

ORIGINAL ARTICLE

The reflective risk assessment model of professional quality of life in Chinese nurses

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Abstract

Aim: To apply the reflective risk assessment model in a Chinese health care setting to investigate the relationships between professional quality of life and mental health risk profiles.

Background: Few studies have connected the quality of work life with contributing and coexisting factors such as depression, anxiety and stress, but none to date in a Chinese health care setting.

Method: A cross-sectional survey of 950 registered Chinese nurses was employed.

Results: 299 of 861 participants (34.7%) were categorized into four of five professional quality of life risk profiles, consistent with the reflective risk assessment model. Significant differences were seen with large-sized effects in the mean scores of stress, anxiety and depression among the participants, with participants of the very distressed profile having significantly higher mean scores in stress, anxiety and depression, followed by the at-risk profile group.

Conclusion: The reflective risk assessment model and professional quality of life five risk profiles are supported by this study.

Implications for Nursing Management: The reflective risk assessment model can be used to detect risk factors for mental health in nurses and for the design of interventions that promote nurses' mental health.

KEYWORDS

anxiety, compassion fatigue, compassion satisfaction, depression, stress

1 | BACKGROUND

The changes in biomedicine, technology and normativity in health care systems require health care organisations to improve clinical governance to ensure the quality of health care practices in a sophisticated environment. Among the aspects of clinical governance, risk management plays a significant role in carrying out comprehensive analyses to assess and address risks (Cagliano et al., 2011). Traditionally, areas of risk identified by the health care sector have focused on factors such as personal health care information, physical

security, data security, and patient safety and quality (Guo, 2015; Simeone, 2015). Little attention has been paid to enhancing quality of care by assessing and managing risk factors relating to professional quality of life among health care workers.

Professional quality of life refers to the quality that an individual feels concerning their work and outcomes (Stamm, 2010). There are three components in professional quality of life: compassion satisfaction, burnout and secondary traumatic stress. Compassion satisfaction is the pleasure derived from one's feeling of being able to do their work well (Sacco et al., 2015). Burnout is

associated with feelings of hopelessness and difficulties in coping with work effectively, due to long-term physical and psychological exhaustion (Xie et al., 2020). Secondary traumatic stress refers to negative feelings driven by fear and work-related trauma (Sacco et al., 2015).

Conceptualizing the relationship among the three components in professional quality of life and the intensity of the components, Stamm (2010) developed five risk profiles of professional quality of life to interpret the aforementioned three factors. The most optimistic category reflects the 'positive reinforcement' profile—individuals with high compassion satisfaction, and moderate to low burnout and secondary traumatic stress. Individuals with this profile carry no significant concerns about being able to accomplish their work effectively as an individual or within the organisation. The second profile is the 'at-risk' profile: individuals with scores high on burnout, and moderate to low compassion satisfaction and secondary traumatic stress scores. People with this profile have feelings of inefficacy in their ability to carry out their roles, which may place themselves and the organisation at risk. The third profile is the 'overwhelmed' profile. Individuals within this profile score high in secondary traumatic stress, and low in both burnout and compassion satisfaction, and experience fear usually caused by a negative experience at work. The fourth profile, 'unique to high-risk', identifies individuals who score high secondary traumatic stress and compassion satisfaction, but low burnout. People in this profile are often highly effective at their work because they are compassionate and satisfied with their ability to perform, but are also extremely fearful because of trauma at work. The last profile identifies 'very distressed' individuals. This group has high secondary traumatic stress, high burnout and low compassion satisfaction. Often individuals with this profile feel overwhelmed and useless in the workplace and can feel frightened at work.

Building on Stamm's professional quality of life risk profiles, Hegney et al. (2014) proposed a reflective risk assessment model, which connects professional quality of life with mental distress indicators of stress, anxiety and depression. The reflective risk assessment model integrates those three mental health constructs into the three professional quality of life constructs (compassion satisfaction, burnout and secondary traumatic stress) to examine the correlations among the constructs within Stamm's (2010) risk profile framework.

