in Shanghai. Questionnaires were
13
14 109 administered to 1,000 doctors in these hospitals. All participants were also chosen
15
16 110 through random number tables, which were based on doctors' job number. Among the
17
18 111 1,000 participants, 897 were willing to participate, and 103 doctors were excluded
19
20 112 from this study because of their unwillingness. Of these, 730 were returned complete
21
22 113 (valid response rate = 81.4%). Doctors who volunteered and provided informed,
23
24 114 written consent participated. Researchers addressed doctors' queries and doubts
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26 115 regarding the questionnaire as needed.
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33 116 ***Instrument Development and Validation***

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35 117 The questionnaire was designed to examine doctors' working conditions and job
36
37 118 satisfaction. The questionnaire was designed based on the 5th National Health Service
38
39 119 General Research by the National Health and Family Planning Commission of the
40
41 120 People's Republic of China³². The general survey of the National Health Service
42
43 121 included job satisfaction of medical staff. It was a rigorously developed instrument,
44
45 122 based on the well-known and widely used Minnesota Satisfaction Questionnaire³³. Its
46
47 123 content validity was verified through an expert panel discussion, which included 5
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49 124 experts. To determine the internal consistency of this questionnaire, Cronbach's α
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51 125 coefficient was calculated, which was 0.65. The Kaiser-Meyer-Olkin (KMO) test was
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4 126 used as a screening test for factorability, which was 0.703 ($p < 0.001$), indicating
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6 127 acceptable validity.
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8 128 We collected data on sociodemographic variables such as age, sex, education
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10 129 level, position, professional title, and department. Positions comprised directors,
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13 130 doctors, researchers, and unspecified staff. The unspecified staff were doctoral
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15 131 students studying and working in these hospitals. There were some structured
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17 132 questions about types of patients, including types of patients that doctors thought
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19 133 should be treated in different healthcare institutions, doctors' satisfaction with the
20
21 134 types of patients they were treating, and what types of patients they expected to treat.
22
23 135 In addition, we asked about doctors' work time, life stress, work stress, and the
24
25 136 sources of work stress. The sources of work stress included work intensity, long
26
27 137 hours, patients' lofty expectations, job risks, poor patient-doctor relationships, poor
28
29 138 colleague relationships, competition for promotion, poor social evaluations, and
30
31 139 societal misunderstandings. Work intensity reflected the quantum of doctors' work,
32
33 140 which was mainly evaluated by the number of patients that doctors diagnosed and
34
35 141 treated (including surgery). Poor social evaluations reflected doctors' reputation
36
37 142 among patients, which considered doctors' professional abilities and personal
38
39 143 characteristics. We also asked doctors to rate their relationships with patients and
40
41 144 evaluate patients' medical expenses. Questions about working and life stress, and
42
43 145 doctor-patient relationships were measured using a 5-point Likert scale (*not*
44
45 146 *respectful*, *relatively not respectful*, *moderate*, *relatively respectful*, and *very*
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47 147 *respectful*). The question about doctors' job satisfaction was the dependent variable.
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4 148 ***Ethical Approval***
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6 149 The study protocol was approved by the ethics committee of the Second Military
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8 150 Medical University. We protected participants' confidentiality.
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11 151 ***Statistical Analyses***
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13 152 All data were entered into Epidata version 3.1 and analyzed using SPSS version
14
15 153 19.0 and SAS version 8.0. Sociodemographic data were described using frequencies
16
17 154 and percentages. Chi-square tests were employed to test the differences in job
18
19 155 satisfaction among doctors with different personal characteristics and other factors. A
20
21 156 logistic regression analysis was further used to verify the influence of factors on
22
23 157 doctors' job satisfaction. In the logistic regression analysis, the dependent variable
24
25 158 was doctors' job satisfaction. Independent variables entered into the logistic
26
27 159 regression analysis were based on the univariate analysis results that were all
28
29 160 significantly related to doctors' job satisfaction. We employed the stepwise selection
30
31 161 method, with inclusion criteria of 0.10 and exclusion criteria of 0.15. We also
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33 162 employed a multicollinearity analysis to test collinearity. All tests were two-tailed and
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35 163 $p < 0.05$ were considered significant.
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43 164 ***Patient and Public Involvement***
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45 165 We declare that no patients or public were involved in this study.
46

47 166 **Results**
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50 167 ***Characteristics, Working Condition, and Job Satisfaction***
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52 168 Overall, 64.8% of participants were dissatisfied with their jobs. Participants'
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54 169 personal and job characteristics are shown in Table 1.
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170 **Table 1. Participants' personal and job characteristics**

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

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

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

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

191 *Univariate Analysis of Job Satisfaction and its Influencing Factors*

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4 192 Using chi-square tests, the relationships between job satisfaction and other
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6 193 factors were examined. Results indicated that several factors significantly influenced
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8 194 doctors' job satisfaction (all p-values < 0.05), including the following: professional
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10 195 title ($\chi^2 = 12.674$), department ($\chi^2 = 8.213$), work hours every week ($\chi^2 = 16.935$),
11
12 196 whether the work within working hours met hospital requirements ($\chi^2 = 13.846$), life
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14 197 stress ($\chi^2 = 20.524$), work stress ($\chi^2 = 39.135$), whether current work stress increased
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16 198 compared to that in the past year ($\chi^2 = 20.777$), whether work intensity reflected work
17
18 199 stress ($\chi^2 = 23.979$), whether working long hours reflected work stress ($\chi^2 = 22.459$),
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20 200 whether high jobs risks reflected work stress ($\chi^2 = 21.678$), whether a poor
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22 201 patient-doctor relationship reflected work stress ($\chi^2 = 1.083$), whether competition for
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24 202 promotion reflected work stress ($\chi^2 = 12.045$), whether a poor social evaluation
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26 203 reflected work stress ($\chi^2 = 25.303$), whether patients should seek medical treatment in
27
28 204 tertiary A hospitals ($\chi^2 = 4.209$), whether patients seeking medicine were the most
29
30 205 common type doctors treated ($\chi^2 = 16.713$), whether doctors were satisfied with the
31
32 206 type of patients they treated ($\chi^2 = 49.153$), whether patients with common diseases
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34 207 were the population doctors expected ($\chi^2 = 7.987$), whether patients with acute
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36 208 diseases were the population doctors expected ($\chi^2 = 7.830$), and the extent patients
37
38 209 respected doctors ($\chi^2 = 44.764$) (Tables 1–3).

