

# BMJ Open Burn-out, emotional labour and psychological resilience among gastroenterology nurses during COVID-19: a cross-sectional study

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## ABSTRACT

**Objectives** To investigate the relationship between burn-out, emotional labour and psychological resilience of gastroenterology nurses during the COVID-19 pandemic and explore the factors associated with these specific variables.

**Design** A multicentre cross-sectional study with anonymous self-reporting was conducted from 24 November 2021 to 26 December 2021.

**Setting** The study was conducted in Fujian Province, China.

**Participants** The participants were 345 gastroenterology nurses from 7 tertiary hospitals.

**Primary and secondary outcome measures** Burn-out, emotional labour and psychological resilience were the primary outcome measures. Using a convenience sampling method, the data were collected using Questionnaire Star (a tool for questionnaire surveys) via WeChat. The Chinese version of the Maslach Burnout Inventory, the Chinese version of the Emotional Labour Scale and the Chinese version of the Psychological Resilience Scale were used to evaluate burn-out, emotional labour and psychological resilience, respectively.

**Results** The total scores for burn-out, emotional labour and psychological resilience in gastroenterology nurses were  $53.07 \pm 19.63$ ,  $38.79 \pm 12.22$  and  $69.97 \pm 22.38$ , respectively, with less use of deep acting and more use of surface acting. Pearson correlation analysis showed that burn-out was positively correlated with two dimensions of emotional labour; surface acting and emotional expression, and negatively correlated with deep acting. There was a negative correlation between emotional labour and all three dimensions of psychological resilience.

**Conclusions** Greater adoption of deep acting by nurses can be promoted by improving their psychological resilience during events such as the COVID-19 pandemic, which can help improve emotional labour, thereby reducing burn-out and decreasing turnover rates. Senior management in hospitals must pay attention to nurses' psychological status. Further interventional studies could be conducted in the future to explore relevant measures.

## INTRODUCTION

Following the WHO's declaration that the COVID-19 pandemic was a 'public health emergency of international concern',<sup>1</sup> more

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study provides valuable insights into the current state of burn-out, emotional labour and psychological resilience among gastroenterology nurses during the COVID-19 pandemic.
- ⇒ Participating nurses may not be representative of all populations in all countries.
- ⇒ Such cross-sectional studies can only imply association, not causation.
- ⇒ Nurses were self-selected to participate, exposing the study to selection and response bias.
- ⇒ The difficulty of data collection during the pandemic may have led to possible bias in data interpretation.

than 243 million confirmed cases and over 4.9 million deaths had been reported worldwide, as of 24 October 2021.<sup>2</sup>

Annette Kennedy, president of the International Council of Nurses, highlighted that nurses played an important role in maintaining people's health during the pandemic.<sup>3</sup> However, a shortage of nurses is a global public health issue. Falatah<sup>4</sup> suggested that the pandemic appeared to have significantly increased the mean rate of nurses' turnover intention. By the end of 2020, China's total number of registered nurses (RNs) exceeded 4.7 million, with 3.35 RNs for every 1000 people,<sup>5</sup> which is less than the world national average of 3.816 RNs per 1000 people.<sup>6</sup>

According to Global Cancer Statistics 2020, there are nearly 19.3 million new cancer cases and approximately 10.0 million cancer deaths in 185 countries in 2020. Colorectal cancer (10%) ranks third in new cancer cases and gastric cancer (5.6%) ranks fifth; colorectal cancer (9.4%) ranks second and gastric cancer (7.7%) ranks fourth in the number of cancer deaths.<sup>7</sup> Recent study data suggest an increased burden of colon cancer in China and the USA, it is estimated that colon and gastric cancers in China and colon cancer in the USA are covered in the top five cancer

types to be diagnosed in 2022.<sup>8</sup> Therefore, the workload of gastroenterology nurses is severe and there may be a significant increase in stress co-occurring with the COVID-2019.<sup>9</sup> And the quality of nursing staff is closely related to the overall satisfaction of the hospital.<sup>10</sup> Studies have shown that the mental health of healthcare providers cannot be ignored and there is a need to enhance their mental health.<sup>11</sup>

As psychological resilience affects nurses' willingness to leave their profession,<sup>12</sup> understanding the psychological conditions of nurses is crucial for retention. Regarding China's policy response to the COVID-19 pandemic, nurses in Fujian Province were deployed and involved in epidemic prevention and control in their units as required under the National Health Commission of the People's Republic of China. Controlling the COVID-19 pandemic remains a significant public health challenge in China. Hospital nurses, as the principal healthcare workers involved in nucleic acid testing for COVID-19, are often required to undertake such testing. Hospitals play a critical role in combating the epidemic, and its impact on nursing staff permeates their work. Therefore, we investigated the current situation concerning burn-out, emotional labour and psychological resilience among gastrointestinal nurses during the COVID-19 pandemic. However, the focus in terms of the study population was not on nurses directly involved in caring for patients with COVID-19.

