


# Personality and job satisfaction among Chinese health practitioners: The mediating role of professional quality of life

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## Abstract

This study aims to explore mediating effects of professional quality of life on the relationship between big-five personality traits and job satisfaction in a Chinese healthcare setting. A total of 1620 Chinese healthcare professionals were recruited to participate in a randomised cross-sectional survey. The results suggest that professional quality of life transmitted the effect of personality to job satisfaction. Specifically, compassion satisfaction and burnout mediated the positive effect of extraversion, agreeableness, conscientiousness, and openness upon job satisfaction; as well as mediated negative effects of neuroticism upon job satisfaction. Secondary traumatic stress mediated the positive effect of extraversion upon job satisfaction. The paper also discusses the cultural factors contributing to the mediating effects and implications offered by the study at the macro, meso, and micro levels.

## Keywords

burnout, compassion satisfaction, job satisfaction, personality, secondary traumatic stress

## Introduction

This study aims to explore mediating effects of professional quality of life on the relationship between big-five personality traits and job satisfaction among Chinese healthcare professionals. Health psychology has identified that there is a strong association between job satisfaction and mental or psychological problems. Workers with low levels of job satisfaction tend to experience emotional burnout, reduced levels of quality of life, and increased levels of anxiety and depression (Faragher et al., 2005). Research has also reported that job dissatisfaction is strongly correlated to emotional exhaustion among healthcare workers who are at high risk for burnout and work-related traumatic stress (Khamisa, 2015; Piko, 2006). Personality is regarded as one of the influencing factors for job satisfaction (Judge et al., 2002). However, there is limited understanding of the mechanism or process that underlines the relationship between personality and job satisfaction via professional quality of life that is affected by the levels of burnout and work-related traumatic stress, in particular in a Chinese healthcare setting.

Job satisfaction is defined as a pleasurable or positive emotional state resulting from the appraisal of one's job or

job experiences (Locke, 1976). Personality traits refer to the traits that are characteristic of a given individual, and therefore are instrumental in depicting that individual's personal uniqueness (McAdams, 2006). The big-five model has been the most widely employed and extensively studied model of personality (Costa and McCrae, 1992; Gosling et al., 2003). According to the big-five framework, personality traits can be understood by five basic tendencies—extraversion, openness, neuroticism, conscientiousness, and agreeableness (Costa and McCrae, 1992).

Accumulated literature supports the argument that job satisfaction is associated with personality (House et al., 1996; Judge et al., 2002). In their meta-analysis on the relationship between big-five personality and job satisfaction, Judge et al. (2002) concluded that the traits of extraversion,

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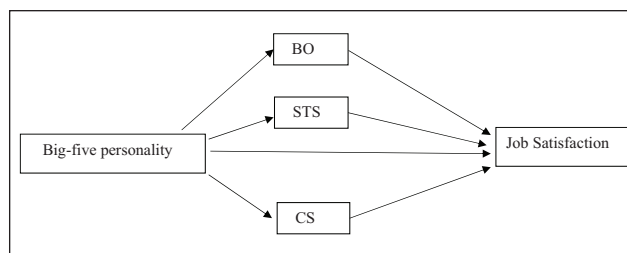
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conscientiousness, and openness were positively correlated to job satisfaction; neuroticism was negatively correlated to job satisfaction; and the correlation between agreeableness and job satisfaction was too weak to be identified. Results from research in non-Western countries also demonstrates that personality partially explains job satisfaction. For example, Templer (2012) reported that job satisfaction was positively correlated with agreeableness, conscientiousness, extraversion, and openness, while negatively correlated with neuroticism, in Singaporeans. Similarly, Zhai et al. (2013) study in China found that extraversion, agreeableness, conscientiousness, and openness were positively associated with job satisfaction, while neuroticism was negatively associated with job satisfaction.

Research exploring the relationship between big-five personality and job satisfaction among healthcare workers shows that job satisfaction is positively correlated to proactive personality traits, such as extraversion and openness; and negatively correlated to negative personality traits, such as neuroticism (Foulkrod et al., 2010; Haynie et al., 2007). Among all occupations, healthcare is considered to be one of the most stressful professions (Xie et al., 2020). Healthcare professionals often experience both negative and positive affectivities, including burnout (BO), secondary traumatic stress (STS), and compassion satisfaction (CS). Stamm (2010) used the term 'professional quality of life' (shortened hereafter to ProQOL) that includes these three components. BO refers to negative physical and emotional reactions to an individual's job resulting from prolonged exposure to a stressful work environment (Alarcon et al., 2009), such as in a hospital setting. STS is the stress derived from helping a traumatised or suffering patient in a healthcare setting (Figley, 2002). As a positive affectivity, CS in healthcare settings refers to the pleasure and joy resulting from being able to help patients, and positive feelings about one's ability to contribute to the work setting or even the greater good of society (Stamm, 2010).

The associations between BO, personality traits, and job satisfaction have been established in literature. Research suggests that proactive personality traits such as extraversion, conscientiousness, and agreeableness are negatively associated with BO. Negative personality traits, such as neuroticism, are positively correlated to BO (Alarcon et al., 2009; Barr, 2018). Research into the mediating role of BO in the relationship between personality and job satisfaction in healthcare settings is limited. However, Kim et al. (2016) reported that a type D personality (which reflects the combination of negative affectivity and social inhibition), was significantly associated with job satisfaction via the effect of BO in clinical nurses. BO thus appears to mediate the negative effects of type D personality and job satisfaction.

Research also establishes the associations between STS, personality traits, and job satisfaction. Studies report that STS is negatively correlated to extraversion, openness, agreeableness, and conscientiousness, whereas positively



**Figure 1.** Conceptual model of the hypothesized and tested mediating effects.

correlated to neuroticism among healthcare workers (Mairean, 2016; Teel et al., 2019). However, another study found that only neuroticism positively correlated to STS (Barr, 2018). A negative correlation was found between STS and job satisfaction (Bride and Kintzle, 2011; Pizzolon et al., 2019). Kim et al. (2016) investigated the mediating effect of compassion fatigue (which is comprised of BO and STS) on the relationship of type D personality and job satisfaction. They found that compassion fatigue did not mediate the negative relationship between type D personality and job satisfaction.

Research indicates that there are significant relationships between CS, personality traits, and job satisfaction. It has been reported that CS is positively correlated to extraversion, openness, agreeableness, and conscientiousness while negatively correlated to neuroticism (Barr, 2018; Leung et al., 2013). With regards to the mediating effect of CS on the relationship between personality and job satisfaction, Kim et al. (2016) reported that CS was a mediator for the negative relationship between type D personality and job satisfaction.

In summary, significant associations between ProQOL, personality, and job satisfaction are reported. Moreover, ProQOL appears to have mediating effects on the relationship between personality and job satisfaction. Therefore, personality may offer a unique pathway to lower or higher job satisfaction via ProQOL. Figure 1 presents the conceptual model that shows the pathway.