Empirical research conducted by Hemsworth et al. (2018) lends support to the reflective risk assessment model. Using combined samples of Canadian and Australia nurses, Hemsworth et al. (2018) demonstrated that compassion satisfaction was negatively correlated with stress, anxiety and depression; and secondary traumatic stress and burnout were positively correlated with stress, anxiety and depression. Hegney et al. (2015) also found that compassion satisfaction was negatively correlated with stress, anxiety and depression, while secondary traumatic stress and burnout were positively correlated with stress, anxiety and depression. The same result was also found in a Chinese sample. Xie et al. (2020) reported that compassion satisfaction was

negatively associated with anxiety, depression and burnout; and secondary traumatic stress was positively correlated with anxiety and depression.

In Hegney et al.'s (2014) Australian study using the reflective risk assessment model with Stamm's (2010) risk profile framework, the following was found: 20.4% of nurses were represented by the positive reinforcement profile with low levels of stress, anxiety and depression; 10.6% of nurses fell into the at-risk profile with medium level of stress, low levels of anxiety and high levels of depression; 7.6% of nurses were in the very distressed profile with high levels of stress, anxiety and depression; and 0% and 1.5% of nurses were in the overwhelmed and typically unique to high-risk situation profiles, respectively. A total of 59.8% of nurses were in none of the five professional quality of life risk profiles. Similarly, Hemsworth et al.'s (2020) study with a combined sample of Australian and Mexican nurses reported that 20.1% of participants were in the positive reinforcement profile with low levels of stress, anxiety and depression; 12.3% participants fell into the at-risk profile with medium levels of stress, anxiety and depression; 7.4% of nurses were in the very distressed profile with high levels of stress, anxiety and depression; and 0% and 1.0% of nurses were in the overwhelmed and typically unique to high-risk situation profiles, respectively. A total of 59.3% of nurses were in none of the five professional quality of life risk profiles. Although the results of the two studies are similar, the levels of mental health constructs in the at-risk profile are different. In the at-risk profile, the nurses in Hegney et al.'s study had low levels of anxiety and high levels of depression, while nurses in Hemsworth et al.'s had medium levels of anxiety and depression. The differences in the anxiety levels appear to indicate that the at-risk nurses in Hegney et al.'s study have lower anxiety compared with their counterparts in Hemsworth et al.'s study. The authors of the current paper found that the higher levels of depression in Hegney et al.'s study are possibly caused by miscoding the mean score of 13 in depression as a high level rather than medium level, as per the cut-off score of the scale used in the study.

Importantly, the reflective risk assessment model provides an innovative framework to examine the relationships between the professional quality of life and mental health constructs, which are the variables of interest in the current study, within the established professional quality of life risk profiles. It demonstrates a trend of risk progression for the six constructs being studied for each risk profile. The reflective risk assessment model also offers implications to nursing management that the employed nurse workforce would benefit from interventions that emphasize psychosocial capacity building to reduce nurses' risk profiles, and thus enhance retention of nurses (Hegney et al., 2014). Although the reflective risk assessment model provides empirical evidence for improved understanding of the mechanisms underlying professional quality of life and associated mental health constructs including the dynamics among these variables, apart from Hemsworth et al.'s (2020) study, there are limited studies to draw on. To the authors' knowledge, there is no research employing the reflective risk assessment model to

professional quality of life risk management in a Chinese nursing management setting.