As key healthcare workers in the fight against the pandemic,<sup>13</sup> Chinese nurses take care of patients while undertaking various aspects of prevention and control. They are prone to psychological adjustment imbalances because of multiple challenges and pressures. Additionally, studies have shown that providing healthcare affects mental health significantly<sup>14</sup> and have emphasised the importance of exploring psychological resilience support for healthcare workers with burn-out.<sup>15</sup> The first author of this study has worked in the field of gastroenterology for an extensive period and is very concerned about the psychological condition of gastroenterology nurses. One aim of this study is to prompt future related studies to reduce burn-out, manage emotional labour and improve psychological resilience among gastroenterology nurses.

Job burn-out, also known as 'job fatigue,' was first discussed by the American psychiatrist Herbert Freudenberger<sup>16</sup> in 1974. Maslach and Jackson<sup>17</sup> defined burn-out as a syndrome involving excessive physical and mental exertion and energy depletion caused by an individual's prolonged exposure to stress, also known as burn-out syndrome. An international survey in the USA showed a growing global trend in nurse burn-out,<sup>18</sup> which is consistent with the findings of Aiken *et al.*<sup>19</sup> Numerous countries have high rates of burn-out among nurses, such as Japan<sup>19</sup> (33%–60%), South Africa<sup>20</sup> (34.6%) and Spain<sup>21</sup> (21%). Moreover, the total burn-out detection rate among Chinese nurses has been reported to be 69.21%.<sup>22</sup> Additionally, numerous studies have shown that nurses are at high risk of burn-out.<sup>23</sup> High levels

of emotional exhaustion in response to the COVID-19 outbreak have been associated with increased work intensity, the tension between doctors and patients, and a lack of communication with managers.<sup>24</sup> This situation seriously affects nurses' physical and mental health and reduces the quality of nursing care.<sup>25</sup> Furthermore, Luo *et al.*<sup>26</sup> reported a significant correlation between emotional labour and burn-out.

'Emotional labour,' first proposed in 1979 by the American social psychologist Arlie Hochschild,<sup>27</sup> is a term used about employees who consciously manage their emotions at work and display visible external expressions and body movements to the public.<sup>28</sup> Throughout the interdisciplinary literature, emotional labour has two attributes: (1) autonomous or spontaneous emotional expression,<sup>29 30</sup> also referred to as an autonomic emotional regulation<sup>31</sup> and (2) according to the middle-range theory of emotional labour,<sup>32 33</sup> representation of the self as a working persona including both surface acting (ie, expression of superficially felt emotions, including fake, unfelt emotions or suppression of felt emotions)<sup>29 30</sup> and deep acting (ie, expression of deeply felt emotions, and modification of felt emotions to match displayed emotions).<sup>29 30 34 35</sup> Surface acting is analogous to a nurse's smile while working in a hospice, in which the nurse seems to care about the patient and tries to match their emotions to the patient's emotions.<sup>36</sup> In contrast, deep acting implies that nurses connect with patients and project themselves therapeutically.<sup>36</sup> As their work is emotionally intensive, nurses continually confront and manage the negative emotions of patients and their families.<sup>37</sup> Diefendorff *et al.*<sup>38</sup> found that nurses were subjected to a higher emotional load. Similar results have been reported in the Chinese context. Numerous studies have shown moderate to high levels of emotional labour in nurses who work in the emergency<sup>39</sup> and cardiology departments.<sup>40</sup> Frequent and excessive use of emotional labour intensifies nurses' fatigue and burn-out, which increases their propensity to leave their profession.<sup>41</sup> Therefore, it is essential to explore how emotional labour can be properly managed to reduce burn-out.

Psychological resilience, also known as 'mental toughness' and 'bounce-back ability', is a negative predictor of burn-out in the USA.<sup>42</sup> It is the ability to move forward positively from a negative, traumatic or stressful experience.<sup>43</sup> In a study supported by the American Association of Critical-Care Nurses, Mealer showed that 22% of intensive care unit (ICU) nurses with high levels of psychological resilience<sup>44</sup> tended to exhibit optimism, humour, flexibility and high ethical standards.<sup>45</sup> Individuals with higher psychological resilience are better able to deal with stressful situations and, thus, maintain good mental health.<sup>46</sup> Along with the rapid development of global healthcare, building the psychological resilience of caregivers has been listed as one of the top ten international 'standard of care movements'.<sup>47</sup>

Although previous studies have explored the relationship between burn-out and emotional labour and between

burn-out and psychological resilience,<sup>26 42</sup> the association between these factors has not been adequately discussed in the context of the COVID-19 pandemic concerning gastroenterology nurses. Therefore, this study investigated the current status of burn-out, emotional labour and psychological resilience among gastroenterology nurses during the COVID-19 pandemic, to explore relevant associations among these factors in relation to specific variables, and to provide evidence-based research to help reduce nurses' burn-out, increase their job satisfaction, and promote their psychological health during the COVID-19 pandemic.