210 ***Logistic Regression Analysis of Job Satisfaction and its Influencing Factors***

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

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4 214 the variance inflation factor (VIF) is > 5 , collinearity exists. The multicollinearity
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6 215 analysis indicated that collinearity did not exist (Supplementary Table 1).
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8 216 As shown in Table 4, 9 factors were entered into the logistic regression model.
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10 217 Doctors who were satisfied with the types of patients they treated were more likely to
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13 218 be satisfied with their job compared to those who were not satisfied. Doctors who did
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16 219 not consider work intensity or poor social evaluation as reflective of their work stress
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18 220 had more job satisfaction than did their counterparts. Doctors who felt moderate work
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20 221 stress felt more satisfied with their job compared with those with great work stress.
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23 222 Doctors who had an expectation of treating patients with common diseases were more
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25 223 satisfied with their jobs. Lastly, doctors with senior professional titles were more
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27 224 satisfied with their job compared with doctors with lower-level titles.
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30 225 **Table 4. Logistic regression analysis of job satisfaction and its influencing factors**
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33 226 **Discussion**
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35 227 Doctors' job satisfaction was influenced by their professional title, patient
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37 228 composition, and work stress. Some factors like department, work hours, patients'
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39 229 respect, and life stress were also related to doctors' job satisfaction.
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42 230 First, unlike some studies in other countries and regions, demographic
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44 231 characteristics (e.g., sex and education background) were not influencing factors of
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46 232 job satisfaction^{34 35}. Only doctors' professional title played a role, which was
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48 233 supported by other studies in China⁵ and Canada³⁶. Junior doctors were less satisfied
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50 234 with their job, which may be attributed to many other factors. Because doctors'
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52 235 income was related to their professional title³⁷, the annual income of junior doctors
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4 236 was always lower than that of senior doctors. However, studies have proposed that
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6 237 income positively influences doctors' job satisfaction^{2 5 17 38}. In addition, a study in the
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8 238 United Kingdom noted that young staff may fail to fully use their training, which
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11 239 could foster low satisfaction¹². This can also be explained by opportunities to use
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13 240 one's abilities and personal accomplishments during daily work, which were other
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15 241 aspects impeding young staff from enjoying job satisfaction⁷. Moreover, junior
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17 242 doctors in China face additional difficulties, including an unfair promotion system³⁹.
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20 243 Furthermore, the new policy about specialist standardization training places more
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23 244 pressure on young staff, since it requires doctors to do an additional 2–4 years of
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25 245 specialist training after completing 3 years of resident standardization training⁴⁰.
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28 246 During this process, young doctors may become unsatisfied with their income and
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30 247 their inability to support their families, which, in turn, promotes further job
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33 248 dissatisfaction.

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35 249 Second, patient composition was a significant factor influencing doctors' job
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38 250 satisfaction. Around 51.2% of the doctors were satisfied with the type of patients they
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40 251 treated; however, 52.1% of the doctors mostly treated patients with common diseases
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43 252 every day. The low satisfaction seemed to reflect the gap between their expectations
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45 253 and the reality. Because doctors in tertiary A public hospitals have the best
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48 254 professional abilities and hope to deal with the most difficult and complicated
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50 255 diseases, they expect to treat patients with difficult-to-diagnose diseases. However,
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53 256 unlike the two-way referral system in many developed countries (e.g., the United
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55 257 States), patients in China can choose the health institution they prefer⁴¹. This causes
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3 258 overcrowding in tertiary A public hospitals⁴², regardless of disease type. In fact, many
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6 259 patients with common, mild, or chronic diseases do not need to visit tertiary A public
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8 260 hospitals, as this wastes high-quality medical resources. Under these circumstances,
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11 261 doctors who wish to solve difficult-to-diagnose cases feel disappointed and
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13 262 dissatisfied with their work¹¹. To solve this problem, hospital patient flow logistics
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15 263 should be controlled⁴³. Encouraging patients and doctors to accept two-way referral is
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18 264 vital; however, the level of trust between doctors and patients is also critical.
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21 265 Moreover, it should be noted that inadequate time spent treating difficult-to-diagnose
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23 266 diseases has a negative effect on doctors' skill development, which can also cause
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25 267 doctors' job dissatisfaction. Policymakers and hospital administrators should provide
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28 268 more opportunities to doctors expecting more difficult-to-diagnose patients, especially
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31 269 junior doctors.