Although ProQOL (Stamm, 2010) is widely used to measure BO, STS, and CS in the healthcare literature, the adequacy of the three-factor structure has been questioned by researchers. For example, Heritage et al. (2018) found that the measurement adequacy was found in CS; but that BO and STS failed to demonstrate adequate construct validity. Geoffrion et al. (2019) reported that the goodness-of-fit indices showed that the three-factor model was poor fitting, and proposed a bifactor model. The bifactor model is comprised of a factor structure with a general factor of ProQOL in addition to three factors of CS, BO, and STS. The bifactor model highlights the unidimensionality of ProQOL, whereas allows each subscale to be used separately. This bifactor model has not been tested in a Chinese sample.

Moreover, theoretical debates on whether burnout is a form of depression or a psychological phenomenon that

reflects one's ProQOL have prevailed in recent years (Bianchi et al., 2015; Schonfeld and Bianchi, 2016; Schonfeld and Verkuilen, 2019). Research has found that BO and depression were strongly correlated (Schonfeld and Bianchi, 2016; Xie et al., 2020). Despite the fact that there are no biological markers being found in BO, BO has progressively been regarded as a hypocortisolemic disorder (Bianchi et al., 2015). Schaufeli et al. (2003) proposed that BO can be considered a mental disorder so as to clinically differentiate it from other mental disorders such as depression. Schonfeld and Bianchi (2016) offer some support to Schaufeli et al.'s proposal, as they found that when BO was treated as a diagnostic category, distinct differences were observed between the BO and BO-free groups in the total scores of the Patient Health Questionnaire-9 (PHQ-9) and the scores on each PHQ-9 symptom item. However, they also suggested that the notion of developing BO and depression alongside each other was premature because a clear clinical distinction between the two constructs was absent in their study (Schonfeld and Bianchi, 2016). Similarly, in their systematic review of 92 empirical studies on the BO-depression overlap, Bianchi et al. (2015) reported that the evidence for the singularity of the burnout phenomenon was inconsistent; and the distinction between burnout and depression was partly supported by empirical research. Considering that no definite conclusions regarding the BO-depression overlap have been reached, the definition and measurement of BO in Stamm's ProQOL are used in the present study.

It is also worth noting that there is some overlap between ProQOL and job satisfaction; for example, between CS and job satisfaction. However, CS and job satisfaction are two different constructs. While emphasizing on several aspects of satisfaction with work and bearing similarity with job satisfaction, CS measured by ProQOL (Stamm, 2010) focuses on one's satisfaction derived from performing helping or caring behaviours at work and the broader societal value attached to the worker's career as a helper (Heritage et al., 2018). Job satisfaction measured by the Minnesota Job Satisfaction Scale is defined by how satisfied people are with their current jobs in areas such as ability utilisation, work activities, authority, workplace policies and practices, compensation, job security, and social status (Weiss et al., 1967). Kim et al. (2016) have provided empirical support to investigate the mediating effect of ProQOL on the relationship between Type D personality and job satisfaction.

To our knowledge, no existing studies have examined the conceptualised mediating effects of ProQOL on big-five personality and job satisfaction, as shown in Figure 1, in a Chinese healthcare setting. The present study aims to address the research gap, while also testing the bifactor model of ProQOL when exploring the construct validity of ProQOL. Built upon the existing literature, it is hypothesised that:

H1: BO, STS, and CS would mediate the positive effect of extraversion upon job satisfaction;

H2: BO, STS, and CS would mediate the positive effect of agreeableness upon job satisfaction;

H3: BO, STS, and CS would mediate the positive effect of conscientiousness upon job satisfaction;

H4: BO, STS, and CS would mediate the negative effect of neuroticism upon job satisfaction; and

H5: BO, STS, and CS would mediate the positive effect of openness upon job satisfaction.

## Method

### Participants

A randomised cross-sectional survey was designed to collect data between January and May 2017. A random sampling with 1620 participants were recruited from eight state-owned hospitals in a city in southern China. A total of 1562 questionnaires were returned with a response rate of 96.4%. The final valid sample was 1423. Table 1 presents the demographic characteristics of the participants.

### Measures

**Demographic characteristics.** The demographic questionnaire included questions of gender, age, marriage status, education, professional position in the hospital, professional title, annual income, and weekly working hours.

**Personality.** Personality was measured using the Chinese version of the 44-item Big Five Inventory (BFI) (John and Srivastava, 1999). BFI consists of five subscales that present five trait dimensions of personality: 8-item extraversion, 9-item agreeableness, 9-item conscientiousness, 8-item neuroticism, and 9-item openness to experience, with a Likert scale from 1 = Strongly disagree to 5 = Strongly agree. Sample items for the five subscales included: "I see myself as someone who is talkative" (extraversion); "I see myself as someone who is helpful and unselfish with others" (agreeableness); "I see myself as someone who does a thorough job" (conscientiousness); "I see myself as someone who is depressed, blue" (neuroticism); and "I see myself as someone who is original, comes up with new ideas" (openness). The Cronbach's alphas of the Chinese BFI demonstrated good internal consistency with values ranging from 0.70 to 0.81 (Carciofo et al., 2016). In this study, Cronbach's alphas for extraversion, agreeableness, conscientiousness, neuroticism, and openness were 0.60, 0.75, 0.76, 0.79, and 0.70 respectively. For cross-cultural comparison purposes, no items in the extraversion subscale were removed to increase the Cronbach's alpha.

**Table 1.** The demographic characterizers of the participants.

Demographic factors		N	%
Gender	Male	325	22.8
	Female	1098	77.2
	Total	1423	100
Age	20–29	561	39.4
	30–39	492	34.6
	40–49	268	18.8
	50–59	76	5.3
	60–69	26	1.8
	Total	1423	100
Marriage status	Single	423	29.7
	Married/ Defector	966	66.3
	Divorced/Separated/ Widowed	34	2.4
	Total	1423	100
Education	Lower than undergraduate	404	28.4
	Undergraduate	857	60.2
	Masters	144	10.1
	Medical doctorate	15	1.1
	Other doctorate	3	0.2
	Total	1423	100
	Professional position in the hospital	Doctor	459
Nurse		861	60.5
Pharmacist		73	5.1
Intern		30	2.1
Total		1423	100
Professional title	Senior professional post	41	2.9
	Associate senior professional post	154	10.8
	Intermedium professional post	411	28.9
	Junior professional post	817	57.4
	Total	1423	100
Annual income	Less than ¥50,000	305	21.4
	¥50,001–¥100,000	610	42.9
	¥100,001–¥150,000	269	18.9
	¥150,001–¥200,000	153	10.8
	¥200,001–¥300,000	41	2.9
	¥300,001–¥400,000	9	0.6
	¥400,001–¥500,000	29	2.0
Higher than ¥500,001	7	0.5	
Average weekly working hours	Up to 40 hours	404	28.4
	41–50 hours	807	56.7
	51–60 hours	142	10.0
	Over 60 hours	70	4.9
	Total	1423	100

Annual income was in RMB. 1RMB = 0.14USD roughly at the time of data collection.