Existing literature revealed that Chinese nursing working environments differ from their counterparts in other countries, which may enhance their vulnerability towards stress and mental distress (Li & Xie, 2020). Using Australia as a comparative example, China's medical system treats the world's largest national population, and in general hospitals, the nurse-to-patient ratio is on average 1:8 during the day and 1:23 at night (Shen et al., 2020). In Australia, the nurse-to-patient ratios are approximately 1:5 during day shifts and 1:7.4 during night shifts (McHugh et al., 2020). These figures suggest that Chinese nurses face higher workloads than their Australian counterparts do. In contrast to Western countries, where many patients' first contact with the health care system is through a general practitioner (GP), in China patients often regard hospitals as the first contact point for health care (Li & Xie, 2020). As a result, Chinese nurses in hospitals have exceptionally high workloads as they are managing both primary and secondary health care. Workplace violence against nurses in Chinese hospitals also appears to be high. In 2010, there were 17,243 cases involving patients or their family members attacking medical staff in hospitals in China (Zhu & Yuan, 2014). Jiao et al.'s study (2014) found that 7.8% of the nurses in their sample reported physically violent experiences and 71.9% reported non-physically violent experiences in the preceding year.

To provide empirical evidence for the development of strategies to enhance professional quality of life and reduce mental distress in Chinese nurses, this study aims to apply the reflective risk assessment model to investigate the relationships between professional quality of life, the risk profiles of professional quality of life and mental health. Four research questions are proposed:

1. Are higher levels of burnout and secondary traumatic stress correlated with higher levels of stress, anxiety, and depression and lower compassion satisfaction?
2. Are higher levels of compassion satisfaction correlated with lower levels of stress, anxiety and depression?
3. What are the professional quality of life risk profiles in the current sample?
4. What are the relationships between professional quality of life risk profiles and DASS in the current sample of Chinese nurses?

2 | METHODS

2.1 | Research design and participants

The research employed a cross-sectional design. Data were collected between January and December 2017. Inclusion criteria were registered nurses who worked in state-owned hospitals. Registered nurses who worked in administration positions were excluded. A priori estimations of the number of participants needed to have adequate power to detect an effect when conducting one-way ANOVA using G*Power version 3.1.9.4 indicated a sample of 305 (number

of groups = 5, effect size=0.25, power level=0.95 and an alpha level=0.05). To ensure a sufficient sample, 950 registered nurses using simple random sampling were recruited in Foshan city, China. A total of 905 questionnaires were returned, resulting in a 95.2% response rate.

2.2 | Measures

The 30-item Chinese version of Stamm's (2010) Professional Quality of Life Scale (ProQOL) was used to measure burnout, secondary traumatic stress and compassion satisfaction, and to establish five professional quality of life risk profiles. It is a self-report questionnaire with 10 items for each subscale. Responses were recorded using a 5-point Likert scale from 1 (*never*) to 5 (*very often*). Five reverse-scored items were recoded. The raw scores were converted to t-scores for analysis and report (except mean and standard deviation using raw scores) (Stamm, 2010). Higher scores indicate higher levels of burnout, secondary traumatic stress and compassion satisfaction. In the present study, Cronbach's alphas for compassion satisfaction, burnout and secondary traumatic stress were 0.857, 0.721 and 0.817.

The Chinese version of the short Depression Anxiety Stress Scale (DASS) was used to measure stress, anxiety and depression (Moussa et al., 2001). The 21-item DASS is a self-report questionnaire with seven items for each subscale. Participants were asked to rate how each item applied to them using a 4-point Likert scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). To calculate comparable cut-off scores with the full 42-item DASS, each 7-item scale was doubled (Lovibond & Lovibond, 1995). The higher the score, the more severe the stress, anxiety or depression. In the present study, Cronbach's alphas for stress, anxiety and depression were 0.869, 0.868 and 0.872.

Table 1 shows the cut-off scores of compassion satisfaction, burnout, secondary traumatic stress, stress, anxiety and depression.

TABLE 1 The cut-off scores for ProQOL and DASS

ProQOL (t-score)	Compassion satisfaction	Burnout	Secondary traumatic stress
Low	≤44	≤43	≤42
Moderate	45–56	44–55	43–55
High	≥57	≥56	≥56
DASS	Stress	Anxiety	Depression
Normal	0–14	0–7	0–9
Mild	15–18	8–9	10–13
Moderate	19–25	10–14	14–20
Severe	26–33	15–19	21–27
Extremely severe	34+	20+	28+

Note: ProQOL scores: Stamm (2010); DASS scores: Lovibond and Lovibond (1995)

2.3 | Procedure

Ethical approval for the larger study on mental health in Chinese health care workers was obtained from the Human Research Ethics Committee of James Cook University, Australia.