## METHODS

### Patients and public involvement

The study did not involve patients. All data for this study were obtained from nurses. Neither the study participants nor members of the public participated in the design, implementation, reporting or dissemination plans of our research.

### Study design

This study used a cross-sectional correlational design.

### Research objectives

This study aimed to investigate the situation of burn-out, emotional labour and psychological resilience among nurses in gastroenterology departments in hospitals in China during the COVID-19 pandemic and to explore their related factors and the associations among these variables. The results are intended to help provide a reference point for hospital administrators to implement interventions.

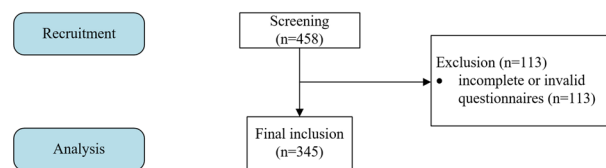
### Setting and sample

This study used a convenience sampling method to select gastroenterology nurses working in Fujian Province, China, from 24 November 2021 to 26 December 2021.

Inclusion criteria were as follows: (1) those who were registered and had a Chinese Nurse Practitioner Certificate; (2) those who had worked in gastroenterology for  $\geq 1$  year and (3) those who provided informed consent to participate in this study voluntarily.

Exclusion criteria were as follows: (1) those who were on leave; (2) those undergoing training or (3) those unable to participate in this study for special reasons (eg, being hospitalised and having their status changed from nurse to patient; uninterested in participating; having already participated in a similar study and not wanting to participate again; being too busy with work and thus did not have time to participate).

The sample size was calculated with reference to the sample requirement for multiple linear regression analysis,<sup>48</sup> which is at least 10 times the number of independent variables. In this study, the number of independent variables was 14. Considering the likelihood of 10%–20% invalid questionnaires, the final sample content was



**Figure 1** CONSORT diagram regarding the sampling process. CONSORT, Consolidated Standards of Reporting Trials.

determined to be 154–168 cases. A total of 458 questionnaires were collected; 345 were valid (75.3% valid return rate); 113 responses were either incomplete or invalid and were excluded, as detailed in figure 1.

### Variables and instruments

#### General demographics and work-related characteristics

General demographic information and work-related characteristics were collected from 345 participants at the beginning of the survey. The information included: sex, age, marital status, number of children, academic qualifications, employment category, working years, professional title, department, directly supervised nursing interns, specialty nurses, number of days per month working at night, number of times per month responsible for epidemic prevention and control posts, and monthly income (RMB).

#### Chinese version of the Maslach Burnout Inventory

The Maslach Burnout Inventory (MBI) is the most extensively used scale for burn-out assessment.<sup>17</sup> The Chinese version of the inventory, translated and revised by Dr Mei-Chi Pang in Hong Kong, was used in this study. The 22-item Chinese version of the MBI includes the three dimensions of emotional exhaustion, depersonalisation and personal accomplishment. Regarding its 7-point Likert scale measurement, higher scores on the emotional exhaustion and depersonalisation dimensions and lower scores on the personal accomplishment dimension indicate higher burn-out. The Cronbach's alpha coefficient was 0.6260,<sup>49</sup> with acceptable reliability.

#### Chinese version of the Emotional Labour Scale

Grandey<sup>50</sup> developed the Emotional Labour Scale based on emotion regulation theory. This study uses the Chinese version of this Emotional Labour Scale translated and revised by Luo *et al.*<sup>26</sup> The 14-item Chinese version of the Emotional Labour Scale includes the three dimensions of surface acting, deep acting and emotional expression. On its 6-point Likert scale, scores range from 1, indicating strong disagreement, to 6, indicating strong agreement, with higher total scores indicating higher levels of emotional labour. The Cronbach's alpha coefficients for the total scale and the three dimensions were 0.811, 0.711, 0.826 and 0.872,<sup>26</sup> respectively, and the scale has good reliability and validity. This scale has been widely used in studies on nurses.

