Original Article

Changes in primary healthcare workforce burnout during and after the termination of COVID-19 emergency response: A one-and-half-year observational study

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Abstract

Background: Primary healthcare workforce (PHCW) should be suffered from less burnout after the termination of the COVID-19 response. The current study compared the changes in the three dimensions of burnout in PHCW during and after the response. **Methods:** Two convenience-sampling, online, cross-sectional questionnaire studies were conducted in local PHCW. Studies were administered in April 2022 and 8 months after the termination. Burnout was measured by the Chinese version of 15-item Maslach Burnout Inventory-General Survey, which assesses three dimensions: emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (reduced PA). The primary outcome was the prevalence of its three dimensions. Data on demographics, work environment, health conditions, and outlets for stress reduction were collected. We compared burnout and associated factors between the study periods by using Student's *t*-test, Chi test, or Mann–Whitney test. The association between factors and burnout was identified by a logistic regression model. **Results:** In total, 162 and 200 participants completed the questionnaires during and after the response. No significant differences in demographics, including age, gender, education attainment, work experience, or seniority level were observed. The prevalence of burnout-free status was similar (9.9% vs 12.5%, $P = 0.434$) between the two periods. Severe burnout decreased from 45.7% to 0%, and moderate burnout nearly doubled after the response. The prevalence of EE decreased the most, by 55.0%, followed by that of DP, which decreased by 38.4% (all $P < 0.001$); however, there was no difference in the prevalence of reduced PA (77.2% vs 74.5%, $P = 0.557$). Logistic regression showed that promotion and alcohol consumption decreased the risk of EE. Considering leaving the job increases the risk of DP, a lower self-evaluated health score and more distress were associated with EE and DP. Exercise decreased the risk of reduced PA. **Conclusions:** Inconsistent with the hypothesis, we found that severe burnout decreased, but moderate burnout increased in PHCWs after the response. EE and DP decreased more, but reduced PA had no change. Incentives, improved self-evaluated health conditions, alcohol consumption, and exercise ameliorate burnout. Healthcare policy makers must consider multiple effective ways to mitigate burnout in the post-epidemic era.

Keywords: Burnout, COVID-19, primary healthcare workforce

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Introduction

Burnout is a work-related syndrome involving emotional exhaustion (EE), depersonalization (DP), and a sense of

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reduced personal accomplishment (PA). EE is defined as feeling overworked, overextended, and incapable of showing compassion, leading to significant mental distress. DP includes feelings of treating patients as objects rather than as human beings and becoming more callous toward patients. PA encompasses feelings of ineffectiveness in helping patients with their problems and a lack of value of the results of work-related activities such as patient care or professional achievements.[1] Burnout thus has negative consequences for patient care, the physician workforce, and the health care system.[1,2] Age, gender, marital status, work environment, interpersonal and professional conflicts, emotional distress, low social support, having less education, having an intermediate professional title, and having a permanent contract or working more hours were related to burnout.[3,4]

A strategy priority of China's primary healthcare workforce (PHCW) is to provide citizens with universal and equitable access to high-quality health care for chronic diseases and infectious diseases.[5] Half of PHCW in China suffered from burnout before the COVID-19 response[6] due to workforce shortages and increased workloads. Guangzhou, for example, the largest port city in southern China, has 18 million permanent citizens; only 41 thousand (41,301) qualified PHCW were in service by the end of 2021.

The COVID-19 pandemic has resulted in high levels of stress on healthcare workers and has caused great burnout globally.[7] The workload from providing vaccination services, conducting epidemiological investigations and massive nucleic acid screenings among the whole population, imposing strict quarantine measures on both local close contacts and international arrivals,[8] was so heavy that most PHCW had to work for more than 60 hours per week during the response.[9] As the first group on the frontline to fight for the first COVID-19 Omicron wave in April, 2022, Guangzhou's HCW must endure tremendous stress. After 7 months of consecutive implementation of the dynamic zero policy, on November 30, 2022, the local government declared that it would implement the accommodated control policy. Thirty-nine days later, on January 8, 2023, the national response was terminated. Given that normal primary healthcare work was usually suspended because of the response, the stress related to accumulative workload and working in primary healthcare over the course of a 3-year pandemic may have residual, long-term effects on both primary healthcare workforce and patients.[10] To better understand the long-term effect of the COVID-19 response on burnout, the work environment, health conditions, and behaviors in PHCW, we conducted two cross-sectional studies during the COVID-19 epidemic response and after the termination of the response. It is hypothesized that the prevalence of burnout decreases after the termination of response.