**ProQOL.** The adopted Chinese version of Stamm's (2010) 30-item Professional Quality of Life (ProQOL) scale was used to measure BO, STS, and CF with 10 items for each subscale with a Likert scale ranging from 1 = Never to 5 = Very often. Example items include "I feel worn out because of my work as a health practitioner" (BO), "I think that I might have been affected by the traumatic stress of those I help" (STS) and "I like my work as a health practitioner"

(CS). The higher the score, the higher the level of BO, STS, or CS. The Cronbach's alphas of the three subscales were 0.75, 0.81, and 0.88 for BO, STS, and CS, respectively (Stamm, 2010). In this study, Cronbach's alphas for BO, STS, and CS were 0.73, 0.79, and 0.86. The correlated 3-factor CFA showed an unsatisfactory fit to the data,  $\chi^2/df = 8.985$ , CFI = 0.834, RMSEA = 0.075, LO 90%CI = 0.072, HI 90%CI = 0.077, PCLOSE = 0.000. The bifactor CFA (BCFA; Geoffrion et al., 2019), where items of BO and STS were reversed so as to represent positive QOL items, demonstrated a fair fit model,  $\chi^2/df = 4.319$ , CFI = 0.877, RMSEA = 0.048, LO 90%CI = 0.046, HI 90%CI = 0.051, PCLOSE = 0.867, suggesting that the construct validity of the measures were acceptable. The three factors (CS, BO, and STS) of the bifactor model approximated the three-dimensional framework of ProQOL (Geoffrion et al., 2019).

**Job satisfaction.** Job satisfaction was measured by the adopted Chinese version of the 20-item Minnesota Satisfaction Questionnaire (MSQ) (Weiss et al., 1967) with a Likert scale from 1 = Very dissatisfied to 5 = Very satisfied. A sample item was "On my present job, this is how I feel about the freedom to use my own judgement." The C-MSQ demonstrated good internal consistency with a Cronbach's alpha of 0.93 (Ge et al., 2011). In this study, Cronbach's alpha for C-MSQ was 0.92.

### Procedure

Ethical approval for the current research was obtained from the Human Research Ethics Committee of XXX University (Ref. H5824). An information sheet was provided to the potential participants. The participants completed the pen-and-paper survey after signing the informed consent.

### Statistical analysis

Data analysis was performed using IBM's SPSS version 25. Parallel multiple mediator models were used for mediation analysis using the PROCESS v3.1 macro for SPSS with 5000 resamples to bootstrap 95% confidence intervals (Hayes, 2018). To exclude the effects of five independent variables (IVs; extraversion, agreeable, conscientiousness, neuroticism, and openness) on one another, the personality traits were not included in the model simultaneously. Instead, five mediator models, each with one single personality trait, were performed.

Tolerance and VIF were used to identify multicollinearity. For all IVs, the VIF values were < 2.50 (less than the cut-off point of 10) and the tolerance values were > 0.40 (larger than the cut-off point of 0.10), suggesting that the multicollinearity assumption was not violated.

To control the covariates in the mediation models, independent samples of T-test and ANOVA were performed to

**Table 2.** Intercorrelations.

Variables	1	2	3	4	5	6	7	8	9	M	SD
1. Extraversion	–	0.40**	0.46**	–0.51**	0.43**	–0.38**	–0.18**	0.35**	0.33**	25.59	3.44
2. Agreeableness		–	0.63**	–0.56**	0.23**	–0.34**	–0.21**	0.30**	0.37**	32.74	4.17
3. Conscientiousness			–	–0.61**	0.36**	–0.35**	–0.19**	0.34**	0.40**	30.95	4.28
4. Neuroticism				–	–0.30**	0.51**	0.40**	–0.33**	–0.44**	21.67	4.45
5. Openness					–	–0.25**	–0.07*	0.36**	0.33**	31.34	4.08
6. BO						–	0.56**	–0.51**	–0.57**	27.67	5.25
7. STS							–	–0.003	–0.29**	27.57	5.97
8. CS								–	0.46**	33.05	4.89
9. Job Satisfaction									–	69.39	10.6

\*\* $p < 0.01$  level (2-tailed).

\* $p < 0.05$  level (2-tailed).

Bootstrap results were based on 5000 bootstrap samples.

determine which demographic factors of gender, age, education, and income had statistical differences in all variables under investigation. These were age ( $F(4,1418) = 2.96, p = 0.02$ ) and education ( $F(4,1418) = 3.05, p = 0.02$ ) differences in BO; age ( $F(4,1418) = 2.96, p = 0.02$ ), education ( $F(4,1418) = 11.01, p < 0.001$ ), and income ( $F(7, 1415) = 6.01, p < 0.001$ ) differences in STS; education ( $F(4,1418) = 3.05, p = 0.02$ ) and income ( $F(7,1415) = 4.28, p < 0.001$ ) differences in CS; income differences in job satisfaction ( $F(7, 1415) = 1.73, p < 0.01$ ); a gender ( $t(1421) = 2.83, p = 0.005$ ) difference in openness; age ( $F(4,1418) = 4.33, p = 0.002$ ), education ( $F(4,1418) = 4.05, p = 0.003$ ), and income ( $F(7,1415) = 2.87, p = 0.006$ ) differences in agreeableness; an income difference in conscientiousness ( $F(7,1415) = 2.83, p = 0.006$ ). The correlation tests indicated that the number of weekly working hours was negatively correlated to CS, job satisfaction, extraversion, agreeableness, conscientiousness, and openness; and positively associated with BO, STS, and neuroticism. Hence, age, gender, education, income, and weekly working hours were entered as covariates in the mediation models to remove a confounding threat to the associations among the variables (Hayes, 2018).

## Results

### Descriptive data

Table 2 shows Means, SDs, and intercorrelations among the variables. The five personality constructs were associated with one another with medium to large effects. Extraversion, agreeableness, conscientiousness, openness, and CS were all positively correlated to job satisfaction. Neuroticism, BO, and STS were negatively correlated to job satisfaction. Extraversion, agreeableness, conscientiousness, and openness were all negatively correlated to BO and STS, and positively correlated to CS. Neuroticism was positively correlated to BO and STS, and negatively correlated to CS.

