



## Original Article

# Prevalence and factors associated with compassion satisfaction and compassion fatigue among Chinese oncology healthcare professionals: A cross-sectional survey



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## ABSTRACT

**Objective:** This cross-sectional study examined the prevalence and factors associated with compassion satisfaction and fatigue among oncology healthcare professionals (doctors and nurses) in mainland China.

**Methods:** A total of 337 subjects were recruited via convenience sampling from the oncology departments of five general hospitals in Guangzhou, Guangdong, China. They were invited to complete a survey that included demographic characteristics, the Profession Quality of life Scale, the Brief Cope Questionnaire, and the Connor-Davidson Resilience Scale.

**Results:** The findings showed medium levels of compassion satisfaction, burnout, and secondary traumatic stress among oncology healthcare professionals in China, reaching rates of 78.34%, 63.50% and 75.96%, respectively. Multiple regression analyses suggested that active coping, positive reframing, and strength were the significant factors of compassion satisfaction, explaining 48.6% of the total variance ( $P < 0.001$ ). Substance use and self-blame were the significant factors of burnout, explaining 45.1% of the total variance ( $P < 0.001$ ). Venting, denial, substance use, self-blame, and strength were the significant factors of secondary traumatic stress, explaining 37.6% of the total variance ( $P < 0.001$ ).

**Conclusions:** The high prevalence of compassion fatigue warrants the attention of the hospitals' senior management. The effective coping styles identified may be considered when developing strategies to improve the professional quality of life among oncology healthcare professionals.

## Introduction

Cancer, as a chronic health problem, is a global threat affecting many aspects of human life. It ranks as the first or second leading cause of death globally.<sup>1</sup> According to the latest survey in 2020, the number of newly diagnosed cancer cases and related deaths in China has exceeded that of the global average; a persistently increasing trend over the next 20 years is expected.<sup>2,3</sup> Constantly being reminded of impending death, patients who are diagnosed with cancer tend to suffer from physical and psychological distress due to the complexity of cancer, deterioration of their condition, repeated hospitalization and long-term treatment costs.<sup>4</sup> In this case, the nature and consequences of cancer require adequate attention and support from healthcare professionals.

Healthcare professionals working in the oncology department are committed to relieving the distress and suffering of cancer patients and their families and devote themselves to the improvement of patients' survival outcomes.<sup>5</sup> They collaborate with people from many disciplines to cope with oncological challenges. Doctors work to treat the disease and rehabilitate the health of cancer patients,<sup>6</sup> whereas nurses provide care to optimize patients' physical and psychological well-being.<sup>4,7</sup> However, different from other departments, oncology healthcare professionals encounter more work-related stresses. With the continuous increase in the number of patients diagnosed with cancer, oncology healthcare professionals often deal with many difficult clinical problems without receiving systematically professional training and appropriate intervention to support the patients.<sup>8,9</sup> Oncology doctors need to frequently inform these patients and relatives of the disease progress,

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especially the diagnosis of cancer or the deterioration of the disease, subjecting these doctors to a greater likelihood of immense emotional burden, grief, and distress.<sup>10,11</sup> Since oncology nurses stay with patients and families to provide supportive care for a long time, these nurses are surrounded by seriously ill or dying patients on a regular basis and are predisposed to distress.<sup>12</sup> Due to long-term exposure to high-pressure working environments and often as a witness of patients' suffering, this increases the vulnerability of oncology healthcare professionals to depression and anxiety, and further leads to the inability to provide compassionate care.<sup>13</sup> In addition, occupational stresses, such as academic pressure, the overload in occupational responsibilities, and lack of respect from patients,<sup>3,14</sup> can decrease job satisfaction and ultimately affect their professional quality of life.<sup>15</sup>

Professional quality of life is the quality one feels in relation to their work as a helper;<sup>16</sup> it includes compassion fatigue and compassion satisfaction. Compassion fatigue is defined as a state of exhaustion and dysfunction—biologically, physically, and socially—as a result of prolonged exposure to compassion stress and all that it evokes.<sup>17</sup> Compassion fatigue is specific to the healthcare professionals who help people exposed to trauma and pain; these professionals form a traumatic memory as a result of being involved in patients' suffering. Compassion fatigue consists of secondary traumatic stress and burnout.<sup>16</sup> Secondary traumatic stress refers to the negative feeling brought on by the traumatic memories formed by exposure to other people's pain and empathy with other people's traumatic events; the symptoms of secondary traumatic stress are emotional and spiritual stressful states.<sup>18,19</sup> Burnout is a state of gradual exhaustion and indifference to professional responsibility. Compassion satisfaction includes the positive aspects of the work experience of healthcare professionals.<sup>16</sup> Relieve the suffering of cancer patients, provide hospice care, help terminal patients and their families accept death painlessly and peacefully can result in compassion satisfaction.<sup>20</sup>