Methods

An anonymous e-questionnaire, including social demographic variables, self-evaluated health conditions, and 15 items from the Maslach Burnout Inventory scale (MBI-GS, Chinese version),[6] was administered to PHCW from 60 primary healthcare centers. The e-questionnaire link was to the working group of WeChat during the third year of COVID-19 response (April 2022) and 8 months after the termination of the response (September 2023). The recruitment strategy was to distribute the study widely to maximize the number and diversity of respondents. This involved convenience sampling by invitation to complete the anonymous survey. PHCW who were willing to participate in the research completed the e-questionnaires without payment. Informed consent was obtained during data collection. This research was approved by the Guangzhou Centers for Disease Control and Prevention Ethics Committee. The survey consisted of three parts as follows.

Part 1 investigated demographic information, including age, gender, education attainment, seniority level, practicing years, and profession.

Part 2 investigated the PHCW's work status and health status (physical, health behaviors, and psychological conditions). This included changes in income, promotion, and consideration of leaving the job, with each question asking respondents to indicate 'Yes' or 'No' response and working hours. A question on physical health was presented as 'How do you feel about your health, including your physical and mental health?', which was tailored on a Likert scale (0–10) from '0 is the worst, 10 is the finest'. A question on distress is 'Does work pressure bring you distress during the last week (yes/no)?' A question on sleep deprivation is 'How about your sleep quality during the past week (mild, moderate, severe)?

In part 3, burnout was measured using the Chinese version of the MBI-GS, which consists of 15 questions measuring three distinct dimensions of burnout: emotional exhaustion (5 questions), depersonalization (4 questions), and reduced personal accomplishment (6 questions). Each dimension is scored individually on a Likert scale (0–6), with each question asking respondents to describe the frequency (from 'never' to 'every day') with which they experience the statement. A reduced PA was reversely scored. The burnout scores for each category were calculated using the MBI tool and are reported as the mean and standard deviation as recommended.[7] Higher EE and DP scores and lower PA scores represent greater burnout. The following equation was adopted to calculate the weighted sum score of burnout:

$$\text{Burnout} = (0.4 * \text{EE} + 0.3 * \text{DP} + 0.3 * \text{reduced PA})/5$$

The cutoff points were used to classify the participants into the three following groups based on their score: group 1, no burnout (0–1.49); group 2, moderate burnout (1.50–3.49); and group 3, severe burnout (3.5–6.0). The criteria used to indicate the presence of EE, DP, and reduced PA were the average scores of the items for subcomponents ≥ 3.2, >2.2, and ≤ 4.0, respectively.

Data analysis

The results were exported and analyzed using IBM SPSS (version 26). Descriptive statistical analyses were reported

using the mean (SD) for normally distributed continuous variables or using the median (1st, 3rd quartile) when a normal distribution was not met. Categorical variables are presented as frequencies (relative frequencies of our valid data). Binary logistic regression with multiple variables was used to estimate the associations between different demographic characteristics of participants and various risk factors and burnout. All tests were two-sided, and *P* was considered significant if it was ≤ 0.05.

Results

A total of 162 and 200 PHCW from primary healthcare centers participated in this survey [Table 1].

The respondents were more likely to be female (71.3%), younger (mean age = 35.0 ± 6.9), and highly educated with a bachelor's degree (82.9%), to have middle seniority (49.7%), and to have nearly 12.5 years of working experience. No significant difference in demographics was observed between the two groups during and after the response. The rate of salary increase and promotion increased, but considering leaving the job, self-reported distress and severe sleep deprivation decreased significantly after the response (all $P < 0.001$). The number of working hours per week decreased from 45 to 40, and self-evaluations of health increased from 6 to 7 (both $P < 0.001$).

The prevalence of burnout in the two groups is shown in Table 2. The overall prevalence of burnout during the survey was 90.1%, with moderate and severe burnout accounting for 44.4% and 45.7%, respectively. No individual experienced severe burnout, but 87.5% experienced moderate burnout after the termination of the study. No significant difference was observed between the two groups in the overall incidence of burnout ($\chi^2 = 0.613$, $P = 0.434$). The prevalence of EE was the highest in three dimensions during the COVID-19 response, while reduced PA was the highest after the response. Both EE and DP decreased significantly, but reduced PA had no change.