### Testing of hypotheses

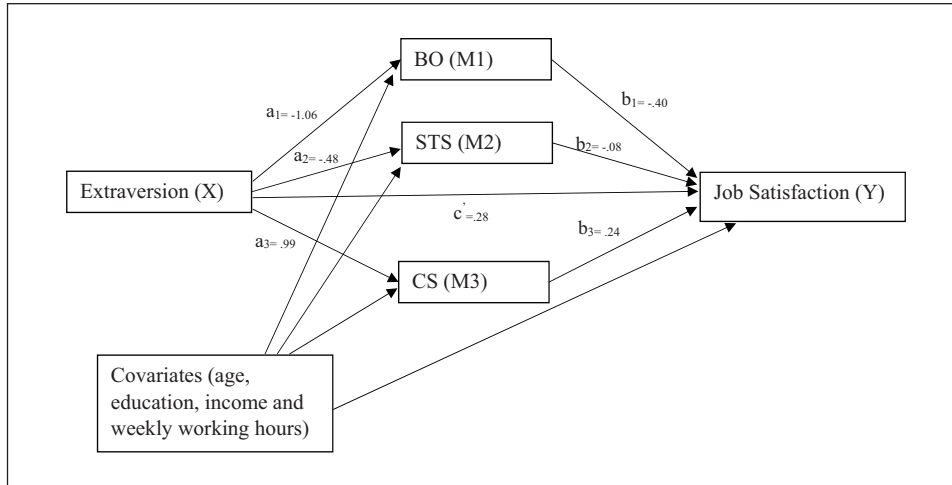
*H1: BO, STS, and CS would mediate the positive effect of extraversion upon job satisfaction*

A statistical diagram of the model tested for H1 is presented in Figure 2. Direct and indirect effects for each model are reported in Table 3. The total effect of extraversion on job satisfaction was significant,  $F(6, 1416) = 32.07, p < 0.001$ . The total amount of variance accounted for by the overall model was 12.0%. Meanwhile, the total direct effect of extraversion on job satisfaction was significant,  $F(9, 1413) = 93.46, p < 0.001$ . The total amount of variance accounted for by the overall direct effect model was 37.3%.

The indirect effect of extraversion on job satisfaction through BO was significant. Due to both a1 and b1 being negative, the mediation effect became positive. That is to say, greater extraversion was associated with lower BO, which in turn was associated with greater job satisfaction. The indirect effect of extraversion on job satisfaction through STS was also significant. Similar to BO, due to both a2 and b2 being negative, the mediation effect became positive. That is to say, greater extraversion was associated with lower STS, which in turn was associated with greater job satisfaction. The indirect effect of extraversion on job satisfaction through CS were both positive and significant, meaning that, in the sample, greater extraversion was associated with greater CS, which in turn was associated with greater job satisfaction. Hence, H1 was supported.

*H2: BO, STS, and CS would mediate the positive effect of agreeableness upon job satisfaction*

A statistical diagram of the model tested for H2 is presented in Figure 3. Direct and indirect effects for each model are reported in Table 4. The total effect of agreeableness on job satisfaction was significant,  $F(6, 1416) = 42.20, p < 0.001$ .

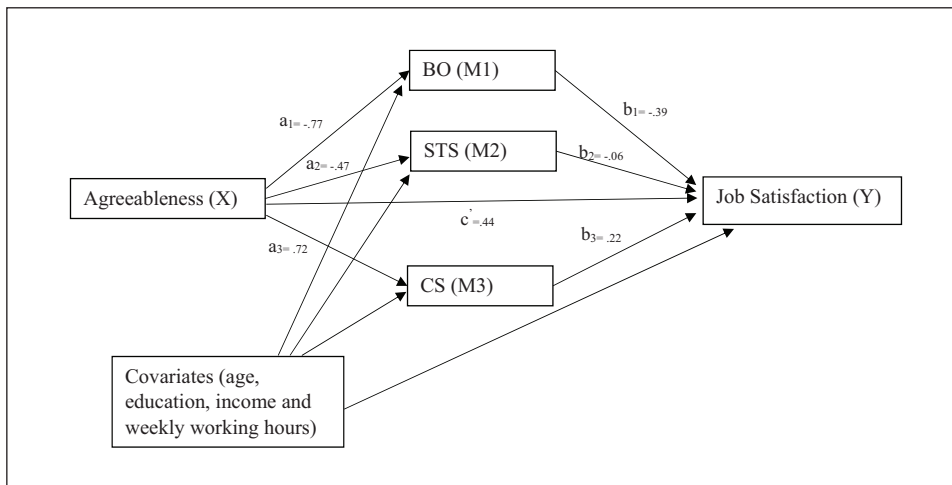


**Figure 2.** A statistical diagram of assessing the effect of extraversion personality on job satisfaction through three ProQOL mediators.

**Table 3.** Path coefficients, indirect effects, and 95%CI of extraversion predicting Job satisfaction through ProQOL (N= 1423).

Path	Coeff.	SE	BootLLCI	BootULCI	t
Direct effect (c')	0.28	0.07	0.14	0.42	3.96***
a1	-1.06	0.07	-1.20	-0.92	-15.05***
a2	-0.48	0.08	-0.62	-0.33	-6.40***
a3	0.09	0.07	0.85	1.13	13.72***
b1	-0.40	0.04	-0.46	-0.33	-11.24***
b2	-0.08	0.03	-0.14	-0.02	-2.72**
b3	0.24	0.03	0.19	0.30	8.35***
Indirect effect	<b>0.70</b>	0.05	<b>0.60</b>	<b>0.80</b>	
a1b1	<b>0.42</b>	0.05	<b>0.33</b>	<b>0.52</b>	
a2b2	<b>0.04</b>	0.02	<b>0.01</b>	<b>0.07</b>	
a3b3	<b>0.24</b>	0.04	<b>0.17</b>	<b>0.31</b>	

\*\*\*p < 0.001; \*\*p < 0.01 confidence intervals based on 5000 resamples.  
 Note. Significant indirect effects are presented in bold.



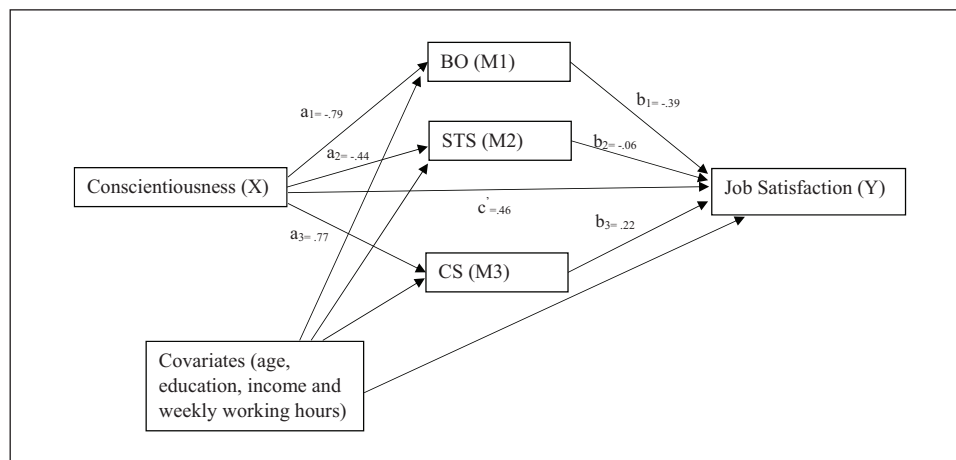
**Figure 3.** A statistical diagram of assessing the effect of agreeableness personality on job satisfaction through three ProQOL mediators.