### Chinese Psychological Resilience Scale

Connor and Davidson<sup>51</sup> jointly developed the Connor-Davidson Resilience Scale. This study employed the Chinese version of the scale, translated by Yu *et al.*<sup>52</sup> With a total of 25 items, the Chinese Psychological Resilience Scale comprises three dimensions: resilience, self-improvement and optimism. The responses are rated on a 5-point Likert scale, with scores ranging from 1 (never) to 5 (almost always). Higher scores indicate better psychological resilience. The Cronbach's alpha coefficient of the total scale was 0.91,<sup>52</sup> showing good reliability and validity.

### Data collection

The data were collected through an online survey. The researcher, who was the nursing manager of the gastroenterology department in a tertiary care hospital, used Questionnaire Star (a tool for questionnaire surveys) and sent the URL to the survey respondents via WeChat (a popular social application in China). After describing the study's aims and obtaining informed consent, a link to the survey was posted on the nurses' workgroups via WeChat, and the nurses then completed it. After the questionnaire was collected, it was entered and checked by two researchers using Epidata V.3.1 software to ensure the validity and completeness of the questionnaire.

### Statistical analysis methods

Statistical software (SPSS V.24.0) was used for data analysis. Indicators that conform to a normal distribution and those that do not were expressed as mean±SD ( $\bar{x}\pm s$ ) and median (Q1, Q3), respectively. Q1 represents the 25th percentile, and Q3 represents the 75th percentile. Count data were statistically described using frequency and composition ratios. The Shapiro-Wilk method was used for normality testing. T-tests and analysis of variance (ANOVA) were used for measures that met the normal distribution. Fisher's least significant difference method was used for two-way comparison if the ANOVA results showed statistically significant differences. The Mann-Whitney U rank-sum test and the Kruskal-Wallis H test were used for measures that did not meet the normal distribution. The relationship between the two measures' indicators was analysed using Pearson correlation analysis. The effects of multiple measures on nurses' burn-out, emotional labour and psychological resilience scores were analysed using multiple linear regression (stepwise method, inclusion: 0.05, exclusion: 0.1), and the differences were regarded as statistically significant at  $p<0.05$ .

## RESULTS

### General information

#### Basic information about the survey population

Table 1 shows the basic characteristics of the 345 respondents investigated in this study. In total, 341 (98.8%) nurses were women, 166 (48.1%) were under 30 years, 209 (60.6%) were married, 148 (42.9%) had no children, 127 (36.8%) had one child, 172 (49.9%) had a college

education, 169 (49.0%) had bachelor's degrees or higher, 177 (51.3%) were permanent staff, 168 (48.7%) were in the labour contract category, 179 (51.9%) did not directly supervise nursing interns, 319 (92.5) were not specialty nurses and 213 (61.7) earned more than RMB6000 per month.

### Burn-out score results for the nurses

The total burn-out score of nurses was  $53.07\pm 19.63$  with a mean entry score of  $2.41\pm 0.89$ , with a score of  $14.37\pm 13.49$  on the dimension of emotional exhaustion, 1.00 (0.00, 5.00) on the dimension of depersonalisation, and  $35.18\pm 13.40$  on the dimension of personal fulfilment as detailed in table 2. This result indicates that nurses' accomplishments were high, while the levels of emotional exhaustion and depersonalisation were low.

### Emotional labour score results for the nurses

The total score of the emotional labour of nurses was  $38.79\pm 12.22$ , the mean score of entries was  $2.77\pm 0.87$  and the mean scores of entries in the three dimensions from highest to lowest, were emotional expression ( $3.00\pm 1.34$ ), surface acting ( $2.82\pm 1.21$ ) and deep acting ( $2.36\pm 1.37$ ), as shown in table 2. This result indicates that deep acting was less used in nurses' work, while emotional expression and superficial play were more applied.

### Psychological resilience score results for the nurses

The total psychological resilience score of the nurses was  $69.97\pm 22.38$  and the mean score of the entries was  $2.80\pm 0.90$ , including the score of the toughness dimension ( $37.47\pm 11.89$ ), the score of the self-improvement dimension ( $21.29\pm 7.48$ ) and the score of the optimism dimension ( $11.21\pm 3.98$ ). These are shown in table 2.

### Effects of different demographic characteristics on burn-out, emotional labour and psychological resilience of nurses

#### The effect of different demographic characteristics on nurses' burn-out

Demographic characteristics such as whether they directly supervised nursing interns and the number of days per month working at night affected nurses' burn-out, and the differences were statistically significant. Nurses who directly supervised nursing interns had higher levels of burn-out, as detailed in table 1.