The reference number of the ethical approval is Ref. H5824. An informed consent form was attached to the questionnaire. The questionnaires were distributed through the administration of the government department of health of the city. A questionnaire-collecting box was set up in the mailing room of the participating hospitals. The returned questionnaires were stored in a locked cabinet in the third author's office.

2.4 | Statistical analysis

Data analysis was performed using IBM's SPSS version 23 (IBM, 2015). The questionnaires with more than 10% missing variables were removed, resulting in 882 questionnaires. Mean substitution was used to replace missing values. The removal of 21 multivariate outliers resulted in a valid sample of 861 participants. The Kolmogorov-Smirnov test was employed to assess the normality distribution of data, which suggested that all scales were not normally distributed ($p \leq 0.002$). Following the failure of log and square root transformations to adequately adjust for the normal distribution, an alternative to statistical technique of bootstrapping with 5,000 iterations was utilized in the analysis including the non-normal scales (Field, 2017). The Pearson correlation was employed to investigate the relationships between the variables under investigation. The Kruskal-Wallis tests, the non-parametric method for ANOVA, were conducted to evaluate differences among the ProQOL profiles in DASS constructs.

3 | RESULTS

3.1 | Demographic characteristics of participants

The demographic factors include the following: gender, age, marital status, education, professional title and annual income. Table 2 shows the breakdown of the demographic characteristics of the participants. The sample was significantly skewed towards female respondents with 95.4% female and 4.6% male.

3.2 | Preliminary analysis

Descriptive statistics (M and SD) for compassion satisfaction, burnout, secondary traumatic stress, stress, anxiety and depression are presented in Table 3. Table 3 also presents the estimate of prevalence of compassion satisfaction, burnout, secondary traumatic stress, stress, anxiety and depression among the participants. It shows that 69%, 78.3% and 78.9% of participants had moderate to high levels of compassion satisfaction, burnout and secondary traumatic stress, respectively, and 45.5%, 62.3% and 43.7% of the

TABLE 2 The demographic characteristics of the participants

Demographic factors		N	%
Gender	Male	40	4.6
	Female	821	95.4
	Total	861	100
Age	20–29	386	44.8
	30–39	240	27.9
	40–49	175	20.3
	50–59	39	4.5
	60–69	21	2.4
	Total	861	100
Marriage status	Single	278	32.3
	Married/ defector	561	65.2
	Divorced/separated/ widowed	22	2.5
	Total	861	100
Qualification	Lower than undergraduate	344	40
	Undergraduate	512	59.5
	Postgraduate	5	0.6
	Total	861	100
Professional title	Senior professional post	12	1.4
	Associate senior professional post	77	8.9
	Intermedium professional post	222	25.8
	Junior professional post	550	63.9
	Total	861	100
Annual income	Less than ¥50,000	211	24.5
	¥50,001– ¥100,000	374	43.4
	¥100,001– ¥150,000	150	17.4
	¥150,001– ¥200,000	86	10
	Higher than ¥200,001	40	4.7
	Total	861	100

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

participants had mild to extremely severe symptoms of depression, anxiety and stress, respectively.

3.3 | Relationships between ProQOL and DASS

Relationships between ProQOL and DASS were examined using the Pearson product-moment correlation coefficient (r) as shown in Table 4. The three DASS constructs were positively correlated with large effect sizes. In ProQOL, burnout was negatively associated with compassion satisfaction and positively associated with secondary traumatic stress, with a large effect size in both associations. Compassion satisfaction was not correlated with secondary traumatic stress. Of the relationship between ProQOL and DASS, compassion satisfaction was