**Table 4.** Path coefficients, indirect effects, and 95%CI of agreeableness predicting Job satisfaction through ProQOL ( $N = 1423$ ).

Path	Coeff.	SE	BootLLCI	BootULCI	t
Direct effect (c')	<b>0.44</b>	0.06	0.33	0.55	7.67***
a1	-0.77	0.06	-0.88	-0.65	-12.97***
a2	-0.47	0.07	-0.59	-0.35	-7.76***
a3	0.72	0.06	0.60	0.84	11.97***
b1	-0.39	0.03	-0.12	-0.04	-2.08*
b2	-0.06	0.03	-0.14	-0.02	-2.72**
b3	0.22	0.03	0.17	0.28	7.74***
Indirect effect	<b>0.49</b>	0.04	<b>0.41</b>	<b>0.57</b>	
a1b1	<b>0.30</b>	0.04	<b>0.23</b>	<b>0.38</b>	
a2b2	0.03	0.02	0.00	0.06	
a3b3	<b>0.16</b>	0.03	<b>0.11</b>	<b>0.21</b>	

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$ ; confidence intervals based on 5000 resamples.

Note. Significant indirect effects are presented in bold.



**Figure 4.** A statistical diagram of assessing the effect of conscientiousness personality on job satisfaction through three ProQOL mediators.

The total amount of variance accounted for by the overall model was 15.2%. Meanwhile, the total direct effect of agreeableness on job satisfaction was significant,  $F(9, 1413) = 101.04, p < 0.001$ . The total amount of variance accounted for by the overall direct effect model was 39.2%.

The indirect effect of agreeableness on job satisfaction through BO was significant. Due to both a1 and b1 being negative, the mediation effect became positive. As such, greater agreeableness was associated with lower BO, which in turn was associated with greater job satisfaction. The indirect effect of agreeableness on job satisfaction through CS were both positive and significant, meaning that greater agreeableness was associated with greater CS, which in turn was associated with greater job satisfaction. There was no evidence that agreeableness influenced job satisfaction by changing STS. Therefore, H2 was partially supported.

*H3: BO, STS, and CS would mediate the positive effect of conscientiousness upon job satisfaction*

A statistical diagram of the model tested for H3 is presented in Figure 4. Direct and indirect effects for each model are reported in Table 5. The total effect of conscientiousness on job satisfaction was significant,  $F(6, 1416) = 47.28, p < 0.001$ . The total amount of variance accounted for by the overall model was 16.7%. Meanwhile, the total direct effect of conscientiousness on job satisfaction was significant,  $F(9, 1413) = 102.55, p < 0.001$ . The total amount of variance accounted for by the overall direct effect model was 39.5%.

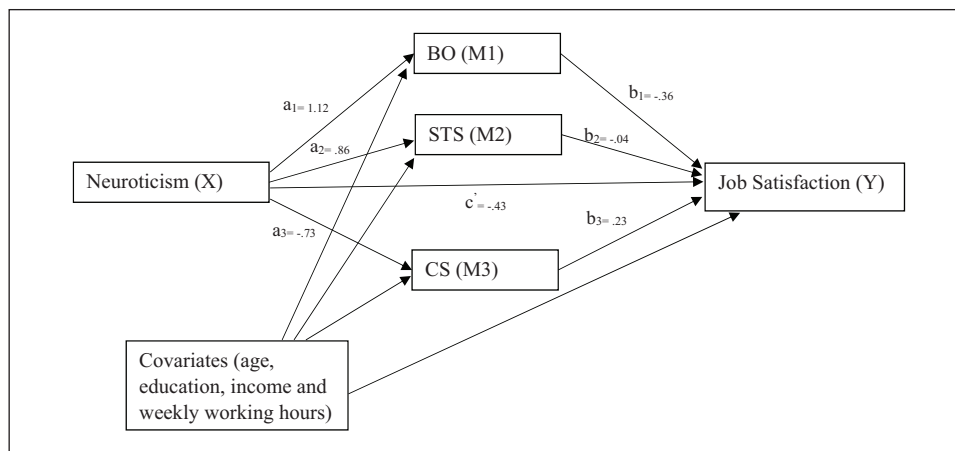
The indirect effect of conscientiousness on job satisfaction through BO was significant. Due to both a1 and b1 being negative, the mediation effect became positive. That is, greater conscientiousness was associated with lower BO, which in turn was associated with greater job satisfaction. The indirect effect of conscientiousness on job satisfaction through CS were both positive and significant meaning that greater conscientiousness was associated with greater CS, which in turn was associated with greater job satisfaction. There was no evidence that conscientiousness

**Table 5.** Path coefficients, indirect effects, and 95%CI of conscientiousness predicting Job satisfaction through ProQOL ( $N = 1423$ ).

Path	Coeff.	SE	BootLLCI	BootULCI	t
Direct effect (c')	0.46	0.06	0.35	0.57	8.22***
a1	-0.79	0.06	-0.90	-0.68	-13.68***
a2	-0.44	0.06	-0.56	-0.32	-7.37***
a3	0.77	0.06	0.65	0.88	13.13***
b1	-0.39	0.03	-0.45	-0.32	-11.31***
b2	-0.06	0.03	-0.12	-0.01	-2.17**
b3	0.22	0.03	0.16	0.27	7.50***
Indirect effect	<b>0.50</b>	0.04	<b>0.42</b>	<b>0.58</b>	
a1b1	<b>0.31</b>	0.04	<b>0.24</b>	<b>0.38</b>	
a2b2	0.03	0.02	0.00	0.06	
a3b3	<b>0.17</b>	0.03	<b>0.11</b>	<b>0.22</b>	

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$  confidence intervals based on 5000 resamples.

Note. Significant indirect effects are presented in bold.



**Figure 5.** A statistical diagram of assessing the effect of neuroticism personality on job satisfaction through three ProQOL mediators.

influenced job satisfaction by changing STS. Thus, H3 was partially supported.

*H4: BO, STS, and CS would mediate the negative effect of neuroticism upon job satisfaction*

A statistical diagram of the model tested for H4 is presented in Figure 5. Direct and indirect effects for each model are reported in Table 6. The total effect of neuroticism on job satisfaction was significant,  $F(6, 1416) = 61.43, p < 0.001$ . The total amount of variance accounted for by the overall model was 20.7%. Meanwhile, the total direct effect of conscientiousness on job satisfaction was significant,  $F(9, 1413) = 99.92, p < 0.001$ . The total amount of variance accounted for by the overall direct effect model was 38.9%.