Oncology healthcare professionals are at a higher risk of compassion fatigue than those in other departments.<sup>21</sup> Doctors reported that they suffer from constant compassion fatigue along with the pessimistic situation of burnout;<sup>22</sup> they claim to have a relatively moderate level of professional quality of life.<sup>23</sup> In China, oncology nurses are at a medium level of compassion fatigue.<sup>24</sup> Doctors and nurses often need to cooperate during work due to the working characteristics of "ward bed responsibility"; thus, the mutual influence of compassion fatigue may exist among them.<sup>25,26</sup> A high level of compassion fatigue can affect the self-care quality of healthcare professionals themselves, thereby reducing the satisfaction of patients and relatives.<sup>27</sup> Moreover, compassion fatigue can directly lead to the resignation of staff.<sup>28</sup> However, the prevalence of professional quality of life, including compassion satisfaction, burnout, and traumatic stress, among healthcare professionals in the oncology department in mainland China is still unclear.

Previous studies have indicated that demographic variables, such as age, work experience, professional achievements, and educational level are influencing factors of compassion fatigue and satisfaction, but the results of several meta-analyses were inconsistent.<sup>29,30</sup> Positive coping styles could promote compassion satisfaction and help the workers resist compassion fatigue.<sup>31</sup> To protect themselves, these professional staff attempt to reduce their involvement, which decreases sympathy and perception of the suffering of others and leads to indifference to humanistic care.<sup>32</sup> However, positive or negative coping style is relative; for example, suppressing sadness or disappointment, which is considered as the positive coping style,<sup>33</sup> may become the aggravating factor of compassion fatigue for oncology healthcare professionals who frequently and directly encounter death.<sup>34</sup> Nonetheless, the subject of current related literature only focuses on nursing staff. Therefore, it is necessary to study the relationship between various coping types such as active coping,

situational denial, and other coping strategies, with compassion satisfaction and fatigue among doctors and nurses to help senior management formulate targeted intervention.<sup>35</sup>

Resilience refers to the ability to recover from adversity; it consists of tenacity, strength and optimism.<sup>36</sup> Tenacity is the ability to face stress directly rather than avoid it; strength reflects the degree of adaptation and acceptance when dealing with the changes brought on by stressful challenges; and optimism reflects confidence in handling the matter.<sup>37,38</sup> Previous studies have investigated the relationship between resilience and compassion satisfaction and fatigue; resilience is the positive factor involved in promoting compassion satisfaction and resisting compassion fatigue.<sup>39</sup> However, these studies did not examine the relationship between tenacity, strength, and optimism with compassion satisfaction, burnout, or secondary traumatic stress. In addition, it remains unclear how these three traits contribute to the three constructs of the professional quality of life of doctors and nurses.

### *Theoretical framework*

This study adopts the Transactional Theory proposed by Lazarus and Folkman as a theoretical framework;<sup>39</sup> this is a stress-coping model based on cognitive evaluation (Figure 1). Individuals first assessed stress levels of threats and then secondarily assessed the potential responses to these threats. Then, the reactions to these threats were determined. The ways of dealing with the potential response depended on the individual's coping styles, which included the problem-focused and the emotion-focused coping styles. A problem-focused coping style is a strategy used to solve stressful events. It plays a dominant role when individuals need to perform constructive behaviors. Emotion-focused coping style is a way to reduce emotional distress and plays a dominant role when stressful events must be endured.

Stress occurs when the levels of these stressors exceed an individual's coping ability and resources. Burnout and secondary traumatic stress (or compassion fatigue) are the perceived pressures. Specifically, burnout arises from a stressful working environment, e.g. presence of workplace violence or promotion stress. Secondary traumatic stress, such as fear or grief, occurs after the emotional involvement; this stress is associated with direct exposure to traumatic situations.<sup>40</sup> Oncology healthcare professionals conduct a cognitive evaluation on these stressors and exert various efforts to cope; such efforts stimulate the individuals to achieve positive or negative coping results. Under certain stressful situations, individuals' emotion-centered coping process is relatively stable,<sup>41</sup> which may be related to the protective role of resilience.<sup>42</sup> Therefore, the relationships among different coping behaviors, resilience, compassion satisfaction, burnout, and secondary traumatic stress under stressful situations need to be determined to further identify the risk and protective factors of compassion fatigue among this population.

This study aimed to (1) investigate the prevalence of compassion satisfaction, burnout, and secondary traumatic stress among healthcare professionals in the oncology department; and (2) to identify the potential predictors of compassion satisfaction, burnout, and secondary traumatic stress under the guidance of Transactional Theory. The following hypotheses were formulated. (1) Oncology healthcare professionals show a moderate to high level of compassion fatigue and compassion satisfaction. (2) Positive coping style and resilience are positively associated with compassion satisfaction and negatively associated with burnout and secondary traumatic stress. Resilience is positively associated with compassion satisfaction and negatively associated with burnout, secondary traumatic stress. (3) Demographic variables, coping style, and resilience predict compassion satisfaction, burnout, and secondary traumatic stress among oncology healthcare professionals.