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33 270 Third, work stress was related to job satisfaction, which supported a past study⁵.
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35 271 However, we also found that relative work stress (i.e., comparing work stress to that
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37 272 in the past year) more significantly predicted job satisfaction than did present work
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39 273 stress. Doctors who felt greater relative work stress were more likely to be dissatisfied
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41 274 with their job than their counterparts. In addition, the factors that doctors consider as
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43 275 reflective of work stress, especially work intensity and social evaluation, require
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45 276 attention. Doctors working in tertiary A public hospitals usually undertake many
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47 277 clinical tasks; for example, because of the excess of patients, doctors have to diagnose
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49 278 and treat them as fast as possible, which limits doctors' ability to take breaks⁴⁴. What
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51 279 is worse, several doctors died suddenly, possibly owing to the work intensity⁴⁵.
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4 280 Similar studies in other countries have also stated that work intensity negatively
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6 281 affects job satisfaction^{11 34}. Moreover, improving their social evaluation may improve
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8 282 doctors' job satisfaction. At present, doctors in China do not have a good reputation
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11 283 because of some doctors pursuing personal economic interests by prescribing
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13 284 unnecessary medicine or tests for patients⁴⁶. It must be noted that there are many other
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16 285 doctors who do not resort to such unethical practices; however, they also become
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18 286 victims of this stigmatization. Our society should maintain an objective and impartial
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21 287 attitude towards most doctors and supervise those with a poor reputation.
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23 288 Fourth, doctors' long work hours require attention. Working overtime has caused
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25 289 low job satisfaction worldwide, such as in Britain⁴⁷, Spain⁴⁸, and Switzerland³⁸. Our
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28 290 finding was similar. Although the European Working Time Directive ruled that junior
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30 291 doctors should work no more than 48 hours per week⁴⁹, this was unrealistic in China.
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33 292 Doctors have to work overtime, which often limits their family time and spare time.
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35 293 However, a study proposed that work-private hours also play a key role in job
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37 294 satisfaction⁹. In addition, in Chinese hospitals, doctors' payment is based on their
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40 295 performance, indicating that meeting job requirements may be more critical than
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43 296 working long hours. Moreover, performance is critical for promotion, especially for
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45 297 junior doctors. Therefore, there is an urgent need to shorten doctors' weekly work
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48 298 hours and change the current promotion and income structure, which may promote
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50 299 increased job satisfaction⁵⁰.

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52 300 Fifth, it is reasonable to assume that if doctors feel respected by patients, they
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55 301 will be more satisfied with their work. Great respect from patients indicated their
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4 302 great recognition of doctors' professional abilities, personal characteristics, and good
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6 303 reputation. All of these good aspects would accelerate doctors' enthusiasms of their
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8 304 work, which then reflected as job satisfaction. However, due to the overcrowding of
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10 305 patients in tertiary A public hospitals, patients spend a long time waiting to register,
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12 306 pay, and fill prescriptions compared to a short time meeting doctors. This
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14 307 unreasonable phenomenon has reduced patients' satisfaction and their respect for
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16 308 doctors, and sometimes even results in violence against doctors⁵¹. Therefore, faced
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18 309 with the poor patient-doctor relationship and violence from patients, it is more
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20 310 possible to cause doctors' job dissatisfaction. To deal with this problem and enhance
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22 311 the patient-doctor relationship, the number of patients visiting tertiary A public
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24 312 hospitals should be decreased. If patients with common or minor diseases are willing
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26 313 and encouraged to seek medical treatment in the community healthcare system,
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28 314 doctors at tertiary A hospitals can spend more time diagnosing, treating, and
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30 315 communicating with patients, while maintaining a positive and patient attitude⁵².

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38 316 Lastly, other life stress is also related to job satisfaction, and problems such as
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40 317 depression and burnout require consideration⁵³. Work-family conflict should also be
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42 318 addressed to avoid job dissatisfaction⁵. Moreover, doctors' professional title and
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44 319 department may factor into job satisfaction. Junior doctors may undertake more life
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46 320 stress from supporting their families; therefore, these doctors may require additional
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48 321 support. Doctors in different departments may also enjoy various extensions of job
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50 322 satisfaction¹⁸, indicating hospital administrators could improve working conditions to
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52 323 various degrees according to departments where doctors were.
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4 324 There are two limitations to this study. First, due to doctors' unwillingness to
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6 325 answer questions about certain personal information, information on age distribution
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8 326 and income were not obtained, which made it impossible to explore the effects of
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11 327 these on job satisfaction. Second, this survey was only conducted in eleven tertiary A
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13 328 public hospitals in Shanghai, which limits generalizability. Future studies should
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16 329 include more hospitals and more possible factors.

18 330 **Conclusions**

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20 331 In conclusion, most doctors were not satisfied with their jobs in Shanghai, China,
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23 332 and this was mainly influenced by their professional title, patient composition, and
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26 333 work stress. To address this problem, policymakers and hospital administrators should
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28 334 establish the two-way referral system, improve the current promotion and income
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30 335 structure, pay more attention to less-experienced staff, and help doctors release their
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33 336 work stress.

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47
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50 343 **Authors' contributions**

51
52 344 This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must
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55 345 point out that the four authors—JL, WY, TD, ML—contributed equally to this
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3 346 research. Here are the specific efforts of each author. JL, WY, TD, ML made
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6 347 substantial contributions to conception and design, analysis and interpretation of data,
7
8 348 drafting the manuscript and revising it critically for important intellectual content. LZ
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11 349 made substantial contributions to conception and design. All authors read and gave
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13 350 final approval of the version to be published.

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16 351 **Conflict of interest** None declared.

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18 352 **Data sharing statement** No additional data are available.

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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 (%)		
Work hours per week (hours)		473 (64.8)	257 (35.2)	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				39.135	<0.0001
Very light	0 (0.0)	0 (0.0)	0 (0.0)		
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

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3	Whether departments once organized a community health lecture			1.542	0.214
4	No	465 (63.7)	309 (66.5)	156 (33.5)	
5	Yes	265 (36.3)	164 (61.9)	101 (38.1)	
6					
7	Whether departments once participated in a volunteer medical				
8	consultation			0.213	0.644
9	No	318 (43.6)	209 (65.7)	109 (34.3)	
10	Yes	412 (56.4)	264 (64.1)	148 (35.9)	
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Table 3. Patient-related issues and job satisfaction

	N (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction	Satisfaction		
		N (%)	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)		

489 Asterisk (*): MCQ means multiple-choice question. Participants can choose more
 490 than one option in this question.
 491