The indirect effect of neuroticism on job satisfaction through BO was both negative and significant, meaning that greater neuroticism was associated with higher BO, which

in turn was associated with lower job satisfaction. The indirect effect of neuroticism on job satisfaction through CS were both negative and significant, meaning that greater neuroticism was associated with lower CS, which in turn was associated with lower job satisfaction. There was no evidence that neuroticism influenced job satisfaction by changing STS. Therefore, H4 was partially supported.

*H5: BO, STS, and CS would mediate the positive effect of openness upon job satisfaction*

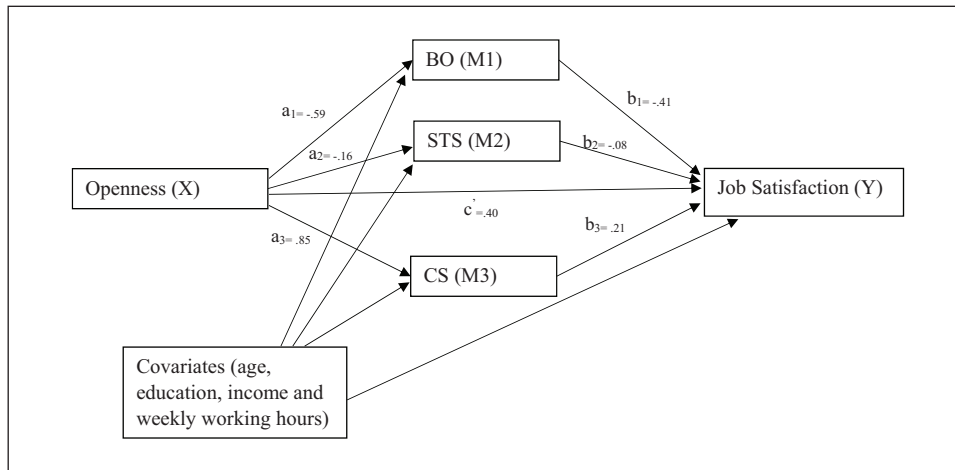
A statistical diagram of the model tested for H5 is presented in Figure 6. Direct and indirect effects for each model are reported in Table 7. The total effect of openness on job satisfaction was significant,  $F(6, 1416) = 32.69, p < 0.001$ . The total amount of variance accounted for by the overall model was 12.2%. Meanwhile, the total direct effect of openness on job satisfaction was significant,  $F(9, 1413) = 99.08, p < 0.001$ . The total amount of



**Table 6.** Path coefficients, indirect effects, and 95%CI of neuroticism predicting Job satisfaction through ProQOL (N= 1423).

Path	Coeff.	SE	BootLLCI	BootULCI	t
Direct effect (c')	-0.43	0.06	-0.55	-0.31	-7.25***
a1	1.12	0.05	1.02	1.22	22.06***
a2	0.86	0.05	0.76	0.97	15.99***
a3	-0.73	0.06	-0.84	-0.62	-13.06***
b1	-0.36	0.04	-0.43	-0.29	-10.34***
b2	-0.04	0.03	-0.10	0.02	-1.31
b3	0.23	0.03	0.17	0.29	8.06***
Indirect effect	<b>-0.61</b>	0.04	<b>-0.70</b>	<b>-0.53</b>	
a1b1	<b>-0.41</b>	0.05	<b>-0.50</b>	<b>-0.32</b>	
a2b2	-0.03	0.03	-0.09	0.02	
a3b3	<b>-0.17</b>	0.03	<b>-0.22</b>	<b>-0.12</b>	

\*\*\*p < 0.001; \*\*p < 0.01 confidence intervals based on 5000 resamples.  
 Note. Significant indirect effects are presented in bold.



**Figure 6.** A statistical diagram of assessing the effect of openness personality on job satisfaction through three ProQOL mediators.

**Table 7.** Path coefficients, indirect effects, and 95%CI of openness predicting Job satisfaction through ProQOL (N = 1423).

Path	Coeff.	SE	BootLLCI	BootULCI	t
Direct effect (c')	0.40	0.06	0.29	0.57	6.91***
a1	-0.59	0.07	-0.71	-0.47	-9.50***
a2	-0.16	0.06	-0.28	-0.03	-2.44*
a3	0.85	0.06	0.73	0.97	13.98***
b1	-0.41	0.03	-0.47	-0.34	-11.86***
b2	-0.08	0.03	-0.14	-0.02	-2.74**
b3	0.21	0.03	0.16	0.27	7.28***
Indirect effect	<b>0.43</b>	0.04	<b>0.35</b>	<b>0.52</b>	
a1b1	<b>0.24</b>	0.03	<b>0.18</b>	<b>0.31</b>	
a2b2	0.01	0.01	0.00	0.03	
a3b3	<b>0.18</b>	0.03	<b>0.12</b>	<b>0.24</b>	

\*\*\*p < 0.001; \*\*p < 0.01; \*p < 0.05; confidence intervals based on 5000 resamples.  
 Note. Significant indirect effects are presented in bold.

variance accounted for by the overall direct effect model was 38.7%

The indirect effect of openness on job satisfaction through BO was significant. Due to both  $a_1$  and  $b_1$  being negative, the mediation effect became positive; namely, greater openness was associated with lower BO, which in turn was associated with greater job satisfaction. The indirect effect of openness on job satisfaction through CS were both positive and significant. This means that greater conscientiousness was associated with greater CS, which in turn was associated with greater job satisfaction. There was no evidence that openness influenced job satisfaction by changing STS. H5 was thus partially supported.

## Discussion

The purpose of the present research was to examine the mediating effect of ProQOL on the relationship between personality and job satisfaction in a large random sample of healthcare professionals in China. The results suggest that ProQOL can transmit the effect of personality to either increase or decrease job satisfaction. Specifically, CS and BO mediated the positive effect of extraversion, agreeableness, conscientiousness, and openness upon job satisfaction; as well as mediated negative effects of neuroticism upon job satisfaction. STS mediated the positive effect of extraversion upon job satisfaction. The findings offer additional evidence of the underlying mechanisms of the observed association between personality traits and job satisfaction. Although previous research has documented associations among personality, ProQOL, and job satisfaction (House et al., 1996; Jones et al., 2015; Judge et al., 2002; Templer, 2012; Zhai et al., 2013), no previous work has conceptualised the relationships among these variables as a group to test the proposed mediating effect within a Chinese healthcare context. Before moving to the discussion of direct and indirect effects of ProQOL, the discussion on the results of mean differences in the variables under investigation, descriptive data, and construct structure of ProQOL is provided.