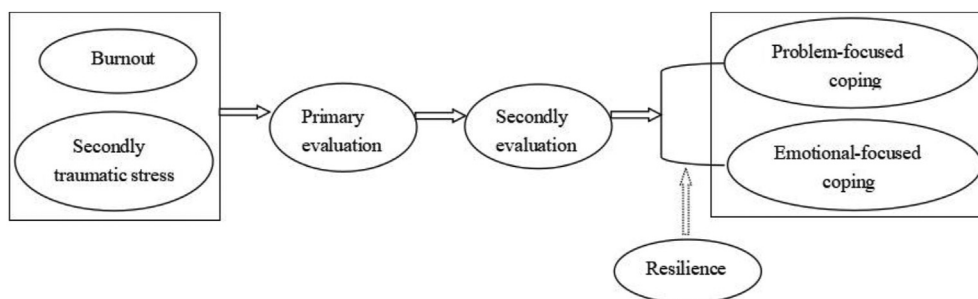


Figure 1. Theoretical framework in this study.

## Methods

### Study design, participants and setting

This was a cross-sectional survey. Convenience sampling was adopted to recruit participants in the oncology departments of five general hospitals in Guangzhou Province in China.<sup>43</sup> Those who met the following inclusion criteria were included: (1) obtained the professional qualification certificate of doctor or nurse, (2) at least 1 year of experience in the oncology department, (3) can understand Chinese. Exclusion criteria included the following: (1) doctors and nurses in rotation for training; and (2) intern doctors and nurses.

The sample size was calculated by referring to the sample requirement in the multiple linear regression analysis, which is at least 10–15 times the number of independent variables.<sup>43,44</sup> In this study, the number of independent variables is 26. In considering an attrition rate of 20%, 327–477 subjects were required.<sup>45</sup>

### Instruments

#### General demographics and work-related characteristics

The general demographic information and work-related characteristics of the participants, including age, gender, marital status, educational level, professional title, oncology department, years of experiences in the oncology department and employment category, were collected at the beginning of the survey.

#### Professional quality of life scale (Pro-QoL)

Pro-QoL was adopted to measure compassion satisfaction and fatigue.<sup>16</sup> The scale consists of three subscales of compassion satisfaction, burnout, and secondary traumatic stress, of which burnout and secondary traumatic stress were used to assess compassion fatigue.<sup>18</sup> It contains 30 items that are rated on the 5-point Likert, from 1 (Never) to 5 (Always). Each subscale with a score of 22 or less is considered low, and a score of 23–41 is considered medium. A score of 42 or above is considered high.<sup>25</sup> The Chinese version of Pro-QoL was used in this study. The items are in traditional Chinese; thus, simplified Chinese was added under each item to facilitate the comprehension of participants. In this study, the Cronbach's  $\alpha$  of the entire scale was 0.716, and the Cronbach's  $\alpha$  values of each subscale were 0.910, 0.811, and 0.798.

#### Brief Cope Style Questionnaire

The 28-item Brief Cope Style Questionnaire is a short version of the Cope Inventory, which was developed based on the transactional theory.<sup>46</sup> Fourteen behavioral strategies for coping with stress were assessed, including active coping, planning, use of instrumental support, use of emotional support, positive reframing, religion, acceptance and humor, venting, behavioral disengagement, self-distraction, self-blame, substance use, and denial. Each strategy consisted of two items, which are scored by a 4-point Likert scale, rating from 0 (Not at all) to 3 (Often). The higher the score, the more likely to adopt a certain coping strategy.

The scale has been validated and used in mainland China with Cronbach's  $\alpha$  coefficients ranging from 0.83 to 0.87.<sup>47</sup> The Cronbach's  $\alpha$  coefficient in this study was 0.854.

#### The Connor-Davidson Resilience Scale (CD-RISC-25)

CD-RISC-25 was used to assess resilience.<sup>48</sup> The Chinese version consists of 25 items with three subscales of tenacity, strength, and optimism. Each item is scored on a 5-point Likert scale, ranging from 1 (Never) to 5 (Always). CD-RISC-25 was reported to have good reliability with the Cronbach's  $\alpha$  of 0.92.<sup>49</sup> In this study, the Cronbach's  $\alpha$  coefficients of the total scale and each subscale were 0.968, 0.947, 0.933, and 0.713, respectively.

