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±19.63, 38.79±12.22 and 69.97±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,’ more than 243 million confirmed cases and over 4.9 million deaths had been reported worldwide, as of 24 October 2021.

Annette Kennedy, president of the International Council of Nurses, highlighted that nurses played an important role in maintaining people’s health during the pandemic. However, a shortage of nurses is a global public health issue.

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. 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. Therefore, the workload of gastroenterology nurses is severe and there may be a significant increase in stress co-occurring with the COVID-19 pandemic. And the quality of nursing staff is closely related to the overall satisfaction of the hospital. Studies have shown that the mental health of healthcare providers cannot be ignored and there is a need to enhance their mental health.

As psychological resilience affects nurses’ willingness to leave their profession, 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, 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 and have emphasised the importance of exploring psychological resilience support for healthcare workers with burn-out. 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 in 1974. Maslach and Jackson 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, which is consistent with the findings of Aiken et al. Numerous countries have high rates of burn-out among nurses, such as Japan (35%-60%), South Africa (34.6%) and Spain (21%). Moreover, the total burn-out detection rate among Chinese nurses has been reported to be 69.21%. Additionally, numerous studies have shown that nurses are at high risk of burn-out. 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. This situation seriously affects nurses’ physical and mental health and reduces the quality of nursing care. Furthermore, Luo et al. reported a significant correlation between emotional labour and burn-out.

‘Emotional labour,’ first proposed in 1979 by the American social psychologist Arlie Hochschild, is a term used about employees who consciously manage their emotions at work and display visible external expressions and body movements to the public. Throughout the interdisciplinary literature, emotional labour has two attributes: (1) autonomous or spontaneous emotional expression, also referred to as an autonomic emotional regulation and (2) according to the middle-range theory of emotional labour, 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) and deep acting (ie, expression of deeply felt emotions, and modification of felt emotions to match displayed emotions). 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. In contrast, deep acting implies that nurses connect with patients and project themselves therapeutically. As their work is emotionally intensive, nurses continually confront and manage the negative emotions of patients and their families. Diefendorff et al. 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 and cardiology departments. Frequent and excessive use of emotional labour intensifies nurses’ fatigue and burn-out, which increases their propensity to leave their profession. 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. It is the ability to move forward positively from a negative, traumatic or stressful experience. 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 tended to exhibit optimism, humour, flexibility and high ethical standards. Individuals with higher psychological resilience are better able to deal with stressful situations and, thus, maintain good mental health. 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’.

Although previous studies have explored the relationship between burn-out and emotional labour and between...
burn-out and psychological resilience, 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 ≥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, 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 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. 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 with acceptable reliability.

Chinese version of the Emotional Labour Scale
Grandey 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. 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, 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 51 jointly developed the Connor-Davidson Resilience Scale. This study employed the Chinese version of the scale, translated by Yu et al. 52 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, 52 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 conformed to a normal distribution and those that did not were expressed as mean±SD (x±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 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±19.63 with a mean entry score of 2.41±0.89, with a score of 14.37±13.49 on the dimension of emotional exhaustion, 1.00 (0.00, 5.00) on the dimension of depersonalisation, and 35.18±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±12.22, the mean score of entries was 2.77±0.87 and the mean scores of entries in the three dimensions from highest to lowest, were emotional expression (3.00±1.34), surface acting (2.82±1.21) and deep acting (2.36±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±22.38 and the mean score of the entries was 2.80±0.90, including the score of the toughness dimension (37.47±11.89), the score of the self-improvement dimension (21.29±7.48) and the score of the optimism dimension (11.21±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

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (%)</th>
<th>Burn-out Means±SD</th>
<th>t/t’/F</th>
<th>P value</th>
<th>Emotional labour Means±SD</th>
<th>t/t’/F</th>
<th>P value</th>
<th>Psychological resilience Means±SD</th>
<th>t/t’/F</th>
<th>P value</th>
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</thead>
<tbody>
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<td><strong>Age (years)</strong></td>
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<tr>
<td>&lt;30</td>
<td>166 (48.1)</td>
<td>52.81±21.06</td>
<td>1.21 c</td>
<td>0.305</td>
<td>38.54±12.54</td>
<td>0.74 c</td>
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<td>30–39</td>
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<td>40–49</td>
<td>40 (11.5)</td>
<td>50.73±16.22</td>
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<td>69.55±25.19</td>
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<td>≥50</td>
<td>3 (0.9)</td>
<td>35.67±14.01</td>
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<td>29.33±12.90</td>
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<td>79.00±13.53</td>
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<td>Married</td>
<td>209 (60.5)</td>
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<td>0.579</td>
<td>39.49±12.74</td>
<td>3.37 c</td>
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<td>69.05±23.21</td>
<td>0.12 c</td>
<td>0.951</td>
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<td>Unmarried</td>
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<td>70.53±22.01</td>
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<td>Divorced</td>
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<td>68.88±23.85</td>
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<td>Bereaved spouse</td>
<td>2 (0.6)</td>
<td>49.50±20.51</td>
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<td><strong>No of children</strong></td>
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<td>Two</td>
<td>70 (20.3)</td>
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<td>37.50±4.80</td>
<td>0.26 c</td>
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<td>College</td>
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<td>Bachelor’s degree or higher</td>
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<td>54.11±17.83</td>
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<td>71.97±19.20</td>
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<td>Permanent staff</td>
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<td>37.09±12.52</td>
<td>−2.68b</td>
<td>0.008†</td>
<td>72.60±22.68</td>
<td>2.26 a</td>
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<td>Category labour contract</td>
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<td>&lt;2</td>
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<td>6–10</td>
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<td>52.57±21.29</td>
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<td>11–15</td>
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<td>16–20</td>
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<td>40.42±12.60</td>
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<td>67.97±23.11</td>
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<td>&gt;20</td>
<td>47 (13.6)</td>
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<td>68.15±24.25</td>
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<td><strong>Professional title</strong></td>
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<tr>
<td>Junior</td>
<td>236 (68.4)</td>
<td>53.30±20.53</td>
<td>0.192 c</td>
<td>0.825</td>
<td>38.39±12.46</td>
<td>3.460 c</td>
<td>0.033*</td>
<td>69.86±22.35</td>
<td>1.349 c</td>
<td>0.261</td>
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<td>Middle</td>
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<td>Subsenior and senior</td>
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<td>26.60±13.76</td>
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<td>86.20±11.99</td>
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<tr>
<td><strong>Directly supervising nursing interns</strong></td>
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<tr>
<td>No</td>
<td>179 (51.9)</td>
<td>50.68±20.30</td>
<td>−2.36 a</td>
<td>0.019*</td>
<td>38.50±12.29</td>
<td>−0.46 a</td>
<td>0.649</td>
<td>69.69±22.18</td>
<td>−0.25 a</td>
<td>0.805</td>
</tr>
<tr>
<td>Yes</td>
<td>166 (48.1)</td>
<td>55.64±18.60</td>
<td></td>
<td></td>
<td>39.10±12.16</td>
<td></td>
<td></td>
<td>70.28±22.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued
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 results of the Pearson correlation analysis showed that the nurses' burn-out was positively correlated with their total psychological resilience scores ($r=0.303, p<0.001$) and that their burn-out was positively correlated with two dimensions of psychological resilience, namely, self-improvement ($r=0.322, p<0.001$) and optimism ($r=0.297, p<0.001$).