The T-test and ANOVA analyses indicated that demographic factors of gender, age, education, and income had statistical differences in BO, STS, CS, job satisfaction, openness, agreeableness, and conscientiousness. In relation to ProQOL and job satisfaction, participants who were older were at higher risks of BO and STS; people with higher levels of education had higher levels of BO, STS, and CS; and participants who had higher levels of income had higher levels of STS, CS, and job satisfaction. Healthcare professionals' age, qualifications, and income often reflect their experience and skills in the sector. More experienced and skilled doctors and nurses are likely to take more responsibilities and higher workloads, which might result in higher levels of BO and STS. Research has reported that Chinese workers value job security and a

good income more than their counterparts in Western countries (Zhang et al., 2019). Higher qualifications are likely to lead to higher income. As such, healthcare professionals with higher levels of qualification and income appear to have a higher level of job satisfaction.

With regards to personality traits, female participants had higher mean scores compared to their male counterparts; age, education, and income levels were positively associated with agreeableness; and participants with higher levels of income had higher scores in conscientiousness. Contrary to existing literature on gender differences in personality traits; which suggests that women often score higher in extraversion, agreeableness, conscientiousness and neuroticism, and no significant gender differences are typically found on openness (Costa et al., 2001; Lippa, 2010; Weisberg et al., 2011), the present study found that women scored higher only in openness. The reason for this contradiction remains unclear and warrants future studies. Older age, and higher education and income levels may be indicative of maturity, where people are more cautious and agreeable, more self-disciplined, better organised, and more able to control impulses and exert self-control to follow rules or maintain goal pursuit (Lippa, 2010). These characteristics reflect agreeableness and conscientiousness traits, which may explain the finding in relation to age, education and income levels, agreeableness, and conscientiousness.

The descriptive data analysis showed that effects of the correlations between the five personality constructs were at medium to large levels. This finding is inconsistent with van der Linden et al. (2010) result of a meta-analysis on the Big Five intercorrelations based on a large sample ( $n=144,117$ ). van der Linden et al. found that the Big Five personality traits were intercorrelated to one another with low or lower-medium effects, and openness was not associated with conscientiousness or neuroticism. Several factors may contribute to the inconsistency. First, the consistency may be caused by the different measurements used. The present study used the BFI, while the studies in van der Linden et al.'s meta-analysis employed the NEO Five Factor Inventory (NEO-FFI), NEO Personality Inventory (NEO-PI) and its revised version (NEO-PI-R), BFI, or the International Personality Item Pool (IPIP), and other less frequently used personality measures. Second, the difference in sample composition may contribute to the inconsistency. The sample of the present study was comprised of healthcare workers, while the samples in van der Linden et al.'s meta-analysis consisted of undergraduate students, employees from several occupations, mixed samples consisting of adults with or without jobs, children or young adolescents, and psychiatric patients. Third, cultural differences may be a contributing factor. There is no information specifying in which countries the data were collected in van der Linden et al.'s paper. However, considering that the meta-analysis was based on English publications, the large

proportion of the participants were likely to be non-Chinese. The intercorrelations between the five personality constructs in the present study have theoretical implications in personality research—the possible existence of a general factor in the Big Five model of personality in Chinese people, which warrants future investigation.

The CFA analysis of ProQOL lends support to the bifactor model of ProQOL. Similarly to Geoffrion et al. (2019) study, the CFA in the present study was unsuccessful in endorsing the adequacy of the three-factor structure suggested by Stamm (2010). The bifactor model with a general factor and three independent factors of CS, BO, and STS showed an acceptable model fit, which offers empirical support to the construct validity of ProQOL and the theoretical underpinnings of the scale (Geoffrion et al., 2019). It is pertinent to point out that the value of CFI (=0.88) in the present study was slightly lower than the threshold of CFI > 0.90 suggested in the model fit indices, which warrants further studies to explore which item(s) contributing to the low CFI.

The mediation analyses showed that extraversion, agreeableness, conscientiousness, and openness had positive direct effects on job satisfaction, while neuroticism had a negative direct effect on job satisfaction. This is consistent with previous studies reporting that extraversion, agreeable, conscientiousness, and openness were positively correlated to job satisfaction whereas neuroticism was negatively correlated to job satisfaction (House et al., 1996; Jones et al., 2015; Judge et al., 2002; Templer, 2012; Zhai et al., 2013). The constructs of extraversion, agreeable, conscientiousness, and openness are considered as proactive personality. For example, a person who displays extraversion traits is characterised as being energetic, sociable, assertive, and expressive; agreeableness consists of positive affectivities such as sympathy, empathy, compassion, kind-heartedness, and being accommodating; conscientiousness is comprised of characteristics of dependability, orderliness, perseverance, and attentiveness; and openness reflects attributes such as self-sufficiency, curiosity, creativeness, and inventiveness (Barr, 2018). Health professionals with these positive attributes are likely to experience more work engagement to fulfil their career aspirations; more trust when working with colleagues and patients; and less negative emotional reactions such as emotional exhaustion (Yan et al., 2019). These optimistic attributes may collectively and positively contribute to their levels of job satisfaction. In contrast, neuroticism includes negative attributes such as anxiety, worry, fear, irritability, anger, frustration, and nervousness (Barr, 2018). As a result, individuals with neurotic personality traits may be emotionally unstable and may be unable to regulate their emotions (Hlatywayo et al., 2013). Consequently, they may not enjoy work in a healthcare setting where they would need to manage both their own and patient's emotions in a stressful environment.

The above findings regarding the association between personality and job satisfaction suggest a cultural difference, when compared to past research. For example, the positive correlations between agreeableness and job satisfaction were not found in Haynie et al. (2007) or Foulkrod et al. (2010) conducted with healthcare workers in the USA. Existing literature has reported that agreeableness is relatively sensitive to cultural context (Konstabel et al., 2002; McCrae et al., 1998b). McCrae et al. (1998b) reported that Chinese Canadians scored higher on agreeableness than European Canadians. One factor that connects Chinese culture and agreeableness may be collectivism. Generally speaking, Chinese people tend to be more collectivist (Schmitt et al., 2007). Konstabel et al. (2002) reported that cultural groups with high mean scores in collectivism had higher scores in agreeableness compared to their American counterparts. Chinese culture emphasises harmony and interconnectedness (Li, 2013). Therefore, Chinese people tend to be more agreeable, interdependent, and accommodating compared to American people (Eap et al., 2008). Another factor that associates Chinese culture with agreeableness may be the Chinese concept of *face*. In Chinese culture, face represents one's social reputation and fame that have been deliberately accumulated through efforts and achievements (Hwang, 1987). People rely on affirmation from other people to achieve face work. Disagreement hurts people's face (Li, 2013), which is considered as a behaviour that seriously harms the relationship of all parties concerned (Thomas and Liao, 2010). As such, agreeableness may facilitate the maintenance of people's face and social harmony in the workplace. Consequently, Chinese health professionals with higher scores in agreeableness are more likely to contribute to positive organisational culture in a collective cultural context and thus to appreciate jobs in which they work closely with team members.