TABLE 3 Prevalence and mean scores of ProQOL and DASS

ProQOL	CS			BO			STS			Total (N = 861)
	Female (N = 415)	Male (N = 40)	Total (N = 861)	Female (N = 415)	Male (N = 40)	Total (N = 861)	Female (N = 415)	Male (N = 40)	Total (N = 861)	
Low N (%)	253 (30.8%)	14 (35.0%)	267 (31.0%)	171 (20.8%)	16 (40.0%)	187 (21.7%)	164 (20.0%)	17 (42.5%)	181 (21.1%)	
Moderate N (%)	398 (48.5%)	17 (42.5%)	415 (48.2%)	445 (54.2%)	17 (42.5%)	462 (53.7%)	480 (58.5%)	18 (45.0%)	498 (57.8%)	
High N (%)	170 (20.7%)	9 (22.9%)	179 (20.8%)	205 (25.0%)	7 (17.5%)	212 (24.6%)	177 (21.5%)	5 (12.5%)	182 (21.1%)	
M(SD)	32.89 (4.84)	32.52 (5.13)	32.87 (4.85)	27.44 (5.14)	25.23 (5.01)	27.34 (5.16)	27.35 (5.83)	23.59 (6.20)	27.17 (5.90)	
DASS				Anxiety						
Normal N (%)	441 (53.7%)	28 (70.0%)	469 (54.5%)	304 (37.0%)	21 (52.5%)	325 (37.7%)	457 (55.7%)	28 (70.0%)	485 (56.3%)	
Mild N (%)	123 (15.0%)	6 (15.0%)	129 (15.0%)	86 (10.5%)	4 (10.0%)	90 (10.5%)	118 (14.4%)	3 (7.5%)	121 (14.1%)	
Moderate N (%)	139 (16.9%)	4 (10.0%)	143 (16.6%)	200 (24.4%)	9 (22.5%)	209 (24.3%)	156 (19.0%)	6 (15.0%)	162 (18.8%)	
Severe N (%)	98 (11.9%)	2 (5.0%)	100 (11.6%)	70 (8.5%)	2 (5.0%)	72 (8.4%)	52 (6.3%)	1 (2.5%)	53 (6.2%)	
Extremely severe N (%)	20 (2.5%)	0 (0%)	20 (2.3%)	161 (19.6%)	4 (10.0%)	165 (19.1%)	38 (4.6%)	2 (5.0%)	40 (4.6%)	
M(SD)	14.47 (9.16)	11.4 (7.62)	14.33 (9.12)	11.27 (8.90)	8.1 (8.01)	11.13 (8.88)	9.28 (8.49)	6.89 (7.47)	9.17 (8.45)	
				Depression						

negatively related to stress, anxiety and depression with medium effect sizes. Burnout was positively associated with stress, anxiety and depression in large effect sizes. Secondary traumatic stress was positively correlated with stress and anxiety in large sizes and with depression with a medium size. In other words, higher levels of burnout and secondary traumatic stress were correlated with higher levels of stress, anxiety and depression; higher levels of burnout but not secondary traumatic stress were associated with lower compassion satisfaction. Moreover, higher levels of compassion satisfaction were correlated with lower levels of stress, anxiety and depression.

3.4 | The ProQOL risk profiles in the current sample

As shown in Table 5, 299 of 861 participants (34.7%) were categorized into four ProQOL risk profiles: positive reinforcement from work ($n = 141$); at-risk ($n = 108$); typically unique to high-risk situation profile ($n = 8$); and very distressed ($n = 50$). Zero cases were found in the overwhelmed risk profile. In other words, Stamm's five risk profiles of ProQOL were partially applicable in the current sample.