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

493

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

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2			
3	work hours		
4	Whether patients with common diseases were the most doctors treated	0.587	1.704
5	in work hours		
6	Whether patients with rare diseases were the most doctors treated in	0.747	1.338
7	work hours		
8	Whether patients with difficult-to-diagnose diseases were the most	0.622	1.608
9	doctors treated in work hours		
10	Whether patients with rehabilitation diseases were the most doctors	0.689	1.451
11	treated in work hours		
12	Whether patients with serious diseases were the most doctors treated in	0.600	1.666
13	work hours		
14	Whether patients seeking medicine were the most doctors treated in	0.576	1.736
15	work hours		
16	Whether doctors were satisfied with types of patients they treated	0.787	1.270
17	Whether patients with chronic diseases were the population doctors	0.630	1.587
18	expected		
19	Whether patients with rare diseases were the population doctors	0.678	1.476
20	expected		
21	Whether patients with common diseases were the population doctors	0.655	1.527
22	expected		
23	Whether patients with acute diseases were the population doctors	0.770	1.298
24	expected		
25	Whether patients with difficult-to-diagnose diseases were the population	0.661	1.513
26	doctors expected		
27	Whether patients with rehabilitation diseases were the population	0.656	1.523
28	doctors expected		
29	Whether patients with serious diseases were the population doctors	0.601	1.665
30	expected		
31	Whether patients seeking medicine were the population doctors	0.810	1.234
32	expected		
33	Whether patients with chronic diseases should seek medical treatment in	0.721	1.387
34	the community health system		
35	Whether patients with rare diseases should seek medical treatment in the	0.751	1.332
36	community health system		
37	Whether patients with common diseases should seek medical treatment	0.822	1.216
38	in community health system		
39	Whether patients with acute diseases should seek medical treatment in	0.785	1.274
40	the community health system		
41	Whether patients with difficult-to-diagnose diseases should seek	0.697	1.435
42	medical treatment in the community health system		
43	Whether patients with rehabilitation diseases should seek medical	0.705	1.419
44	treatment in the community health system		
45	Whether patients with serious diseases should seek medical treatment in	0.639	1.565
46	the community health system		
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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.

BMJ Open

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

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4 1 **A cross-sectional survey on job satisfaction and its**
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6 2 **associated factors among doctors in tertiary public hospitals**
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9 3 **in Shanghai, China**
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3
4 23 **Abstract**

5
6 24 **Objectives:** Doctors in public hospitals in China face considerable pressure and
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8
9 25 excessive workloads, which are likely to predispose them to job dissatisfaction. We
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11 26 explored the job satisfaction of doctors and examined the influence of diverse
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13
14 27 sociodemographic characteristics.

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16
17 28 **Design:** This was a cross-sectional study.

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19 29 **Setting:** Eleven tertiary public hospitals in Shanghai, China.

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22 30 **Participants:** The questionnaire was designed based on the 5th National Health
23
24 31 Service General Research, which was based on the Minnesota Satisfaction
25
26 32 Questionnaire. Questionnaires were administered to 897 doctors randomly (using
27
28 33 random number tables), and 730 were returned completed (response rate = 81.4%).
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30
31 34 Doctors who volunteered and provided informed, written consent participated.

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33 35 **Primary outcome measures:** The dependent variable was doctors' job satisfaction.

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35 36 **Results:** Statistical analyses were conducted using SPSS and SAS. Overall, 64.8% of
36
37 37 participants were dissatisfied with their jobs. Factors that were statistically significant
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39 38 to doctors' job satisfaction in the univariate analysis were entered into the logistic
40
41 39 regression analysis, including doctors' professional title, department, work hours,
42
43 40 work requirements (reflected as the number of patients they diagnosed and treated
44
45 41 monthly), life and work stress, and the types of patients that doctors treated or
46
47 42 expected to treat. The results of the logistic regression analysis suggested that doctors'
48
49 43 job satisfaction was related to their professional title, types of patients that doctors
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51 44 treated or expected to treat, as well as their work stress.
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4 45 **Conclusions:** There is an urgent need for public hospitals in China to establish a more
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6 46 reasonable promotion and management system for doctors, encourage patients to
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9 47 accept the two-way referral, pay more attention to less-experienced staff, and help
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11
12 48 doctors release their work stress.
13
14 49 **Keywords:** job satisfaction; doctor; hospital; China
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4 51 **Strengths and limitations of this study**
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6 52 ■ We tried to suggest ways to improve doctors' job satisfaction and promote
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8 becoming a doctor in China.
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11 54 ■ We provided a valuable reference for others interested in doctors' job satisfaction
12
13 and working conditions in China.
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15

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17 56 ■ We provided quantitative data concerning doctors' working conditions.
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20 57 ■ Our research findings are only representative of doctors in tertiary A public
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22 hospitals in China.
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25 59 ■ Income or income-workload balance was not explored in this study, which is a
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27 major limitation.
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62 **Background**

63 Work-related problems of doctors are growing global concerns, especially
64 doctors' job satisfaction¹. Job satisfaction comprises issues such as burnout^{2,3}, mental
65 health⁴, work-family balance⁵, and quality of care⁶. Several studies have explored job
66 satisfaction, including its diverse dimensions²; its influencing factors⁷; and
67 interrelationships between burnout³, work stress^{8,9}, mental health⁴ and job satisfaction
68 among doctors, nurses, and medical staff in diverse departments, regions and
69 countries¹⁰. Several studies in different countries have also indicated that income and
70 income-workload balance are related to doctors' job satisfaction¹¹⁻¹³.

71 Scholars from different countries such as the United States, the United Kingdom,
72 and Germany have tried to deal with problems concerning job dissatisfaction¹⁴⁻¹⁶. For
73 example, scholars in the United States noted that workload, work meaningfulness,
74 relational needs, tolerance, and risk-taking attitudes were associated with job
75 satisfaction¹⁴. Researchers in the United Kingdom indicated that whether physicians
76 can fully use their training was a key factor influencing their job satisfaction¹⁵.
77 Scholars in Germany paid more attention to foreign-national physicians and suggested
78 that human relations and social status were related to their job satisfaction¹⁶. In
79 addition, job characteristics^{9,10,17-21} and personal factors²²⁻²⁵ have been found to affect
80 job satisfaction.