The results of indirect effects in the mediation analyses add to the literature about how CS and BO transmit the effect of proactive personality to increase job satisfaction. In other words, extraversion, agreeableness, conscientiousness, and openness increase CS—the positive component of ProQO—and decrease BO—the negative component of ProQOL, which results in increased job satisfaction. Potential explanation may arise from the effects of proactive personality traits on CS and BO. It appears that people with the proactive personality traits of extraversion, agreeableness, conscientiousness, and openness may have the ability to cope with problems such as BO positively and effectively. Furthermore, they may seek to establish positive social relationships which may act as resources of support for reducing BO and enhancing CS (Magnano et al., 2015).

Moreover, CS and BO mediated negative effects of neuroticism upon job satisfaction. In contrast to the proactive personality traits, neuroticism as a negative personality trait

decreases CS and increases BO, which results in lower job satisfaction. A possible explanation is that individuals with a neurotic personality are prone to experiencing emotions in negative ways, which may lead to fearfulness, low self-esteem, social anxiety, and helplessness (Bakker et al., 2006). These negative emotions may increase the likelihood of experiencing higher levels of emotional exhaustion such as BO, and a lower level of CS. The higher level of BO and lower level of CS result in lower job satisfaction. Higher levels of neuroticism may also associate with lower resilience (Brewin et al., 2000) and correlate to negative thinking (Tehrani, 2016), which may undermine confidence and abilities to cope with BO.

Furthermore, STS mediated the positive effect of extraversion upon job satisfaction. In other words, extraversion was associated with lower levels of STS, which in turn was associated with greater job satisfaction. Research has found that extraversion is correlated to higher levels of resilience and post-trauma growth (Wilson, 2006), which may reduce the level of STS. Another possible explanation is that extroverted individuals are more likely to express their emotions and expose themselves to others, which may reduce STS in interpersonal interactions (Jia et al., 2015).

There are several limitations in the current study. Firstly, the current study was cross-sectional, where the exposure and the outcome are determined at the same time point for each participant (Pandis, 2014). For this reason, it may be difficult to make causal inference because the results may be different in a different timeframe (Levin, 2006). This limitation warrants future longitudinal research to investigate the mediating effects of ProQOL on the relationship between personality and job satisfaction among Chinese healthcare professionals. The cross-sectional design may also cause selection bias that occurs when the participants' characteristics are systematically different from the eligible participants who were not selected for the study (Pandis, 2014). To overcome this bias, random and large-scale sampling was implemented, which provided a similar probability for each person to be included in the study and thus ensured that the drawn sample represented the study population (Pandis, 2014). Secondly, the reliabilities of BFI in the present study were at the low end of the acceptable threshold of reliability. This may reflect the findings in cross-cultural Big Five personality studies that reliabilities of the Big Five measures are lower in non-English speaking and developing countries compared to those in English speaking and developed countries (Gurven et al., 2013). Such low reliabilities may be a result of methodological problems. Methodological problems include translations not being equivalent, absence of item relevance in the culture being tested, and different styles in responding to the Likert scale (McCrae et al., 1998a; Paunonen and Ashton, 1998; Schmitt et al., 2007). Future research is thus warranted to assess the psychometric properties of the Chinese version of BFI and review on the equivalence of the Chinese

translation to the English version of BFI. Thirdly, the generalisation of the findings of the current study needs to be exerted with caution. The generalisation of the study might be limited to similar population groups.

Despite the limitations, the findings of the present study have certain implications at three levels. At the macro level, the government should consider to increase the investment in the healthcare system to reduce BO in healthcare professionals who face higher workloads than their counterparts in many other countries. For instance, in 2011, China's doctor to patient ratio was 1:550 (Chinese Ministry of Health, 2012), while Australia's was 1:270 (National Rural Health Alliance, 2013). China is the world's second largest economy (The World Bank, 2020a); however, in 2017 its domestic general government health expenditure per capita was ranked the 88<sup>th</sup> in the world with US\$476.69 per capita, compared to the two highest spending countries of Norway's US\$5,571.88 and the USA's US\$5,139.27 (The World Bank, 2020b). It is thus essential that the Chinese government increases the number of medical colleges and public hospitals across the country so as to increase the doctor to patient ratio and with a hope to reduce BO in frontline healthcare workers. The government should also consider increasing investment to better equip community healthcare services. In China, public hospitals are usually the first contact point for patients (Liu et al., 2006), resulting in Chinese hospital healthcare workers' workload being very high. The present study showed that more than 70% of the participants worked more than 40 hours a week, with 5% working more than 60 hours a week. To divert patients with primary care needs from hospital-based care to community-based care, China has promoted community health facilities since 2009 (Wu et al., 2017a). However, a recent survey found that 70% of 1248 participants sampled from the general public still preferred hospital-based services for first-contact care (Wu et al., 2017b). Difficulties that community healthcare services are facing include poorly equipped facilities, and lack of funding to employ skilled and experienced healthcare professionals (Wang et al., 2019). It is thus important that the government increase fiscal support for community healthcare facilities.

At the meso level, hospital management should develop policies and organisation-based intervention programs to address work overload. Burnout is a response to a long-term exposure to the mismatch between the work demands and the resources of healthcare workers (Bianchi et al., 2015). There are two primary approaches to intervention programs addressing BO: to change individual employees and to change the organisation. Programs that focus on changing individuals are more prominent, possibly due to the beliefs that BO is a personal issue and that changing individuals is easier than changing an organisation (Maslach and Goldberg, 1998). Research suggests that interventions focusing on organisation changes to reduce BO result in longer lasting positive effects compared to those placing

emphasis on individual changes (Awa et al., 2010). Organisation-oriented interventions often aim at organisation development, including conducting work process restructuring, enhancing management consulting, re-evaluating the effectiveness and fairness of work performance appraisals, addressing significant organisational issues, and improved communication and social support systems (Halbesleben et al., 2006). In addition to the organisational changes, intervention programs to provide individuals with cognitive behavioural training, psychotherapy, counselling, adaptive skill training, communication skills training, and social support will add value to addressing BO in the organisation (Awa et al., 2010).

At the micro level, apart from improving skills of communication, time management and emotion management, and seeking social support and professional help, individual healthcare professionals could devote efforts to increasing resilience. A resilient healthcare worker is capable of combatting stress through enhanced recovery in response to stressful stimuli (Squiers et al., 2017). Instead of passively enduring stress, a resilient individual can bounce back and thrive in the face of adversity (Li and Miller, 2017), which may support healthcare professionals to cope with work-related stress and traumas that possibly lead to BO and STS.

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