3.5 | The relationships between ProQOL risk profiles and DASS

The relationships between ProQOL risk profiles and DASS are at the core of the reflective risk assessment model. Table 5 indicates that there were zero cases in the overwhelmed and only eight cases in the typically unique to high-risk situation profiles. These two profiles were therefore excluded in the Kruskal-Wallis tests that were performed to explore differences in stress, anxiety and depression among the remaining three ProQOL risk profiles. There were significant differences with large-sized effect in the mean scores of stress ($\chi^2(2)=112.90$, $p < .001$, Cohen's $d = 1.55$), anxiety ($\chi^2(2)=96.51$, $p < .001$, Cohen's $d = 1.37$) and depression ($\chi^2(2)=135.41$, $p < .001$, Cohen's $d = 1.81$) among the participants ($n = 299$) of the three profiles. Participants of the very distressed profile had significantly higher mean scores in stress, anxiety and depression, followed by the at-risk profile group. The Dunn-Bonferroni post hoc comparisons showed that the mean scores of stress, anxiety and depression of each pair in the ProQOL risk profiles were all significantly different from one another at $p < .001$.

Following Hegney et al. (2014) reflective risk assessment model, Table 6 presents the ProQOL risk profiles and DASS analysis matrix. To correspond to Stamm's risk levels (low, medium and high) used in the ProQOL risk profile, DASS mean scores presented in Table 5 were recoded into low, medium or high. The DASS normal level was recoded as the low-risk level; DASS mild and moderate levels were recoded as medium-risk level; and DASS severe and extremely severe levels were recoded as high-risk level, as shown in Table 6. The advancement from the positive reinforcement at work profile to the at-risk profile showed a decline from high to low in compassion

	1	2	3	4	5	6
1. Stress	1	.834**	.836**	-.248**	.588**	.537**
2. Anxiety		1	.831**	-.234**	.547**	.537**
3. Depression			1	-.327**	.601**	.487**
4. CS				1	-.521**	-.03
5. BO					1	.591**
6. STS						1

TABLE 4 Bootstrapping Pearson's correlations

** $p < .01$ (2-tailed).

TABLE 5 Percentages and frequencies of the ProQOL risk profiles and DASS mean and median scores

ProQOL Profile	%	Frequency	DASS mean (SD) and median (range)		
			Stress	Anxiety	Depression
High CS and moderate to low BO and STS (positive reinforcement from work profile)	16.4	141	9.44 (8.07) 8.00 (0–38)	7.11 (7.06) 4.00 (0–36)	4.20 (5.53) 2.00 (0–28)
High BO and moderate to low CS and STS (at-risk profile)	12.5	108	18.48 (7.86) 18.00 (0–36)	13.74 (7.72) 14.00 (0–32)	13.19 (7.86) 12.00 (0–34)
High STS and low BO and CS (overwhelmed profile)	0	0	– –	– –	– –
High STS and CS and low BO (typically unique to high-risk situation profile)	0.9	8	10.75 (7.92) 11.00 (0–26)	8.25 (7.13) 7.00 (0–18)	3.00 (4.14) 2.00 (0–12)
High STS and BO and low CS (very distressed profile)	5.8	50	24.36 (6.24) 24.00 (10–42)	21.52 (8.92) 22 (2–40)	20.16 (8.10) 20.00 (2–42)

TABLE 6 ProQOL risk profiles and DASS analysis matrix

ProQOL risk profile	ProQOL			DASS		
	CS	BO	STS	Stress	Anxiety	Depression
Positive reinforcement from work profile	H →	L →	L	L →	L →	L →
At-risk profile	L ←	H ←	L →	M →	M →	M →
Very distressed profile	L	H	H ←	H ←	H ←	H ←

L: Low risk; M: Medium risk; H: High risk.

Note: H, high risk; L, low risk; M, medium risk.

satisfaction, and a rise from low to high in burnout. Correspondingly, the advancement saw an increase from low to medium in stress, anxiety and depression. The evolution from the at-risk to very distressed profiles involved a growth from low to high in secondary traumatic stress, and a consistent increase from medium to high in stress, anxiety and depression. Although there were some differences in some risk levels of anxiety and depression in the matrix, the current risk assessment model of ProQOL reflected Hegney's model.