### Data collection

The data were collected via an online survey. The online survey portal with the QR code was created by Sojump. The researcher invited the chiefs and head nurses of the departments as research assistants to assess the eligibility of the potential participants, distributed the QR code and asked those eligible to fill out the survey. The participants who were interested scanned the QR code to complete the online survey using Wechat, a popular social application in China. During data collection, about 700 healthcare professionals worked in the selected oncology unit, and about 500 healthcare professionals fulfilled the criteria. Data were collected between April 1, 2021 and June 30, 2021.

### Data analysis

IBM SPSS25.0 was used to analyze the data. Descriptive statistics were used to describe the demographic characteristics, compassion satisfaction, and compassion fatigue. Distribution normality was tested by Shapiro–Wilk test. Continuous variables conforming to the normal distribution were described as mean and standard. Independent Student's *t*-test was used in two independent samples univariate analysis; One-way ANOVA test was used in multiple independent samples univariate analysis. Pearson correlation analysis was used to examine the correlation. All the statistically significant factors in the univariate and correlation analysis were included in the multiple linear regression equation. The statistical significance level was set at  $P < 0.05$  (two-sided).

### Ethical considerations

Ethical approval was obtained from the Ethics committee (Approval No.YE2021-150). All study procedures involving human participants were handled in accordance with the Helsinki Declaration. Online consent was obtained from each participant prior to completing the investigation. Participants were informed all data would be used only for the study, their information would be handled confidentially, only aggregate data would be reported, and they could withdraw at any time.

**Results**

*Participants' characteristics*

A total of 348 participants were included, comprising 99 doctors and 249 nurses. Among these participants, 11 invalid questionnaires were excluded, as one participant had unknown oncology working experience, seven participants had unknown age, and three participants had an unknown professional title. Finally, a total of 337 valid answers were obtained, including 95 doctors and 242 nurses. Of these eligible participants, all of them provided completed answers to the questionnaire. The participants were aged from 21 to 55 ( $33.29 \pm 7.16$ ) with years of experience in the oncology departments from 1 to 30 ( $8.27 \pm 6.60$ ). About half of them had a junior professional title (55.2%), worked in the medical oncology department (46.88%), attained a bachelor's degree (59.05%), were married (64.69%), and the majority of them were female (86.05%). The characteristics of 337 subjects are presented in (Table 1).

*Prevalence of compassion satisfaction and compassion fatigue*

The scores of compassion satisfaction, burnout, and secondary traumatic stress of the participants were  $35.95 \pm 6.75$ ;  $26.12 \pm 5.06$ ;  $26.10 \pm 5.64$ , respectively. Although not statistically significant, nurses reported higher scores on compassion satisfaction ( $36.19 \pm 6.88$  vs.  $35.32 \pm 6.39$ ), but lower scores on burnout ( $25.81 \pm 5.10$  vs.  $26.88 \pm 4.90$ ) and secondary traumatic stress ( $25.82 \pm 5.58$  vs.  $26.82 \pm 5.77$ ) than doctors. In general, 78.34%, 63.50%, 75.96% of the participants fell into a medium level of compassion satisfaction, burnout and secondary traumatic stress (Table 2).

*Univariate analysis of compassion satisfaction and compassion fatigue*

Table 3 shows the results of the univariate analysis of compassion satisfaction and compassion fatigue. One-way ANOVA test showed that

**Table 1**  
Demographic characteristics of the participants (n = 337).

Variables	Category	n	%
Profession	Doctors	95	28.19
	Nurses	242	71.81
Age (years)	≤ 29	120	35.61
	30–39	155	45.99
	40–49	49	14.54
	≥ 50	13	3.86
Gender	Male	47	13.95
	Female	290	86.05
Marital status	Single	115	34.12
	Married	218	64.69
	Divorced	4	1.19
Education level	Diploma degree	40	11.87
	Bachelor's degree	199	59.05
	Master's degree	75	22.26
	Doctorate degree	23	6.82
Professional title	Junior	186	55.19
	Middle	105	31.16
	Subsenior	32	9.50
	Senior	14	4.15
	Oncology department	Medical oncology	158
	Surgical oncology	66	19.58
	Hematological Oncology	89	26.41
	Others	24	7.12
Years of experiences in oncology department	≤ 5	146	43.32
	5.1–10	85	25.22
	10.1–15	61	18.10
	15.1–20	31	9.20
	> 20	14	4.15
Employment category	Labor dispatching	19	5.63
	Labor contract	222	65.88
	Permanent staff	96	28.49

there were statistically significant differences in the compassion satisfaction among healthcare professionals of different ages ( $P = 0.000$ ), different professional titles ( $P = 0.002$ ), and different years of experiences in the oncology department ( $P = 0.004$ ), respectively. However, no statistical significance was found in burnout and secondary traumatic stress between different characteristics of general demographic variables.