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

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4 84 Poland²⁶ and the Czech Republic²⁷ have had conflicts with their respective
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6 85 governments regarding overwork. Fortunately, doctors in many countries and regions
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9 86 have succeeded in this fight, which ultimately improves their job satisfaction, work
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11
12 87 efficiency, and care quality²⁸.

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14 88 Moreover, healthcare reform is a vital component of doctors' job satisfaction and
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17 89 working conditions, and China is no exception. In Chinese healthcare reform, the
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20 90 government pays considerable attention to reducing medication costs²⁹. Hospitals are
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23 91 expected to sell drugs to patients without adding a 15% profit, which may decrease
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26 92 the hospital's income³⁰. Other policies such as controlling medication fees per visit
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29 93 and the cost of medical insurance have reduced doctors' decision-making power.
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32 94 Consequently, hospital management may force doctors to work overtime to augment
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35 95 or maintain hospital income if there is not enough government compensation³¹.
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38 96 Moreover, doctors had to change their behaviors to fulfill hospital income indicators.
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40
41 97 In China, over 4.5 million doctors are under increasing pressures to see more patients,
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44 98 meet increased administrative requirements, and keep up with government
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47 99 regulations³². Moreover, the lives of doctors are threatened in hospitals owing to poor
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50 100 doctor-patient relationships³³. As doctors are overworked, underpaid, and under
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53 101 threat, some scholars have wondered who will be the next doctors in China³⁴.

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56 102 Therefore, the main purpose of this study was to suggest ways to promote the
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59 103 development of more doctors in China and improve the condition of doctors. We
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104 determined what factors affect doctors' job satisfaction in China and provide practical
105 recommendations to improve Chinese doctors' job satisfaction and working

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4 106 conditions.

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6 107 **Methods**

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9 108 ***Participants***

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11 109 Between June 18 and September 27, 2013, a cross-sectional survey of doctors'
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14 110 job satisfaction was conducted in Shanghai, China. Using random number tables, we
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16
17 111 selected eleven tertiary public hospitals in Shanghai. Questionnaires were
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19
20 112 administered to 1,000 doctors in these hospitals. All participants were also chosen
21
22
23 113 through random number tables, which were based on doctors' job number. Of the
24
25 114 1,000 participants, 897 were willing to participate, and 103 doctors were excluded
26
27 115 from this study because of their unwillingness to participate. Of these, 730 were
28
29
30 116 returned complete (valid response rate = 81.4%). Doctors who volunteered and
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32
33 117 provided informed, written consent participated. Researchers addressed doctors'
34
35 118 queries and doubts regarding the questionnaire as needed.

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38 119 ***Instrument Development and Validation***

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40 120 The questionnaire was designed to examine doctors' working conditions and job
41
42
43 121 satisfaction. The questionnaire was designed based on the 5th National Health Service
44
45
46 122 General Research by the National Health and Family Planning Commission of the
47
48 123 People's Republic of China³⁵. The general survey of the National Health Service
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50
51 124 included job satisfaction of medical staff. It was a rigorously developed instrument,
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54 125 based on the well-known and widely used Minnesota Satisfaction Questionnaire³⁶. Its
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56 126 content validity was validated through an expert panel discussion, which included 5
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59 127 experts. To determine the internal consistency of this questionnaire, Cronbach's α
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4 128 coefficient was calculated, which was 0.65. The Kaiser-Meyer-Olkin (KMO) test was
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6 129 used as a screening test for factorability, which was 0.703 ($p < 0.001$), indicating
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8
9 130 acceptable validity.

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11 131 We collected data on sociodemographic variables such as age, sex, education
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14 132 level, position, professional title, and department. Positions comprised directors,
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17 133 doctors, researchers, and unspecified staff. The unspecified staff members were
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20 134 doctoral students studying and working in these hospitals. There were some structured
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22 135 questions about types of patients, including types of patients that doctors thought
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24
25 136 should be treated in different healthcare institutions, doctors' satisfaction with the
26
27 137 types of patients they were treating, and what types of patients they expected to treat.
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29
30 138 In addition, we asked about doctors' work time, life stress, work stress, and the
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33 139 sources of work stress. The sources of work stress included work intensity, long
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35 140 hours, patients' lofty expectations, job risks, poor patient-doctor relationships, poor
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37 141 colleague relationships, competition for promotion, poor social evaluations, and
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40 142 societal misunderstandings. Work intensity reflected the quantum of doctors' work,
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42
43 143 which was mainly evaluated by the number of patients that doctors diagnosed and
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45 144 treated (including surgery). Poor social evaluations reflected doctors' reputation
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48 145 among patients, which considered doctors' professional abilities and personal
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51 146 characteristics. We also asked doctors to rate their relationships with patients and
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53 147 evaluate patients' medical expenses. Questions about working and life stress, and
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56 148 doctor-patient relationships were measured using a 5-point Likert scale (*not*
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58 149 *respectful*, *relatively not respectful*, *moderate*, *relatively respectful*, and *very*
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4 150 *respectful*). Doctors' job satisfaction was the dependent variable in this study.
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6
7 151 Because job satisfaction and dissatisfaction were evaluated from multiple aspects,
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9 152 doctors had to make an evaluation of their job based on their work time, life stress,
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11 153 work stress, and the sources of work stress. Based on the definition by Gothe et al.³⁷,
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14 154 if the individual is happy with their job after considering all the above factors, they
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17 155 could evaluate their job as satisfactory; otherwise, they could evaluate it as
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19
20 156 dissatisfactory.

21 22 157 ***Ethical Approval***

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24
25 158 The study protocol was approved by the ethics committee of the Second Military
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27 159 Medical University. We protected the participants' confidentiality. All participants
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30 160 provided written informed consent.