4 | DISCUSSION

The current study aimed to apply the reflective risk assessment model to a sample of Chinese nurses to explore the relationships between the professional quality of life, ProQOL risk profiles and mental health in Chinese nurses. The preliminary analysis showed

that 75% of the Chinese nurses had moderate to high levels of burnout and secondary traumatic stress, while more than 40% displayed mild to extremely severe stress and depression symptoms, and more than 60% showed mild to extremely severe anxiety symptoms. This prevalence is much higher than in Hegney et al.'s (2014) study, in which the stress, anxiety and depression prevalence among Australian nurses were 17.4%, 24.3% and 18.1%, respectively. There are a number of possible contributors to the higher burnout, secondary traumatic stress and mental distress prevalence in Chinese nurses. First, several organisational factors may contribute. As suggested by Cheng et al. (2019), high levels of workload, unfair appraisal criteria in relation to salary level, lack of participation in organisational decision-making process and high frequency of meetings related to administration are possible contributing factors to the high level of burnout and mental distress. Second, the tense relationship between nurses and patients

in China and resulting stresses created by unrealistic patient expectations regarding treatment outcomes (Zhu & Yuan, 2014) are likely to contribute to the high levels of burnout and mental distress. Third, the lack of training on how to deal with secondary traumatic stress may also contribute to the high prevalence of secondary traumatic stress.

Regarding Research Question 1, the current study found that higher levels of burnout and secondary traumatic stress were correlated with higher levels of stress, anxiety and depression; and higher burnout was associated with lower compassion satisfaction. However, secondary traumatic stress was not related to compassion satisfaction. The findings are consistent with Hegney et al.'s (2014) and Hemsworth et al.'s (2020) studies. The findings suggest that the negative affectivities in burnout and secondary traumatic stress are shared by stress, anxiety and depression (Xie et al., 2020). The finding regarding compassion satisfaction indicates that burnout seems to be a risk factor for low compassion satisfaction in the participants.

With respect to Research Question 2, the current study reports that higher levels of compassion satisfaction were associated with lower levels of stress, anxiety, and depression. This finding is also consistent with Hegney et al.'s (2014) and Hemsworth et al.'s (2020) studies. The finding suggests that compassion satisfaction appears to act as a buffer against stress, anxiety and depression. Nurses with high levels of compassion satisfaction may have more internal resources to protect them from psychological distress caused by the exposure to patient traumas and occupational strain (Hegney et al., 2015).

The test of Research Question 3 showed that Stamm's five risk profiles of professional quality of life were partially supported by the current study. About one-third (34.7%) of the participants fell into the four risk profiles in Stamm's (2010) model, which is lower than those in Hegney et al.'s (2014) study (40.2%) and Hemsworth et al.'s (2020) research (40.7%). This finding suggests that although Stamm's risk profiles are applicable to Chinese nurses, the extent of the application may not be as great as in Australian and Mexican samples. Moreover, with zero cases in the overwhelmed profile the current study does not support this risk profile in Stamm's model. This finding is consistent with Hegney et al.'s (2014) and Hemsworth et al.'s (2020) findings. The overwhelmed profile is characterized by a combination of high secondary traumatic stress with low burnout and low compassion satisfaction. In the present study, secondary traumatic stress and burnout were positively associated with a large effect size ($r = 0.59$). Similar correlations were found in Hegney et al.'s (2014) study ($r = 0.55$) and Hemsworth et al.'s (2020) study ($r = 0.57$ and $r = 0.56$ in the Australian and Mexican samples, respectively). Therefore, a combination of high secondary traumatic stress and low burnout is unlikely to exist in these three studies. Furthermore, the majority of the nurses (65.3%) in the current study did not fall into Stamm's risk profiles, similar to Hegney et al.'s (2014) (59.8%) and Hemsworth et al.'s (2020) studies (59.3%). In Stamm's (2010) profiles, medium levels of compassion satisfaction, burnout and secondary traumatic stress were either grouped with low levels of the constructs (e.g. in the positive reinforcement from work and at-risk profiles) or omitted (e.g. in the overwhelmed, typically unique to

high-risk situation and very distressed profiles). Future studies are therefore warranted to explore possible additional risk profiles by adding medium levels of compassion satisfaction, burnout and secondary traumatic stress to five profiles in Stamm's risk model.