#### Effects of different demographic characteristics on nurses' emotional labour

Demographic characteristics such as marital status, number of children, employment category and professional title affected nurses' emotional labour, and the differences were statistically significant. A two-by-two comparison showed that, in terms of marital status, widowed=unmarried=married<divorced, indicating that the emotional labour of divorced nurses was higher than that of nurses with other marital status. In terms of the number of children, having two children<no children=having one child. In terms of employment category, permanent staff<category labour contract. In terms of

**Table 1** Demographic characteristics of the participants

Variable	n (%)	Burn-out		Emotional labour		Psychological resilience				
		Mean±SD	t'/F	P value	Mean±SD	t'/F	P value	Mean±SD	t'/F	P value
<b>Age (years)</b>										
<30	166 (48.1)	52.81±21.06	1.21 c	0.305	38.54±12.54	0.74 c	0.528	69.48±23.07	0.22 c	0.883
30–39	136 (39.4)	54.45±18.70			39.40±11.84			70.51±20.90		
40–49	40 (11.5)	50.73±16.22			38.50±12.20			69.55±25.19		
≥50	3 (0.9)	35.67±14.01			29.33±12.90			79.00±13.53		
<b>Marital status</b>										
Married	209 (60.5)	52.22±21.37	0.66 c	0.579	39.49±12.74	3.37 c	0.019*	69.05±23.21	0.12 c	0.951
Unmarried	126 (36.5)	53.27±18.43			37.88±11.73			70.53±22.01		
Divorced	8 (2.3)	62.00±22.69			51.25±11.06			69.88±23.85		
Bereaved spouse	2 (0.6)	49.50±20.51			40.00±9.90			70.50±6.36		
<b>No of children</b>										
None	148 (42.8)	52.23±21.11	0.48 c	0.618	39.41±12.49	3.99 c	0.019*	68.60±23.35	0.87 c	0.42
One	127 (36.8)	54.43±19.29			40.06±11.83			69.97±22.19		
Two	70 (20.3)	52.37±16.92			35.19±11.78			72.89±20.57		
<b>Academic qualifications</b>										
Secondary school	4 (1.2)	42.75±17.29	0.91 c	0.437	37.50±4.80	0.26 c	0.856	55.50±37.43	1.99 c	0.116
College	172 (49.8)	52.40±21.28			38.66±12.40			68.19±24.60		
Bachelor's degree or higher	169 (49.0)	54.11±17.83			38.90±12.20			71.97±19.20		
<b>Employment category</b>										
Permanent staff	177 (51.3)	51.98±17.08	-1.05 a	0.294	37.09±12.52	-2.68 b	0.008†	72.60±22.68	2.26 a	0.025*
Category labour contract	168 (48.7)	54.21±21.98			40.58±11.65			67.20±21.77		
<b>Working years</b>										
<2	62 (18.0)	50.35±22.28	0.95 c	0.452	39.29±11.85	0.42 c	0.834	67.47±22.58	0.49 c	0.784
2–5	56 (16.2)	54.41±19.93			38.04±13.65			70.38±20.98		
6–10	79 (22.9)	52.57±21.29			38.91±12.45			71.47±23.89		
11–15	70 (20.3)	54.59±16.83			37.40±11.61			72.30±20.18		
16–20	31 (9.0)	57.97±16.25			40.42±12.60			67.97±23.11		
>20	47 (13.6)	50.38±18.49			39.83±12.01			68.15±24.25		
<b>Professional title</b>										
Junior	236 (68.4)	53.30±20.53	0.192 c	0.825	38.39±12.46	3.460 c	0.033*	69.86±22.35	1.349 c	0.261
Middle	104 (30.1)	52.79±17.44			40.30±12.27			69.44±22.67		
Subsenior and senior	5 (1.4)	48.00±22.23			26.60±13.76			86.20±11.99		
<b>Directly supervising nursing interns</b>										
No	179 (51.9)	50.68±20.30	-2.36 a	0.019*	38.50±12.29	-0.46 a	0.649	69.69±22.18	-0.25 a	0.805
Yes	166 (48.1)	55.64±18.60			39.10±12.16			70.28±22.65		

Continued

**Table 1** Continued

Variable	n (%)	Burn-out			Emotional labour			Psychological resilience		
		Mean±SD	t'/t'/F	P value	Mean±SD	t'/t'/F	P value	Mean±SD	t'/t'/F	P value
Speciality nurses										
Yes	26 (7.5)	52.91±19.76	-0.53 a	0.595	38.50±12.36	-1.58 a	0.115	70.01±22.57	0.09 a	0.429
No	319 (92.5)	55.04±18.08			42.42±9.73			69.58±20.21		
No of days per month working at night										
0	67 (19.4)	47.96±20.42	3.34 c	0.020*	38.01±11.62	0.31 c	0.816	72.18±20.31	0.77 c	0.514
1-4	113 (32.8)	51.44±19.53			38.30±12.51			69.64±22.85		
5-9	133 (38.6)	56.53±19.63			39.37±12.34			68.27±23.66		
≥10	32 (9.3)	55.09±15.71			39.75±12.25			73.63±19.26		
Monthly income (RMB)										
<4000	36 (10.4)	47.03±26.51	2.68 c	0.07	39.36±11.09	0.47 c	0.628	58.86±26.17	5.63 c	0.004†
4000-5999	96 (27.8)	55.80±17.08			39.68±12.72			69.33±22.60		
≥6000	213 (61.7)	52.85±19.20			38.30±12.20			72.14±21.09		

Two independent samples t-test; b: t'-test; c: analysis of variance  
\*p<0.05  
†p<0.01

professional title, junior nurse=middle nurse>subsenior and senior nurse, as detailed in [table 1](#).

