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# A Comparison of Burnout Frequency Among Oncology Physicians and Nurses Working on the Frontline and Usual Wards During the COVID-19 Epidemic in Wuhan, China



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## Abstract

**Context.** The epidemic of coronavirus disease 2019 (COVID-19) was first identified in Wuhan, China and has now spread worldwide. In the affected countries, physicians and nurses are under heavy workload conditions and are at high risk of infection.

**Objectives.** The aim of this study was to compare the frequency of burnout between physicians and nurses on the frontline (FL) wards and those working in usual wards (UWs).

**Methods.** A survey with a total of 49 questions was administered to 220 medical staff members from the COVID-19 FL and UWs, with a ratio of 1:1. General information, such as age, gender, marriage status, and the Maslach Burnout Inventory—medical personnel, were gathered and compared.

**Results.** The group working on the FLs had a lower frequency of burnout (13% vs. 39%;  $P < 0.0001$ ) and were less worried about being infected compared with the UW group.

**Conclusion.** Compared with medical staff working on their UWs for uninfected patients, medical staff working on the COVID-19 FL ward had a lower frequency of burnout. These results suggest that in the face of the COVID-19 crisis, both FL ward and UW staff should be considered when policies and procedures to support the well-being of health care workers are devised. *J Pain Symptom Manage* 2020;60:e60–e65. © 2020 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

## Key Words

COVID-19, medical staff, burnout

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## Key Message

This study focused on the burnout frequency of medical staff working on different workplaces in the

epicenter of the coronavirus disease 2019 pandemic. Our results suggest that in the face of the coronavirus disease 2019 crisis, both frontline ward and usual ward staffs should be considered.

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## Introduction

The coronavirus disease 2019 (COVID-19) pandemic, first identified in Wuhan, China, and now spread worldwide,<sup>1–4</sup> has raised concerns about the well-being of frontline (FL) health care workers.<sup>5–14</sup> To efficiently stop the spread of disease, general hospitals were deployed to the FL for infected patients with severe symptoms, whereas several Wuhan's sports stadiums and convention centers were renovated into mobile hospitals to treat patients with mild symptoms. Medical staff from different backgrounds were dispatched to these sites to care for more than 40,000 infected patients in the city.<sup>15–17</sup>

COVID-19 is transmitted primarily by respiratory droplets and close contact, and health care workers are at high risk of exposure.<sup>5,12,13,18</sup> Several studies have also reported that medical staff also experience depression and anxiety because of the COVID-19 outbreak.<sup>7,12,14</sup> Because of increasing patient volumes, medical professionals who are not specialized in infectious disease gathered to support the FL<sup>6</sup> and may experience even greater pressure when facing infected patients. Burnout is receiving increasing recognition as a serious problem among medical professionals.<sup>19–21</sup> Currently, no studies have compared the burnout frequency of noninfectious disease specialist health care workers at the FL of the outbreak vs. their colleagues practicing in their usual wards (UWs).

To support the FL, 173 oncology-specialized physicians and nurses were dispatched from Hubei Cancer Hospital (HCH), a specialized tertiary hospital with 2000 beds in Wuhan. We conducted a survey to explore and compare the burnout frequency of physicians and nurses from HCH who worked in the FL, defined as one designated hospital, Leishenshan Hospital, and three mobile hospitals, vs. their colleagues from the same institution who remained in their UW.

## Methods

The Institutional Review Board of HCH approved the survey and protocol. Two hundred twenty physicians and nurses from HCH were invited to enroll in this study. The ratio of FL vs. UW was 1:1. The survey was conducted from March 13, 2020 to March 17, 2020. The survey included 15 demographic questions and questions regarding participants' status in the past two months, and the Maslach Burnout Inventory—medical personnel.<sup>22</sup> Participants were assured of complete anonymity. Burnout was defined as a high level of emotional exhaustion greater than 27 and/or a high level of depersonalization greater than 10.<sup>23</sup> We separately considered the frequency of

participants with a low sense of personal accomplishment (PA) less than 31.

## Statistical Analysis

We applied standard descriptive statistics to summarize the responses to all survey questions, including median, interquartile range, and range for continuous variables and frequency and proportion for categorical variables. Chi-squared test was used to assess the difference of frequencies of burnout between the FL and the UW.

## Results

Of 220 (86%) invited participants, a total of 190 participants completed the survey. All cases in the sample were valid to be analyzed. There were 96 participants who worked in the FL. The demographic characteristics of participants are summarized in [Table 1](#). Most of the participants were from the Department of Medical Oncology.

Previous work has suggested that the number of years of experience, number of hours worked per week, frequency of working on weekends, and number of personnel in a person's team or practice may be associated with burnout.<sup>24</sup> Results of these variables for FL and those working in their UW are summarized in [Table 1](#).

The Maslach Burnout Inventory is the gold standard for evaluating burnout.<sup>22,25–27</sup> The frequency of burnout is significantly lower in the FL group than in the UW group (13% vs. 39%;  $P < 0.0001$ ). The frequency of a low level of PA is lower in the FL group than in the UW group (39% vs. 61%;  $P = 0.002$ ; [Table 2](#)).