The test of Research Question 4 indicated that the nurses in the positive reinforcement from work profile showed high levels of compassion satisfaction and low levels of burnout, secondary traumatic stress, anxiety, stress and depression. The at-risk profile suggested that the nurses demonstrated high levels of burnout, medium levels of anxiety, stress and depression, and low levels of compassion satisfaction and secondary traumatic stress. In the very distressed profile, the nurses experienced low levels of compassion satisfaction and high levels of secondary traumatic stress, anxiety, stress and depression. The levels of stress, anxiety and depression of the at-risk profile in the current study mirror the findings in Hemsworth et al.'s (2020) study with medium levels of stress, anxiety and depression. This finding is different from that of Hegney et al.'s (2014) study. In Hegney et al.'s study, nurses had a medium level of stress, low level of anxiety and high level of depression. The high level of depression in Hegney et al.'s study appears to be a result of miscoding a medium level ($M = 13$) to high level of depression. The higher level of anxiety of the Chinese nurses of the at-risk profile than that in Hegney et al.'s study may be reflective that the overall mean scores of anxiety in Chinese nurses ($M = 11.13$, $M_{\text{male}} = 8.10$, $M_{\text{female}} = 11.27$) are nearly triple those in Australian nurses in Hegney et al.'s study ($M = 4.33$, $M_{\text{male}} = 3.11$, $M_{\text{female}} = 4.63$).

4.1 | Limitations

First, the sample was significantly skewed towards female respondents. The low number of male participants may limit the statistical power in the analysis in relation to gender. However, the gender imbalance does mirror the shortage of male nurses in China. In 2016, only 2.1% of registered nurses in China were male (Xie et al., 2020). Second, the participants were recruited in a metropolitan city with high levels of economic development. The findings may not be applicable in rural areas where economic development is well behind the sampling city. This limitation warrants a national survey.

5 | CONCLUSION

Despite the limitations, the present study adds to the current literature on burnout, secondary traumatic stress, mental distress and the reflective risk assessment model of professional quality of life. Chinese nurses in the current study experienced high levels of burnout, secondary traumatic stress, anxiety, stress and depression. The ProQOL risk profiles of the Chinese nurses partially reflected Stamm's model and were consistent with Hegney et al.'s (2014) and Hemsworth et al.'s (2020) studies. The reflective risk assessment model in the current sample indicates that

the risk reduction from the at-risk and very distressed profiles to the positive reinforcement from work profile involved an increase from low to high levels in compassion satisfaction, and a decrease from higher to lower levels in secondary traumatic stress, anxiety, stress and depression. The findings warrant a direction for future research to employ the reflective risk assessment model to develop intervention programmes to improve nurses' professional quality of life and mental health.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

The reflective risk assessment model can help nursing managers detect risk factors for mental health in nurses. It also offers empirical evidence for nursing managers to develop interventions that promote nurses' mental health. Interventions can aim at changing individuals by offering training in cognitive behavioural changes, resilience, coping and communication. Interventions can also aim to organisational changes, including restructuring work process by reviewing policies, refining nursing management consultation, developing more effective and fairer work performance appraisals, improving nursing social support systems, establishing mental health services for nurses and enhancing transparent communication.

CONFLICTS OF INTEREST

On behalf of all authors, the corresponding author states that there is no conflict of interest.

AUTHORS' CONTRIBUTIONS

WL contributed substantially to the conception of the study, design of the analysis and writing the major portion of the paper. CW contributed substantially to interpreting the results and writing the paper. GX contributed substantially to data collection.

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ETHICAL DECLARATION

An ethical approval was obtained from the Human Research Ethics Committee, James Cook University, Australia. The reference number of the ethical approval is H5824.

DATA AVAILABILITY STATEMENT

The datafile of the current research is available upon the request by qualified researchers. Requests should be directed to A/Prof Wendy Li: wendy.li@jcu.edu.au.

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