### The effect of different demographic characteristics on nurses' psychological resilience

Employment category and monthly income affected nurses' psychological resilience, and the difference was statistically significant. A two-by-two comparison showed that, in terms of forms of employment, category labour contract <permanent staff; in terms of monthly income, less than RMB4000<RMB4000-RMB5999=greater than or equal to RMB6000, as detailed in [table 1](#).

### The relationship between emotional labour, psychological resilience and burn-out in nurses

#### The relationship between burn-out and emotional labour in nurses

The results of the Pearson correlation analysis showed that the nurses' burn-out was positively correlated with their total emotional labour scores ( $r=0.386$ ,  $p<0.001$ ) and that their burn-out was positively correlated with two dimensions of emotional labour, namely, surface acting ( $r=0.450$ ,  $p<0.001$ ), and emotional expression ( $r=0.403$ ,  $p<0.001$ ) and negatively correlated with deep acting ( $r=0.303$ ,  $p<0.001$ ).

#### The relationship between emotional labour and psychological resilience in nurses

The results of the Pearson correlation analysis showed that the nurses' emotional labour was negatively correlated with their total psychological resilience scores ( $r=-0.330$ ,  $p<0.001$ ) and that their emotional labour was negatively correlated with toughness ( $r=-0.323$ ,  $p<0.001$ ), self-improvement ( $r=-0.297$ ,  $p<0.001$ ) and optimism ( $r=-0.332$ ,  $p<0.001$ ).

### Multiple linear regression analysis of predictors of burn-out, emotional labour and psychological resilience in nurses

#### Multiple linear regression analysis of predictors of burn-out among the nurses

The number of days per month working at night and whether they directly supervised nursing interns were predictors of burn-out. The results of the multiple linear regression analysis showed that there was a positive relationship between both these factors and burn-out, as detailed in [table 3](#).

#### Multiple linear regression analysis of predictors of the nurses' emotional labour

The nurses' employment category and marital status were predictors of emotional labour. The results of the multiple linear regression analysis showed that there was a positive relationship between both these factors and burn-out, as detailed in [table 3](#).

#### Multiple linear regression analysis of predictors of psychological resilience of the nurses

The results of the multiple linear regression analysis showed that the monthly income of the nurses was a

**Table 2** MBI-CH, ELS-CH and PRS-CH scores

Questionnaire	Projects	Entry	Score range	Total score	Entry parity score
<b>Burn-out</b>					
	Emotional exhaustion	9	0–54	14.37±13.49	1.60±1.50
	Depersonalisation	5	0–30	1.00 (0.00, 5.00)	0.20 (0.00,1.00)
	Personal fulfilment	8	0–48	35.18±13.40	4.40±1.68
	Total burn-out score	22	0–110	53.07±19.63	2.41±0.89
<b>Emotional labour</b>					
	Surface acting	7	7–42	19.71±8.45	2.82±1.21
	Emotional expression	4	4–24	12.01±5.35	3.00±1.34
	Deep acting	3	3–18	7.07±4.12	2.36±1.37
	Total Emotional Labour Score	14	14–84	38.79±12.22	2.77±0.87
<b>Psychological resilience</b>					
	Toughness	13	0–52	37.47±11.89	2.88±0.91
	Self-improvement	8	0–32	21.29±7.48	2.66±0.94
	Optimism	4	0–16	11.21±3.98	2.80±0.99
	Total Psychological Resilience Score	25	0–100	69.97±22.38	2.80±0.90

ELS-CH, Chinese version of the Emotional Labour Scale; MBI-CH, Chinese version of the Maslach Burnout Inventory; PRS-CH, Chinese Psychological Resilience Scale.

predictor of psychological resilience, with a positive effect, as detailed in [table 3](#).

## DISCUSSION

The objectives of this study were to survey the current status of burn-out, emotional labour and psychological resilience among gastroenterology nurses during the COVID-19 pandemic, to explore the factors associated with them.