Table 3 presents the variables associated with the prevalence of the three dimensions of burnout. After adjusting for age, gender, education, and level of seniority, logistic regression models indicated that individuals who had no job promotion (OR = 6.06, 95% CI: 2.07–17.76) and who felt more distress (OR = 7.72, 95% CI: 3.43–17.38) faced a greater risk of having EE. Individuals who had higher self-evaluated health scores (OR = 0.63, 95% CI: 0.49–0.80) and who consumed alcohol (OR = 0.32, 95% CI: 0.13–0.79) had a lower risk of having EE. Those who felt more distress (OR = 3.53, 95% CI: 1.86–6.70) faced a greater risk of having DP, but those who did not consider leaving their job (OR = 0.25, 95% CI: 0.13–0.50) and had a greater self-evaluated health score (OR = 0.69, 95% CI: 0.56–0.84) faced a lower risk of having DP. Exercise was associated with a lower incidence of reduced PA (OR = 0.48, 95% CI: 0.26–0.90). Compared to during the response, both the risk of having EE and DP decreased significantly after the response (EE, OR: 0.024, 95% CI: 0.007 to 0.092; DP, OR: 0.117, 95% CI: 0.043, 0.317). No differences in reduced PA were detected between during and after the response.

Table 1: Demographics, of participants during and post the response

Characteristic	During	After	*P*
Total No.	162 (100)	200 (100)	
Age (Mean, SD)	36.0 (5.3)	35.6 (6.9)	0.601
Work experience years (Mean, SD)	12.6 (5.8)	12.4 (7.3)	0.806
Gender (*n*, %)			
Males	52 (32.1)	52 (26.0)	0.202
Education (*n*, %)			
>Bachelors	137 (83.6)	163 (80.5)	0.708
Level of seniority (*n*, %)			
Junior	75 (46.3)	86 (43.0)	0.723
Middle	79 (48.8)	101 (50.5)	
Senior	8 (4.9)	13 (6.5)	

Table 2: Comparison of three dimensions of burnout, working status, health condition, and behaviors during and after the response

Measurement	During	After	*P*
No burnout (*n*, %)	16 (9.9)	25 (12.5)	<0.001
Moderate burnout (*n*, %)	72 (44.4)	175 (87.5)	
Severe burnout (*n*, %)	74 (45.7)	0 (0.0)	
Dimensions of burnout			
EE (*n*, %)	145 (89.5)	69 (34.5)	<0.001
DP (*n*, %)	123 (75.9)	75 (37.5)	<0.001
Reduced PA (*n*, %)	125 (77.2)	149 (74.5)	0.557
Raise in salary (*n*, %)	13 (8.0)	55 (27.5)	<0.001
Promotion (*n*, %)	7 (4.3)	38 (19.0)	<0.001
Consider leaving the job (*n*, %)	83 (51.2)	55 (27.5)	<0.001
Working hours weekly (Median, P25, P75)	45 (40,53)	40 (38,44)	<0.001
Self-evaluation on health (Median, P25, P75)	6 (5,7)	7 (6,8)	<0.001
Self-reported distress (*n*, %)	124 (76.5)	97 (48.5)	<0.001
Sleep Deprivation (*n*, %)			
Mild	17 (10.5)	39 (19.5)	<0.001
Moderate	87 (53.7)	124 (62.0)	
Severe	58 (35.8)	37 (18.5)	
Outlets for stress reduction (*n*, %)			
Smoking	6 (3.7)	5 (2.5)	0.507
Alcohol consumption	10 (6.2)	6 (3.0)	0.144
Exercise	61 (37.7)	92 (46.0)	0.110
Overeating	50 (30.9)	49 (24.5)	0.177

Discussion

Same as previous studies,[11-13] nearly half of PHCWs suffered from severe burnout during the pandemic. Inconsistent with hypothesis, the prevalence of moderate burnout doubled, although the prevalence of severe burnout dropped to zero. Burnout in health care workers should be improved once risk factors are reduced, for example,[14,15] adequate protective wearing,

Table 3: Effects of each variable on three dimensions of burnout

Variables	EE		DP		Reduced PA	
	P	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)
Work experience years	0.491	1.03 (0.94, 1.13)	0.915	1.00 (0.93, 1.09)	0.104	1.06 (0.99, 1.14)
Working hours/week	0.328	1.03 (0.97, 1.09)	0.352	0.98 (0.95, 1.02)	0.320	0.98 (0.95, 1.02)
Raise in salary (None)	0.960	0.98 (0.42, 2.31)	0.569	0.81 (0.38, 1.70)	0.930	0.97 (0.48, 1.97)
Promotion (Yes)	0.001	6.06 (2.07, 17.76)	0.476	1.31 (0.62, 2.76)	0.572	0.83 (0.43, 1.60)
Consider leaving the job (No)	0.352	1.50 (0.64, 3.50)	<0.001	3.94 (1.99, 7.81)	0.432	0.76 (0.39, 1.50)
Self-evaluation on health (Score)	<0.001	0.63 (0.49, 0.80)	<0.001	0.69 (0.56, 0.84)	0.703	0.97 (0.82, 1.15)
Outlets for stress reduction						
Smoking (No)	0.119	4.34 (0.68, 27.55)	0.154	2.96 (0.67, 13.2)	0.220	2.40 (0.59, 9.70)
Alcohol consumption (No)	0.013	0.32 (0.13, 0.79)	0.881	0.95 (0.46, 1.94)	0.763	1.11 (0.56, 2.23)
Exercise (No)	0.597	1.24 (0.56, 2.71)	0.180	1.54 (0.82, 2.87)	0.022	0.48 (0.26, 0.90)
Overeating (No)	0.325	0.68 (0.32, 1.47)	0.481	0.8 (0.43, 1.49)	0.929	1.03 (0.58, 1.81)
Distress (No)	<0.001	7.72 (3.43, 17.38)	<0.001	3.53 (1.86, 6.70)	0.069	1.87 (0.95, 3.68)
Sleep Deprivation (Mild)						
Moderate	0.221	1.91 (0.68, 5.39)	0.923	0.96 (0.40, 2.28)	0.187	1.66 (0.78, 3.50)
Severe	0.331	1.99 (0.50, 7.92)	0.262	0.53 (0.17, 1.61)	0.708	1.21 (0.45, 3.26)
Study period (During the response)	<0.001	0.02 (0.01, 0.09)	<0.001	0.12 (0.04, 0.32)	0.864	0.93 (0.39, 2.21)