31 32 161 ***Statistical Analyses***

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34
35 162 All data were entered into Epidata version 3.1 and analyzed using SPSS version
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37 163 19.0 and SAS version 8.0. Sociodemographic data were described using frequencies
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40 164 and percentages. Chi-square tests were employed to test the differences in job
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43 165 satisfaction among doctors with different personal characteristics and other factors. A
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45 166 binary logistic regression analysis was further used to verify the influence of factors
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47
48 167 on doctors' job satisfaction. In the logistic regression analysis, the dependent variable
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50
51 168 was doctors' job satisfaction. Independent variables entered into the logistic
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53 169 regression analysis were based on the univariate analysis results that were all
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55
56 170 significantly related to doctors' job satisfaction. We employed the stepwise selection
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58
59 171 method, with inclusion criteria of 0.10 and exclusion criteria of 0.15. We also
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4 172 employed a multicollinearity analysis to test collinearity. All tests were two-tailed and
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6 173 $p < 0.05$ was considered significant.
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9 174 ***Patient and Public Involvement***

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11 175 We declare that no patients or public were involved in this study.
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14 176 **Results**

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17 177 ***Characteristics, Working Condition, and Job Satisfaction***

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19 178 Overall, 64.8% of participants were dissatisfied with their jobs. Participants'
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22 179 personal and job characteristics are shown in Table 1.
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24
25 180 **Table 1. Participants' personal and job characteristics**

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27 181 Working conditions and participants' job satisfaction are shown in Table 2.
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29
30 182 Nearly 88% of the participants worked more than 40 hours a week. It was found that
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32 183 85% of the doctors could basically meet the hospitals' working requirements, which
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35 184 were reflected as the number of patients they diagnosed and treated monthly. Most
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37
38 185 reported work and life stress, which had increased in the last year, and was due to
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41 186 working intensity, long hours, and job risks. In addition, about one-third of doctors
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44 187 reported that their departments organized a community health lecture, and more than
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46 188 half of the departments participated in a volunteer medical consultation.
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48 189 **Table 2. Working conditions and participants' job satisfaction**

49
50 190 Considering the types of patients, participants believed patients with
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53 191 difficult-to-diagnose diseases, serious diseases, and rare diseases should seek medical
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56 192 treatment in tertiary A hospitals. Most participants treated patients with common
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59 193 diseases, chronic diseases, and those seeking medicine; only about half of them were
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4 194 satisfied with the type of patients they met, which differed from whom they were
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6 195 expecting to treat more often. Participants felt that many of these patients should seek
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9 196 medical treatment in the community health system, especially patients with common
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11 197 and chronic diseases, and those seeking medicines. Further, about half of the
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14 198 participants thought patients' medical expenses were costly. Lastly, less than half of
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17 199 the participants felt respected by their patients (Table 3).

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

201 *Univariate Analysis of Job Satisfaction and its Influencing Factors*

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

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4 216 type of patients they treated ($\chi^2 = 49.153$), whether patients with common diseases
5
6 217 were the population doctors expected ($\chi^2 = 7.987$), whether patients with acute
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8 218 diseases were the population doctors expected ($\chi^2 = 7.830$), and the extent patients
9
10 219 respected doctors ($\chi^2 = 44.764$) (Tables 1–3).

220 *Logistic Regression Analysis of Job Satisfaction and its Influencing Factors*

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

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

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

237 **Discussion**

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4 238 Doctors' job satisfaction was influenced by their professional title, patient
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6 239 composition, and work stress. Some factors like department, work hours, patients'
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9 240 respect, and life stress were also related to doctors' job satisfaction.

11 241 First, unlike some studies in other countries and regions, demographic
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14 242 characteristics (e.g., sex and education background) were not influencing factors of
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17 243 job satisfaction^{38 39}. Only doctors' professional title played a role, which was
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19 244 supported by other studies in China⁵ and Canada⁴⁰. Junior doctors were less satisfied
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22 245 with their job, which may be attributed to many other factors. Because doctors'
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25 246 income was related to their professional title⁴¹, the annual income of junior doctors
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27 247 was always lower than that of senior doctors. However, studies have proposed that
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30 248 income positively influences doctors' job satisfaction^{2 5 20 42}. In addition, a study in the
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33 249 United Kingdom noted that young staff may fail to fully use their training, which
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35 250 could foster low satisfaction¹⁵. This can also be explained by opportunities to use
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38 251 one's abilities and personal accomplishments during daily work, which were other
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41 252 aspects impeding young staff from enjoying job satisfaction⁷. Moreover, junior
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43 253 doctors in China face additional difficulties, including an unfair promotion system⁴³.
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46 254 Furthermore, the new policy about specialist standardization training places more
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48 255 pressure on young staff, since it requires doctors to do an additional 2–4 years of
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51 256 specialist training after completing 3 years of resident standardization training⁴⁴.
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53 257 During this process, young doctors may become unsatisfied with their income and
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56 258 their inability to support their families, which, in turn, promotes further job
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59 259 dissatisfaction.

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4 260 Second, patient composition was a significant factor influencing doctors' job
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6 261 satisfaction. Around 51.2% of the doctors were satisfied with the type of patients they
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9 262 treated; however, 52.1% of the doctors mostly treated patients with common diseases
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11 263 every day. The low satisfaction seemed to reflect the gap between their expectations
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14 264 and the reality. Given that doctors in tertiary A public hospitals have the best
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17 265 professional abilities and hope to deal with the most difficult and complicated
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19 266 diseases, they expect to treat patients with difficult-to-diagnose diseases. However,
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22 267 unlike the two-way referral system in many developed countries (e.g., the United
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24 268 States), patients in China can choose the health institution they prefer⁴⁵. This causes
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27 269 overcrowding in tertiary A public hospitals⁴⁶, regardless of disease type. In fact, many
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30 270 patients with common, mild, or chronic diseases do not need to visit tertiary A public
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33 271 hospitals, as this wastes high-quality medical resources. Under these circumstances,
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36 272 doctors who wish to solve difficult-to-diagnose cases feel disappointed and
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38 273 dissatisfied with their work¹⁴. To solve this problem, hospital patient flow logistics
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41 274 should be controlled⁴⁷. Encouraging patients and doctors to accept the two-way
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44 275 referral is vital; however, the level of trust between doctors and patients is also
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46 276 critical. Moreover, it should be noted that inadequate time spent treating
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48 277 difficult-to-diagnose diseases has a negative effect on doctors' skill development,
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51 278 which can also cause doctors' job dissatisfaction. Policymakers and hospital
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54 279 administrators should provide more opportunities to doctors expecting more
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56 280 difficult-to-diagnose patients, especially junior doctors.