According to the China Health Statistics Yearbook 2020, RNs with a bachelor's degree or higher accounted for 23.8% of nurses, graduate students accounted for only 0.2% and nurses with secondary school education accounted for 26.8%. However, the sites where the data were collected for this study were all tertiary class A hospitals, which recruit nurses with a higher educational threshold, which explains why the percentage of nurses with bachelor's degrees or higher was 49.0% in this study

**Table 3** Results of multiple linear regression in terms of MBI-CH, ELS-CH and PRS-CH scores

Variables	B	SE	b	t	P value	R2	Adjusted R2	F	P value
<b>Burn-out</b>						0.038	0.032	6.753	0.001
Constant	43.106	3.068	–	14.050	<0.001				
No of days per month working at night	3.236	1.157	0.149	2.798	0.005				
Directly supervising nursing interns	4.715	2.082	0.120	2.265	0.024				
<b>Emotional labour</b>						0.044	0.033	3.940	0.004
Constant	36.703	0.971	–	37.811	<0.001				
Employment category	3.196	1.362	0.131	2.346	0.020				
Married	ref								
Unmarried	0.608	1.421	0.024	0.428	0.669				
Divorced	12.550	4.342	0.155	2.890	0.004				
Bereaved spouse	3.297	8.550	0.021	0.386	0.700				
<b>Psychological resilience</b>						0.027	0.024	9.607	0.002
Constant	56.286	4.574	–	12.307	<0.001				
Monthly income	5.447	1.757	0.165	3.100	0.002				

B, unstandardised coefficients; b, standardised coefficients; ELS-CH, Chinese version of the Emotional Labour Scale; MBI-CH, Chinese version of the Maslach Burnout Inventory; PRS-CH, Chinese Psychological Resilience Scale.

compared with what was generally the case in 2020. It should also be noted that most of the included nurses with high seniority did not have a bachelor's degree when they joined the profession. However, in recent years, China has increasingly emphasised the importance of the nursing workforce in terms of policy and encouraged in-service nursing staff to upgrade their education. They also promoted nursing staff to improve their research ability and consequently their ability to care for patients. In response, hospitals have gradually increased their recruitment of bachelor's degree graduates; however, the finding that half of the nurses still did not have a bachelor's degree indicates that this commitment to fostering higher levels of education among nurses is an ongoing process.

The findings revealed that the total burn-out score of nurses was higher than that of Tian *et al.*<sup>22</sup> which may be explained by that study conducted in 2014, that is, the pre-COVID-19 period. As nurses working in the fight against the pandemic have worked more than usual during this time, this might have increased their burn-out levels. Many studies have reported varying levels of burn-out among different groups of nurses. Liang *et al.*<sup>53</sup> showed that the total burn-out score of ICU nurses was higher than that found in this study, which may be related to factors such as the more severe conditions of ICU patients, more frequent night shifts for nurses, heavier workloads, greater labour intensity and a shortage of human resources. A study by Li<sup>54</sup> showed that nurses in intravenous drug administration centres had higher scores on the dimension of emotional exhaustion and lower scores on the dimension of personal fulfilment than in this study, which may be related to the fact that nurses in intravenous drug administration centres are at a higher risk of occupational injury,<sup>54</sup> the working environment is more confined, and nurses have less direct contact with patients and family members.

Regarding emotional labour, the total score found for the nurses was lower than that reported by Wu *et al.*<sup>55</sup> This may be related to the fact that Wu *et al.* surveyed 11 337 nurses from 92 hospitals, most of whom were from hospital emergency and surgery departments, which have a heavier workload and more intense work compared with gastroenterology. This may have increased the level of emotional labour of nurses to some extent. This study suggests that the nurses tended to adopt more superficial play at work; they often engaged in emotional camouflage and only displayed pleasing emotions to patients. To a certain extent, this indicates a poor professional identity among these nurses.<sup>26</sup>

In this study, the psychological resilience scores were higher than those of Afshari *et al.*<sup>56</sup> The reason for this could be the difference in the time of the study surveys being conducted. When the current study was initiated, understanding of the new coronavirus was more significant, as was knowledge among the population concerning the preventive effects of vaccination and how to implement and run vaccination programmes smoothly. Nurses

have improved their prevention, control management and response skills, resulting in a relatively higher level of psychological resilience. Therefore, nurses have been able to deal more positively with stress, recover quickly and adapt positively to stress factors.