fewer shifts, and sufficient personal rest time. However, health care workers still experienced adverse psychological impacts from severe acute respiratory syndrome (SARS) outbreaks[16] or COVID-19 pandemic.[17] In our study, although PHCWs reported their working hours per week decreased from 45 to 40, they complained that they were "tired" of so much paperwork and more performance examination rather than matched incentives. Professional dissonance caused by less "doctor" work and more "office" work and undervalued by local institutions and the health system was a factor in increasing burnout in primary care practitioners.[18] Higher distress and anxiety were associated with higher burnout.[19] Among the three dimensions, the percentage of EE and DP improved significantly, while reduced PA did not differ. However, reduced PA was greater than a previous review of 60% of primary health-care professionals in low- and middle-income countries.[20] The result indicated that opportunities for further education, professional development, and career progression for PHCW are extremely limited.[5]

Logistic regression revealed that the prevalence of both EE and DP decreased (EE: 55.0%, DP: 38.4%) significantly due to the termination of the response. Consistent with previous studies,[21,22] participants who had a job promotion and high self-evaluated health score face a lower risk of having EE, who had no consideration of leaving the job, and who have a high self-evaluated health condition face a lower risk of having DP. For individual level, burnout may be improved by stress reduction via modifying health-related behaviors, for example, increasing physical activity, abusing alcohol and tobacco, and overeating. Alcohol consumption was negatively associated with EE, and exercise was negatively associated with reduced PA in the present study. Increased alcohol use is associated with work-related stress caused by COVID-19 among healthcare workers (HCWs)[23] who most commonly use or abuse alcohol, prescription drugs, and nonprescription drugs (opiates, illicit drugs) to reduce stress.[24] Exercise is protective against burnout and its three dimensions.[25,26] Alcohol consumption decreased, but exercise increased slightly, indicating that unhealthy behavior for stress reduction was not maintained for a long time. In fact, healthcare professionals' health-related behaviors are better than those of the general population.[27] Higher distress is associated with higher EE and DP, suggesting the pandemic may have a long-term negative impact on psychology health and therefore influence burnout of PHCW.

Our study highlights the effectiveness of postepidemic healthcare policies on burnout in PHCW and shows that job promotion, incentives, improved self-evaluated health conditions, alcohol consumption, and exercise play crucial roles in reducing the risk of burnout among PHCW. Furthermore, the findings emphasize that a healthy work–life balance can help mitigate the negative effects of stress and burnout. Managers and healthcare centers should be proactive in identifying and addressing the risk factors associated with emotional exhaustion and depression, such as high distress and alcohol consumption. However, it is important to note that our study has some limitations. The cross-sectional design prevents us from drawing conclusions about the causal relationship between the factors studied and the outcomes. Self-selection bias is possible if respondents are motivated to complete the survey due to their high levels of mental and physical stress and burnout. Moreover, the sample size was limited. Future studies should aim to replicate and expand upon these findings by considering longitudinal designs to better understand the complex relationships between PHCW well-being and the factors that contribute to burnout.

Conclusions

Severe burnout was improved, but moderate burnout was deteriorated in PHCWs after the termination of the response. EE and DP decreased more; reduced PA had no change. Incentives,

improved self-evaluated health conditions, alcohol consumption, and exercise ameliorated burnout. Healthcare policy makers must consider multiple effective ways to mitigate burnout in the post-epidemic era.

Consent for publication

All the authors provided their consent for publication.

Availability of data and materials

The data will be available upon reasonable request.

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Conflicts of interest

There are no conflicts of interest.

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