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58 281 Third, work stress was related to job satisfaction, which supported a past study⁵.

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4 282 However, we also found that relative work stress (i.e., comparing work stress to that
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6 283 in the past year) more significantly predicted job satisfaction than did present work
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9 284 stress. Doctors who felt greater relative work stress were more likely to be dissatisfied
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11 285 with their job than their counterparts. In addition, the factors that doctors consider as
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14 286 reflective of work stress, especially work intensity and social evaluation, require
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17 287 attention. Doctors working in tertiary A public hospitals usually undertake many
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19 288 clinical tasks; for example, because of the excess of patients, doctors have to diagnose
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21 289 and treat them as fast as possible, which limits doctors' ability to take breaks⁴⁸.
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24 290 Moreover, several doctors have been reported to die suddenly, possibly because of the
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27 291 work intensity⁴⁹. Similar studies in other countries have also stated that work intensity
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30 292 negatively affects job satisfaction^{14 38}. Moreover, improving their social evaluation
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33 293 may improve doctors' job satisfaction. At present, doctors in China do not have a
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36 294 good reputation because of some doctors pursuing personal economic interests by
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38 295 prescribing unnecessary medicine or tests for patients⁵⁰. It must be noted that there are
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41 296 many other doctors who do not resort to such unethical practices; however, they also
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44 297 become victims of this stigmatization. Our society should maintain an objective and
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46 298 impartial attitude towards most doctors and supervise those with a poor reputation.

47
48 299 Fourth, doctors' long work hours require attention. Working overtime has caused
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51 300 low job satisfaction worldwide, such as in Britain⁵¹, Spain⁵², and Switzerland⁴². Our
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54 301 finding was similar. Although the European Working Time Directive ruled that junior
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56 302 doctors should work no more than 48 hours per week⁵³, this was unrealistic in China.
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59 303 Doctors have to work overtime, which often limits their family time and spare time.
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4 304 However, a study proposed that work-private hours also play a key role in job
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6 305 satisfaction⁹. In addition, in Chinese hospitals, doctors' payment is based on their
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9 306 performance, indicating that meeting job requirements may be more critical than
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11 307 working long hours. Moreover, performance is critical for promotion, especially for
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14 308 junior doctors. Therefore, there is an urgent need to shorten doctors' weekly work
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17 309 hours and change the current promotion and income structure, which may promote
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19 310 increased job satisfaction⁵⁴.

21
22 311 Fifth, it is reasonable to assume that if doctors feel respected by patients, they
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24 312 will be more satisfied with their work. Respect from patients indicates that their
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27 313 professional abilities, personal characteristics, and good reputation are recognized. All
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30 314 of these good aspects would accelerate doctors' enthusiasms of their work, which then
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32 315 reflected as job satisfaction. However, due to the overcrowding of patients in tertiary
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35 316 A public hospitals, patients spend a long time waiting to register, pay, and fill
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37 317 prescriptions compared to the short time meeting the doctors. This unreasonable
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40 318 phenomenon has reduced patients' satisfaction and their respect for doctors, and
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43 319 sometimes even results in violence against doctors⁵⁵. Therefore, experiencing a poor
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46 320 patient-doctor relationship and violence from patients might lead to doctors' job
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48 321 dissatisfaction. To address this concern and improve the patient-doctor relationship,
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50 322 the number of patients visiting tertiary A public hospitals should be decreased. If
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53 323 patients with common or minor diseases are willing and encouraged to seek medical
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56 324 treatment in the community healthcare system, doctors at tertiary A hospitals can
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58 325 spend more time diagnosing, treating, and communicating with patients, while
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4 326 maintaining a positive and patient attitude⁵⁶.

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6 327 Lastly, other life stress is also related to job satisfaction, and problems such as
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9 328 depression and burnout require consideration⁵⁷. Work-family conflict should also be
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11 329 addressed to avoid job dissatisfaction⁵. Moreover, doctors' professional title and
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14 330 department might factor into their job satisfaction. Junior doctors might experience
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17 331 more life stress due to supporting their families; therefore, these doctors may require
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20 332 additional support. Doctors in different departments may also enjoy various
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23 333 extensions of job satisfaction²¹, indicating that hospital administrators should improve
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25 334 the working conditions to various degrees according to the doctors' departments.

26
27 335 There are two limitations to this study. First, due to doctors' unwillingness to
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30 336 answer questions about certain personal information, information on age distribution
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32
33 337 and income were not obtained, which made it impossible to explore the effects of
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36 338 these on job satisfaction. Second, this survey was only conducted in eleven tertiary A
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39 339 public hospitals in Shanghai, which limits generalizability. Future studies should
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41 340 include more hospitals and more possible factors.