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 ($r=-0.332, p<0.001$), and optimism ($r=-0.297, p<0.001$).

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 psychological resilience of the nurses

The results of the multiple linear regression analysis showed that the monthly income of the nurses was a statistically significant predictor of psychological resilience, as detailed in Table 1.
predictor of psychological resilience, with a positive effect, as detailed in \textbf{Table 3}.

\textbf{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.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|}
\hline
\textbf{Variables} & \textbf{B} & \textbf{SE} & \textbf{b} & \textbf{P value} & \textbf{R}^2 & \textbf{Adjusted R}^2 & \textbf{F} & \textbf{P value} \\
\hline
\textbf{Burn-out} & & & & & & & & \\
Constant & 43.106 & 3.068 & 14.050 & <0.001 & 0.038 & 0.032 & 6.753 & 0.001 \\
No of days per month working at night & 3.236 & 1.157 & 0.149 & 2.798 & 0.005 & 0.044 & 0.033 & 3.940 & 0.004 \\
Directly supervising nursing interns & 4.715 & 2.082 & 0.120 & 2.265 & 0.024 & & & & \\
\hline
\textbf{Emotional labour} & & & & & & & & \\
Constant & 36.703 & 0.971 & 37.811 & <0.001 & 0.044 & 0.033 & 3.940 & 0.004 \\
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 & & & & \\
\hline
\textbf{Psychological resilience} & & & & & & & & \\
Constant & 56.286 & 4.574 & 12.307 & <0.001 & 0.027 & 0.024 & 9.607 & 0.002 \\
Monthly income & 5.447 & 1.757 & 3.100 & 0.002 & & & & & \\
\hline
\end{tabular}
\caption{Results of multiple linear regression in terms of MBI-CH, ELS-CH and PRS-CH scores}
\end{table}

ELS-CH, Chinese version of the Emotional Labour Scale; MBI-CH, Chinese version of the Maslach Burnout Inventory; PRS-CH, Chinese Psychological Resilience Scale.
Many studies have reported variations in burnout levels among different groups of nurses. Liang et al. 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 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, 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. This may be related to the fact that Wu et al surveyed 11337 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.

In this study, the psychological resilience scores were higher than those of Ashari et al. 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. 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.

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. 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, 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. 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, and improve their levels of psychological resilience. Studies have shown that surface acting negatively correlates with job satisfaction, while deep acting has a positive relationship with job satisfaction. 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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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ethics Committee of the First Affiliated Hospital of Fujian Medical University (MRCTA, ECFAH of FMU (2021)393). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. Data are available from HL (email: fjyflykyxx@163.com) on reasonable request.

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REFERENCES

Intensive care units and hospital emergency services. Nurses' perceptions and demands regarding COVID-19 nursing work environment and nursing job burnout (Chinese version).

Nursing and prevalence of burnout syndrome in the nursing profession.


Poghosyan L, Aiken LH, Sloane DM. Factor structure of the burnout inventory: an analysis of data from large scale cross-sectional surveys of nurses.


Maslach C, Jackson SE. The measurement of experienced burnout.


Poghosyan L, Aiken LH, Sloane DM. Factor structure of the Maslach burnout inventory: an analysis of data from large scale cross-sectional surveys of nurses from eight countries.


van der Colff JJ, Rothmann S. Burnout of registered nurses in South Africa.


Tian B, Liu W, Cai S. Research of the status and correlation between nursing work environment and nursing job burnout (Chinese version).

Journal of Nursing Administration 2017;17:10–11.


Front Psychol 2015;6:165.


Enns V, Currie S, Wang J. Professional autonomy and work setting as contributing factors to depression and absenteeism in Canadian nurses.

54 Li J. To explore the different of nurses' job burnout between oral hospitals and general hospital(Chinese version). *Journal of Frontiers of Medicine* 2018;8:387–8.