*Correlation between compassion satisfaction, compassion fatigue, and coping style, as well as resilience*

Table 4 presents the significant correlations between the compassion satisfaction, burnout, secondary traumatic stress, coping styles, and resilience. For the coping styles, compassion satisfaction was positively correlated with active coping, planning, use of instrumental support, positive reframing, acceptance, and self-distraction. However, compassion satisfaction was negatively correlated with humor, behavioral disengagement, denial, and substance use. Burnout was correlated with all the coping styles except self-distraction, while secondary traumatic stress was correlated with all coping styles except planning and the use of instrumental support. For resilience, all subscales (tenacity, strength, and optimism) were positively correlated with compassion satisfaction ( $r = 0.549$  to  $0.684$ ,  $P < 0.01$ ), but negatively correlated with burnout ( $r = -0.485$  to  $-0.619$ ,  $P < 0.01$ ) and secondary traumatic stress ( $r = -0.189$  to  $-0.283$ ,  $P < 0.01$ ).

*Multiple linear regression analysis of compassion satisfaction and compassion fatigue*

All factors with statistical significance ( $P < 0.05$ ) in univariate analysis (age, professional title, years of experiences in the oncology department) and correlation analysis (coping styles and resilience) were included as candidate variables in the multiple linear regression equation. The results of the multiple linear regression analysis are presented in Table 5. Active coping, positive reframing, and strength were the factors significantly and independently associated with compassion satisfaction and explained 48.6% of the variation ( $P < 0.001$ ). Substance use and self-blame were the factors significantly and independently associated with burnout, explaining 45.1% of the variation ( $P < 0.001$ ). Venting, denial, substance use, self-blame, and strength were the factors significantly and independently associated with secondary traumatic stress, explaining 37.6% of the variation ( $P < 0.001$ ).

**Discussion**

This study examined the prevalence and factors associated with compassion satisfaction, burnout, and secondary traumatic stress among oncology healthcare professionals in mainland China. The results revealed medium levels of compassion satisfaction, burnout, and secondary traumatic stress among healthcare professionals with prevalence rates of 78.34%, 63.50%, and 75.96%, respectively. Our findings showed similar but slightly higher scores and prevalence to previous studies.<sup>31,50</sup> During the investigation period, China was at the normalization stage of coronavirus disease 2019 (COVID-19) prevention and control, with the characteristics of local aggregation epidemic existing, so that healthcare professionals still need to combat the epidemic.<sup>51</sup> Cancer patients need to be hospitalized repeatedly for routine chemotherapy, coupled with their physical weakness, which increases the risk of spreading COVID-19. Unlike emergency medical staff who have directly contacted suspected or confirmed patients on the front line, oncology medical staff exposed to patients who are known to have tested negative for viral nucleic acid are demanded to exert more effort to the self-management in order to protect patients, leading to increased compassion fatigue.<sup>52</sup>

Cancer care requires advanced techniques and effective disease management via multidisciplinary collaboration, thereby enhancing healthcare professionals' satisfaction when providing support for terminally ill patients and thereby resulting in a higher level of compassion

**Table 2**  
Compassionate satisfaction and compassion fatigue of participants ( $n = 337$ ).

		Compassion satisfaction			Compassion fatigue					
		Doctors	Nurses	Total	Burnout			Secondary traumatic stress		
					Doctors	Nurses	Total	Doctors	Nurses	Total
Low	<i>n</i>	1	5	6	24	99	123	15	63	78
	%	1.05	2.07	1.78	25.26	40.91	36.50	15.79	26.03	23.15
Medium	<i>n</i>	79	185	264	71	143	214	79	177	256
	%	83.16	76.44	78.34	77.74	59.09	63.50	83.16	73.14	75.96
High	<i>n</i>	15	52	67	0	0	0	1	2	3
	%	15.79	21.49	19.88	0	0	0	1.05	0.83	0.89
Total	<i>n</i>	95	242	337	95	242	337	95	242	337
	%	100	100	100	100	100	100	100	100	100

satisfaction.<sup>53</sup> However, in the current state of healthcare, staffing shortage in China leads to low healthcare professionals to bed ratio and an increase in workload. supportWith less training in psychological healthcare, coupled with insufficient management support, and increased patient acuity, oncology healthcare professionals may not be able to provide compassionate care effectively.<sup>54</sup> In addition, patients in the oncology department usually experience multiple chronic health problems, and most are in the end-of-life stage, which consistently exposes healthcare professionals to the imminent death of patients, thereby leading to high levels of emotional distress<sup>55</sup> and an increase in compassion fatigue. What is more, during this investigation, the findings explain why compassion fatigue level (burnout and secondary traumatic stress) was not mitigated, despite that this study reported a medium level of compassion satisfaction.<sup>56</sup>