42 341 **Conclusions**

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44
45 342 In conclusion, most doctors were not satisfied with their jobs in Shanghai, China,
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48 343 and this was mainly influenced by their professional title, patient composition, and
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51 344 work stress. To address this problem, policymakers and hospital administrators should
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54 345 establish the two-way referral system, improve the current promotion and income
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57 346 structure, pay more attention to less-experienced staff, and help doctors release their
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59 347 work stress.
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5

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21
22 355 This manuscript was jointly completed by JL, WY, TD, ML, and LZ. We must
23
24 356 point out that the four authors—JL, WY, TD, ML—contributed equally to this
25
26
27 357 research. Here are the specific efforts of each author. JL, WY, TD, ML made
28
29
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31
32
33 359 drafting the manuscript and revising it critically for important intellectual content. LZ
34
35
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37
38 361 final approval of the version to be published.
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41

42
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44

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Table 1. Participants' personal and job characteristics

	n (%)	Job satisfaction		χ^2	P-value
		Dissatisfaction n (%)	Satisfaction n (%)		
Sex		473 (64.8)	257 (35.2)	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				39.135	<0.0001
Very light	0 (0.0)	0 (0.0)	0 (0.0)		
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

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4	Whether departments once organized a community health lecture			1.542	0.214
5	No	465 (63.7)	309 (66.5)	156 (33.5)	
6	Yes	265 (36.3)	164 (61.9)	101 (38.1)	
7	Whether departments once participated in a volunteer medical				
8	consultation			0.213	0.644
9					
10	No	318 (43.6)	209 (65.7)	109 (34.3)	
11	Yes	412 (56.4)	264 (64.1)	148 (35.9)	
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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)		

526 Asterisk (*): MCQ means multiple-choice question. Participants can choose more
 527 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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4 **Supplementary Table 1. Multicollinearity analysis**

5 Variable	Tolerance	Variance Inflation 6 Factor
7 Sex	0.815	1.227
8 Education level	0.763	1.310
9 Position	0.702	1.425
10 Professional title	0.583	1.716
11 Department	0.762	1.313
12 Work hours per week (hours)	0.806	1.240
13 Whether the work within work hours met hospital requirements	0.886	1.129
14 Life stress	0.595	1.680
15 Work stress	0.473	2.116
16 Whether current work stress increased compared to that in the past year	0.737	1.356
17 Whether work intensity reflected work stress	0.717	1.394
18 Whether working long hours reflected work stress	0.741	1.350
19 Whether high expectations of patients reflected work stress	0.794	1.259
20 Whether high job risks reflected work stress	0.718	1.393
21 Whether a poor patient-doctor relationship reflected work stress	0.733	1.365
22 Whether a poor colleague relationship reflected work stress	0.768	1.303
23 Whether fierce competition of promotion reflected work stress	0.805	1.242
24 Whether a poor social evaluation reflected work stress	0.729	1.373
25 Whether social misunderstandings reflected work stress	0.697	1.435
26 Whether departments once organized a community health lecture	0.679	1.473
27 Whether departments once participated in a volunteer medical 28 consultation	0.657	1.523
29 Whether patients with any kinds of diseases should seek medical 30 treatment in tertiary A public hospitals	0.587	1.703
31 Whether patients with chronic diseases should seek medical treatment in 32 tertiary A public hospitals	0.508	1.969
33 Whether patients with rare diseases should seek medical treatment in 34 tertiary A public hospitals	0.440	2.271
35 Whether patients with common diseases should seek medical treatment 36 in tertiary A public hospitals	0.584	1.712
37 Whether patients with acute diseases should seek medical treatment in 38 tertiary A public hospitals	0.531	1.883
39 Whether patients with difficult-to-diagnose diseases should seek medical 40 treatment in tertiary A public hospitals	0.370	2.703
41 Whether patients with rehabilitation should seek medical treatment in 42 tertiary A public hospitals	0.599	1.669
43 Whether patients with serious diseases should seek medical treatment in 44 tertiary A public hospitals	0.383	2.609
45 Whether patients with chronic diseases were the most doctors treated in 46 work hours	0.675	1.481
47 Whether patients with rare diseases were the most doctors treated in 48 work hours	0.656	1.525

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3	work hours		
4	Whether patients with common diseases were the most doctors treated	0.587	1.704
5	in work hours		
6	Whether patients with rare diseases were the most doctors treated in	0.747	1.338
7	work hours		
8	Whether patients with difficult-to-diagnose diseases were the most	0.622	1.608
9	doctors treated in work hours		
10	Whether patients with rehabilitation diseases were the most doctors	0.689	1.451
11	treated in work hours		
12	Whether patients with serious diseases were the most doctors treated in	0.600	1.666
13	work hours		
14	Whether patients seeking medicine were the most doctors treated in	0.576	1.736
15	work hours		
16	Whether doctors were satisfied with types of patients they treated	0.787	1.270
17	Whether patients with chronic diseases were the population doctors	0.630	1.587
18	expected		
19	Whether patients with rare diseases were the population doctors	0.678	1.476
20	expected		
21	Whether patients with common diseases were the population doctors	0.655	1.527
22	expected		
23	Whether patients with acute diseases were the population doctors	0.770	1.298
24	expected		
25	Whether patients with difficult-to-diagnose diseases were the population	0.661	1.513
26	doctors expected		
27	Whether patients with rehabilitation diseases were the population	0.656	1.523
28	doctors expected		
29	Whether patients with serious diseases were the population doctors	0.601	1.665
30	expected		
31	Whether patients seeking medicine were the population doctors	0.810	1.234
32	expected		
33	Whether patients with chronic diseases should seek medical treatment in	0.721	1.387
34	the community health system		
35	Whether patients with rare diseases should seek medical treatment in the	0.751	1.332
36	community health system		
37	Whether patients with common diseases should seek medical treatment	0.822	1.216
38	in community health system		
39	Whether patients with acute diseases should seek medical treatment in	0.785	1.274
40	the community health system		
41	Whether patients with difficult-to-diagnose diseases should seek	0.697	1.435
42	medical treatment in the community health system		
43	Whether patients with rehabilitation diseases should seek medical	0.705	1.419
44	treatment in the community health system		
45	Whether patients with serious diseases should seek medical treatment in	0.639	1.565
46	the community health system		
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3	Whether patients seeking medicine should seek medical treatment in the	0.714	1.400
4	community health system		
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6	Evaluation of patients' medical expenses in tertiary A hospitals	0.859	1.164
7	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.