This study showed that nurses who directly supervised nursing interns had higher levels of burn-out, which may be related to the increased teaching workload and the emotional drain. The higher level of burn-out among nurses with a more frequent number of days per month working at night may be related to the increased frequency of changes in work and rest schedules, which would have increased the physiological and psychological burden placed on them. This study showed higher levels of emotional labour among divorced nurses, which accords with the findings of Zhu *et al.*<sup>57</sup> This may be linked to the fact that divorce increases the emotional burden on nurses, alongside work pressure, which renders them more prone to anxiety, sadness and other negative emotions. The lower level of emotional labour and the higher level of psychological resilience found among the nurses on the permanent staff may be related to the fact that nurses on staff are more stable and have a lower turnover rate. The higher level of emotional labour among junior and middle nurses than among the sub-senior and senior nurses may be related to the difference in years of experience and heavier emotional load. The monthly income level indicates the value hospitals place on their nurses for their hard work and reflects the level of support given to the nursing department. This level of support has a significant effect on nurses' psychological resilience; the greater the level of support, the higher the overall level of nurses' psychological resilience.<sup>58</sup>

This study showed that nurse burn-out was negatively correlated with the deep acting dimension of emotional labour and was positively correlated with the other two dimensions, which accords with a previous study.<sup>26</sup> With developing awareness among increasing numbers of individuals in medicine, patients are paying more attention to their medical experience, and patient satisfaction has become an important criterion for measuring the level of medical care, which requires nurses to have advanced levels of competence in handling the nurse-patient relationship. As shown in Brotheridge and Lee,<sup>59</sup> the behaviour of showing emotions that are inconsistent with one's actual inner experience weakens one's sense of self-worth, and this process requires more psychological resources for nurses to show appropriate emotional behaviour. Excessive consumption of physical and mental resources over a long period can easily lead to psychological fatigue, thus aggravating emotional exhaustion and depersonalisation. In contrast, deep acting means that nurses can adjust their genuine feelings and understanding to adapt to the situation, and such behaviour of aligning internal feelings with external emotional performance appropriately consumes less physical and mental resources. However, individuals do not need to require more resources to suppress their true emotions,



and they are compensated with patients' emotional reactions, which helps in achieving a balance of psychological resources, in turn, reducing nurses' burn-out. A study by Wang *et al*<sup>60</sup> concluded that the more nurses express their emotions authentically, the more committed they are to their work.

This study showed that nurses' emotional labour was negatively related to psychological resilience and its three dimensions. From this study's results, it would appear that nurses who show more resilience, self-improvement and optimism are more likely to adopt deeper roles in their work and have a higher sense of professional identity. Therefore, it is necessary to improve the psychological well-being of nurses and increase their psychological resilience during the COVID-19 pandemic and other similar events. Some studies have shown that mindfulness-based stress reduction and psychotherapy centred on positive thinking can help reduce nurses' workload stress, help them establish a healthy psychological state,<sup>61</sup> and improve their levels of psychological resilience.<sup>62</sup> Studies have shown that surface acting negatively correlates with job satisfaction, while deep acting has a positive relationship with job satisfaction.<sup>55</sup> This study's results suggest that, by improving nurses' psychological resilience, nurses can be encouraged to engage in more deep acting, which is likely to help increase nurses' professional identity and job satisfaction.

This study provides valuable insights into the current state of burn-out, emotional labour and psychological resilience among gastroenterology nurses during the COVID-19 pandemic. However, the study has several limitations. First, the findings are cross-sectional, precluding the drawing of any conclusions about the impact of COVID-19. Comparison of the findings with pre-pandemic studies requires caution, as the observed status may be due to factors unrelated to the pandemic. Second, this study was only conducted in one province of China using a convenience sampling method, which is not representative of other regions, or of departments and other personnel in hospitals, meaning that these findings are not generalisable. Third, as 98.8% of the participants were female, more attention should be paid to male nurses in the future. Fourth, the difficulty of data collection during the pandemic may have led to possible bias in data interpretation. In addition, the scope of one questionnaire may not be sufficient to summarise nurses' actual levels of burn-out, emotional labour and psychological resilience. Given the possibility of a 'social desirability' effect, nurses' self-reported burn-out may be lower. Therefore, actual burn-out may be higher than the reported results, which would reduce the reliability of the results of this study. The response rate was relatively good, although approximately a quarter of the participants did not respond. As not responding may be a sign of burn-out, this study might have underestimated the prevalence of burn-out among the study population.

## CONCLUSION

This study was conducted during the COVID-19 pandemic to investigate whether the pandemic impacted the psychological state of nurses in relation to burn-out, emotional labour and psychological resilience and to provide guidance for subsequent burn-out prevention and control efforts. Greater adoption of deep acting by nurses can be promoted by improving their psychological resilience, which can help improve emotional labour, thereby reducing burn-out and decreasing turnover rates. Senior management needs to pay attention to the psychological status of nurses. Therefore, qualitative, longitudinal and interventional studies should be conducted to explore the psychological condition of nurses, expand the research indexes of nurses' psychological characteristics, construct models of nurses' psychological resilience, and further track the long-term effects of interventions while evaluating the immediate effects of interventions.

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