The prevalence of doctors with a medium level of compassion fatigue is higher than that of nurses, which is consistent with Ruiz's study.<sup>57</sup> It has been suggested that nursing professionals are more sympathetic and sensitive to weak patients, and they tend to spend more time with patients than doctors; hence, nurses are more prone to compassion fatigue.<sup>32,50</sup> However, doctors play a pivotal role in treating patients and saving their lives; they bear the pressure of deciding the medical treatment that is appropriate. In addition, the pressures of conducting academic research aggravate burnout, thereby likely increasing the level of compassion fatigue of oncology doctors.<sup>58</sup> In mainland China, few studies have been conducted on compassion satisfaction and fatigue among doctors working in the oncology department, which may be due to the limitation in measurement tools. In this study, the Chinese version of the Professional Life Quality Scale was adopted to evaluate both doctors and nurses. Although the tool is typically used among nurses,<sup>59</sup> this scale shows good internal consistency, and the results of the nurse group in this survey were similar to those in other studies.<sup>60</sup> Thus, the results of this study may provide insights into the status of compassion satisfaction and fatigue of oncology healthcare professionals as a whole and may be used as a reference for the distribution of appropriate training and education for doctors and nurses.

The results of the univariate analysis revealed that those who were with senior professional titles and longer years of oncology working experience had high levels of satisfaction, and those who were with longer years of oncology working experience had low levels of burnout, which was in line with the findings of the previous studies.<sup>60</sup> Elderly healthcare professionals have fully adapted to the current working environment and have developed corresponding adaptive behaviors. Besides, holders of senior professional titles and those with long years of oncology working experience often have stronger intuitive knowledge and professional skills.<sup>61</sup> They can better deal with difficult situations, especially after caring for terminal patients for a long time. They are able to better understand the course of the disease and accept death and are more willing to provide care and support to patients. In addition, obtaining a higher professional title is an important symbol of career achievement; thus, their personal expectations are consistent with their actual working effort. They are likely to feel a higher level of satisfaction

and a lower level of burnout. Nevertheless, these factors did not enter the multivariate regression model, which provided potential implications for further studies. The contribution of demographic characteristics to compassion fatigue needs to be studied in the future.

Although the regression model of compassion satisfaction, burnout, and secondary traumatic stress include different dimensions of independent variables, the results of this study are consistent with the theoretical guidance of the Transactional Theory. Forming the cognitive appraisal of compassion satisfaction and compassion fatigue helps reframe the problem positively, which involves trying to change the angle when handling problems, to find the positive factors from stressful events and use constructive coping measures when focusing on problems, such as helping relieve the suffering of patients and their families, which can also promote compassion satisfaction. Active coping and positive framing are two significant predictors of compassion satisfaction. These two problem-focused coping strategies enable healthcare professionals to develop a positive view of the challenges in the work environment; with these coping approaches, workers tend to have high self-efficacy and to believe that they can handle emotional stress and terminal care problems.<sup>62</sup>

Two facets of coping strategies, namely, substance use (avoidant coping style) and self-blame (emotion-focused coping style), were reported as the risk factors that aggravate burnout. When healthcare professionals deal with the stress of burnout associated with career advancement and workplace violence, they usually report frustration, difficulty in self-care, inadequate communication processes, and anger.<sup>55,63</sup> The negative emotions lead them to blame themselves for the stressful events that have already happened, and self-blame can reduce the initiative to cope with stress.<sup>64</sup> These may result in engaging in inappropriate coping behaviors, such as using alcohol and drugs to numb themselves to prevent or control stress,<sup>65</sup> further increasing the risk of burnout and compassion fatigue. Thus, raising the awareness of senior management about this issue is needed to provide necessary stress management and emotion regulation training among healthcare professionals in the oncology department and to cultivate positive coping styles that relieve burnout and ensure staff retention.<sup>66</sup>

Apart from two variables in the burnout model that were identified as significant predictors of secondary traumatic stress, venting and denial are also aggravating factors of secondary traumatic stress. The secondary traumatic stress of healthcare professionals is caused by the traumatic memories of caring for terminally patients and their families. Consequently, when faced with the death of a patient with whom they have established a long-standing professional friendship, oncology healthcare professionals may experience a deeper emotional response.<sup>67</sup> such as suppressing grief and suffering, which can directly lead to the aggravation of secondary traumatic stress. A previous study also reported that suppressing sadness can cause compassion fatigue.<sup>34</sup> Thus, it is vital to arrange courses to help healthcare professionals in the oncology department recognize compassion fatigue to encourage them to appropriately express the traumatic memories that they have suppressed instead of using alcohol or drugs to vent the pressure.<sup>34</sup>

**Table 3**  
Univariate analysis of compassion satisfaction and compassion fatigue.

Variables	Category	Compassion satisfaction			Compassion fatigue					
		Mean ± SD	t/F	P	Burnout			Secondary traumatic stress		
					Mean ± SD	t/F	P	Mean ± SD	t/F	P
Profession	Doctors	35.32 ± 6.39	-1.075	0.283	26.88 ± 4.90	0.257	0.081	26.82 ± 5.77	1.471	0.142
	Nurses	36.19 ± 6.88			25.81 ± 5.10			25.82 ± 5.58		
Age (years)	≤ 29	35.97 ± 6.60	6.235	0.000*	25.93 ± 5.43	1.385	0.247	25.90 ± 6.06	1.600	0.189
	30–39	35.94 ± 7.23			25.90 ± 4.64			25.88 ± 5.40		
	40–49	36.24 ± 6.18			26.47 ± 5.06			26.61 ± 5.26		
	≥ 50	34.77 ± 4.17			29.15 ± 5.81			28.69 ± 5.69		
Gender	Male	34.87 ± 7.05	-1.177	0.240	27.15 ± 5.25	1.512	0.131	26.62 ± 6.58	0.675	0.500
	Female	36.12 ± 6.70			25.95 ± 5.02			26.02 ± 5.48		
Marital status	Single	34.80 ± 6.41	2.583	0.077	27.03 ± 4.88	3.009	0.051	26.24 ± 5.71	0.827	0.438
	Married	36.52 ± 6.90			25.62 ± 5.11			25.96 ± 5.63		
	Divorced	37.50 ± 4.93			27.00 ± 4.97			29.50 ± 3.87		
Education background	Diploma degree	36.48 ± 6.63	0.911	0.436	25.50 ± 4.80	0.450	0.718	24.85 ± 5.87	1.191	0.313
	Bachelor's degree	36.05 ± 6.89			26.03 ± 5.09			26.13 ± 5.43		
	Master's degree	34.99 ± 6.72			26.51 ± 5.22			26.24 ± 6.29		
	Doctorate degree	37.30 ± 5.75			26.65 ± 4.82			27.57 ± 4.60		
Professional title	Junior	34.80 ± 6.14	4.975	0.002*	26.73 ± 4.78	2.623	0.051	26.06 ± 5.49	0.027	0.994
	Middle	36.95 ± 7.15			25.47 ± 5.57			26.17 ± 5.74		
	Subsenior	37.63 ± 7.58			24.12 ± 4.52			26.22 ± 6.76		
	Senior	39.86 ± 6.78			23.71 ± 4.91			25.79 ± 4.61		
Oncology department	Medical oncology	36.11 ± 6.92	0.604	0.613	25.80 ± 5.34	1.029	0.380	25.62 ± 5.07	0.826	0.480
	Surgical oncology	36.38 ± 7.63			25.83 ± 4.69			26.62 ± 6.87		
	Hematological Oncology	35.16 ± 5.98			25.92 ± 4.76			26.62 ± 5.86		
	Others	36.63 ± 5.82			25.96 ± 5.15			25.92 ± 4.62		
Years of experiences in oncology department	≤ 5	34.63 ± 5.89	3.963	0.004*	26.90 ± 4.69	1.972	0.098	26.38 ± 5.71	0.673	0.611
	5.1–10	35.72 ± 6.77			25.95 ± 5.33			25.79 ± 5.57		
	10.1–15	37.62 ± 7.58			24.95 ± 5.14			25.41 ± 5.31		
	15.1–20	38.55 ± 8.00			25.26 ± 5.60			27.16 ± 6.51		
	> 20	38.00 ± 5.36			25.86 ± 4.77			25.71 ± 4.92		
Employment category	Labor dispatching	37.68 ± 6.45	2.227	0.109	25.42 ± 4.05	0.358	0.699	25.95 ± 5.47	0.317	0.728
	Labor contract	35.41 ± 6.57			26.27 ± 5.30			25.95 ± 5.60		
	Permanent staff	36.85 ± 7.12			25.91 ± 4.67			26.49 ± 5.83		

Resilience, as a protective factor, can promote the individuals' effective adaptation.<sup>67</sup> This study suggested that resilience is correlated with compassion satisfaction and compassion fatigue, consistent with the other studies.<sup>49</sup> However, different from the previous study,<sup>63</sup> strength was determined to be the only factor associated with compassion satisfaction and secondary traumatic stress. Strength reflects the degree of adaptation and acceptance when faced with changes of stress challenges.<sup>68</sup> The strong ability of healthcare professionals to adapt to environmental stressors reduces emotional distress, and thereby, promotes compassion satisfaction. In this study, tenacity and optimism were

not included in the model, and such exclusion may be related to the decreased perceived social support. According to the evidence of a previous investigation, the level of perceived social support among nurses in China is only on the medium level.<sup>69</sup> Moreover, the high incidence of workplace violence in recent years has weakened perceived social support among healthcare professionals.<sup>70</sup> For the hospital administrators, creating a safe working environment and providing institutional support for workers to ensure sufficient social support and caring for their needs are of great significance from improving tenacity and optimism, and thereby, resilience.<sup>59</sup>

**Table 4**  
Correlation between compassion satisfaction, compassion fatigue, and coping style, as well as resilience.

Variables	Compassion satisfaction	Compassion fatigue (Burnout)	Compassion fatigue (Secondary traumatic stress)
	r	r	r
Coping styles			
Active coping	0.518**	-0.464**	-0.154**
Planning	0.354**	-0.376**	0.057
Use of instrumental support	0.283**	-0.114*	0.093
Use of emotional support	0.071	0.175**	0.291**
Positive reframing	0.545**	-0.459**	-0.134*
Religion	0.010	0.222**	0.298**
Acceptance	0.503**	-0.395**	-0.090**
Humor	-0.138*	0.344**	0.380**
Venting	0.012	0.156**	0.305**
Behavioral disengagement	-0.299**	0.535**	0.468**
Denial	-0.194**	0.419**	0.501**
Substance use	-0.234**	0.456**	0.418**
Self-blame	-0.083	0.355**	0.425**
Self-distraction	0.197**	0.021	0.263**
Resilience			
Tenacity	0.633**	-0.561**	-0.228**
Strength	0.684**	-0.619**	-0.283**
Optimism	0.549**	-0.485**	-0.189**

\* means statistical significance level at  $P < 0.05$  (two-sided), \*\* means statistical significance level at  $P < 0.01$  (two-sided).

**Table 5**  
Multiple linear analysis of compassion satisfaction and compassion fatigue.

Variables	B	SB	b	t	P	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	P
Compassion satisfaction						0.511	0.486	20.896	< 0.001
Constant	10.633	2.618	–	4.061	0.000				
Active coping	0.806	0.297	0.155	2.713	0.007				
Positive reframing	0.655	0.321	0.124	2.043	0.042				
Strength	0.327	0.124	0.277	2.635	0.009				
Burnout						0.477	0.451	18.223	< 0.001
Constant	32.670	1.424	–	22.948	0.000				
Substance use	0.473	0.188	0.137	2.513	0.012				
Self-blame	0.542	0.203	0.137	2.668	0.008				
Secondary traumatic stress						0.402	0.376	15.488	< 0.001
Constant	21.276	1.691	–	12.583	0.000				
Venting	0.584	0.240	0.141	2.439	0.015				
Denial	1.172	0.248	0.281	4.720	0.000				
Substance use	0.478	0.223	0.124	2.147	0.033				
Self-blame	0.605	0.241	0.137	2.506	0.013				
Strength	–0.237	0.114	–0.240	–2.072	0.039				

–, not reported.

### Implication

Healthcare professionals of the oncology department are under constant pressure due to the nature of cancer, which is a complicated condition, and the heavy tasks in the oncology department. This study provides insights into the protective and risk factors contributing to compassion satisfaction and compassion fatigue. Firstly, the study compared the levels of compassion satisfaction and fatigue in different occupations in the oncology department (doctors vs. nurses) instead of considering only a single type of staff. Findings will provide healthcare managers the insights that they can use to develop effective interventions for the different occupations, such as cultivating positive coping strategies, promoting resilience, and promoting teamwork. Secondly, identifying the risk and protective factors that cause compassion fatigue of healthcare professionals in the oncology department will help institutions raise awareness on these issues, prepare emergency plans for possible loss of personnel in advance and prepare interventions to reduce the level of burnout and compassion fatigue.<sup>59</sup> These interventions include encouraging healthcare professionals to admit and express grief, which is greatly significant in promoting compassion satisfaction and resisting compassion fatigue. Furthermore, actively adjusting the management system of the oncology department, setting up psychological mutual assistance groups, and developing the mental health promotion guidelines for healthcare professions in the oncology department may be the potential directions for the improvement of professional quality of life among oncology healthcare professionals.

### Limitations

Several limitations of this study should be noted. First, convenience sampling was performed in hospitals in Guangzhou, China, which limited the generalizability of the results. Second, due to the nature of the cross-sectional research, the causality among variables cannot be proven, thereby indicating the need for more longitudinal studies. Further studies are also suggested to verify the relationship among the three constructs of the professional quality of life. Third, an unbalanced ratio of male to female participants in this study sample was reported. Different genders have different experiences of compassion fatigue,<sup>71</sup> and the proportion of male nursing professionals has gradually increased in recent times. The experience of male healthcare professionals needs attention and should be further evaluated. In addition, self-reported measurements were the basis for results, thereby decreasing the reliability of the findings. The results should be interpreted with caution.

### Conclusions

This study examined the prevalence and factors associated with compassion satisfaction and compassion fatigue among oncology healthcare professions in mainland China. Results found they suffered from a medium level of compassion fatigue, which warrants the attention of the hospital's senior management. Various coping styles and resilience were associated with compassion satisfaction and fatigue. Findings may provide insights to develop various effective strategies to improve the professional quality of life among Chinese healthcare professionals in the oncology department.

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### Declaration of competing interest

None declared.

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