We asked questions about participants' attitudes toward the effect of COVID-19 ([Table 3](#)). More participants from the FL (76%) strongly disagree or disagree that he and/or she feels more burnout now compared with before the COVID-19 crisis. Participants continuing to work in their UWs were more worried about themselves or a family member becoming infected. Both groups indicated similar worry that the COVID crisis will continue for a long time.

## Discussion

As COVID-19 spreads worldwide, more medical professionals will be needed to address the crisis. To our knowledge, this is the first study focusing on and comparing the burnout frequency of medical staff working on the FL vs. those working in their UW in the epicenter of the COVID-19 pandemic. In our survey, we observed that participants from the FL had a

Table 1  
Participant Characteristics, N = 190

Characteristics	FL, N = 96 (%)	UW, N = 94 (%)	Total, N = 190 (%)
Age (median, IQR)	33 (30, 37)	32 (28, 36)	33 (29, 37)
Gender			
Female	69 (72)	88 (94)	157 (83)
Occupation			
Nurse	55 (57)	61 (65)	116 (61)
Marital status			
Married	64 (67)	66 (70)	130 (68)
Single/separated/divorced	32 (33)	28 (30)	60 (32)
Specialty			
Medical oncology	44 (46)	59 (63)	103 (54)
Radiation oncology	8 (8)	33 (35)	41 (23)
Surgery	37 (39)	2 (2)	39 (20)
Other <sup>a</sup>	7 (7)	0 (0)	7 (3)
How long have you been practicing? (yrs)			
Less than one	2 (2)	2 (2)	4 (2)
One to five	20 (21)	19 (20)	39 (20)
Six to 10	34 (35)	36 (38)	70 (37)
11–15	23 (24)	19 (20)	42 (22)
More than 15	17 (18)	18 (20)	35 (19)
On average, for how many hours a week did you work in the past two months?			
<10	10 (10)	10 (10)	20 (11)
11–20	22 (23)	6 (6)	28 (15)
21–40	46 (49)	56 (60)	102 (54)
41–60	12 (12)	18 (20)	30 (16)
61–80	3 (3)	2 (2)	5 (2)
>80	3 (3)	2 (2)	5 (2)
How often did you work on weekends for the past two months?			
Never	22 (23)	28 (30)	50 (26)
Every two weeks	13 (14)	20 (21)	32 (17)
Every week (one day)	43 (45)	41 (44)	84 (44)
Every week (two days)	18 (19)	5 (5)	23 (13)
Number of personnel in the team; median (IQR)			
Nurses	31 (8, 48)	15 (13, 17)	16 (11, 40)
Physicians	13 (10, 20)	6 (5, 7)	7 (5, 13)

FL = frontline; UW = usual ward; IQR = interquartile range.

<sup>a</sup>Includes both intensive care unit and Chinese medicine.

significantly lower frequency of burnout in the past two months during the COVID-19 crisis. Moreover, FL workers were also less worried about becoming infected despite working directly with infected patients.

Although known risk factors, such as practice size, years of experience, and marital status, were similar between the groups (Table 1), burnout frequency was lower in FL staff. Several explanations could account for this unexpected trend. One possible

explanation is that by directly addressing COVID-19, participants from the FL may have felt a greater sense of control of their situation; control in the workplace is thought to be a major driver of engagement and important for avoiding burnout.<sup>22,25,28</sup> Those working in their UWs may have perceived less control over new policies and procedures enacted to keep staff and patients safe, and in contrast to facing COVID-19 head-on, these workers may have had a sense that the virus could impact their workplace at any time, regardless of those policies. In addition, patients with cancer are particularly vulnerable to viral infection, and the COVID-19 pandemic has frequently necessitated suspension of cancer treatment and clinical trials;<sup>4,29</sup> these situations may add additional workplace stress to oncology professionals working in their UWs.<sup>13,30,31</sup>

It is also possible that those at the FL may have felt closer to the key decision makers and have had access to more timely and accurate information.<sup>25,28,32</sup> PA, a

Table 2  
Comparison of Medical Personnel in the FL With Usual Cancer Ward

Burnout Frequency by Different Methods	Total, N = 190 (%)		P
Burnout frequency (by Method 2: EE >27 and/or DP >10)	12 (13)	37 (39)	<0.0001
Burnout frequency (by PA <31)	37 (39)	57 (61)	0.002

FL = frontline; EE = emotional exhaustion; DP = depersonalization; PA = personal achievement.

Table 3  
Attitudes Toward COVID-19

Statement	FL, N = 96 (%)	UW, N = 94 (%)
I feel more burnout now as compared with before the crisis of COVID		
Agree/strongly agree	14 (15)	29 (31)
Neither agree nor disagree	9 (9)	20 (21)
Disagree/strongly disagree	73 (76)	45 (48)
I am worried about becoming infected		
Agree/strongly agree	49 (51)	72 (76)
Neither agree nor disagree	18 (19)	7 (7)
Disagree/strongly disagree	29 (30)	15 (16)
I am worried about my family becoming infected		
Agree/strongly agree	63 (65)	82 (87)
Neither agree nor disagree	8 (8)	4 (4)
Disagree/strongly disagree	25 (26)	8 (8)
I am worried about this going for too long		
Agree/strongly agree	43 (45)	57 (61)
Neither agree nor disagree	21 (22)	23 (24)
Disagree/strongly disagree	32 (33)	14 (14)

COVID-19 = coronavirus disease 2019; FL = frontline; UW = usual ward.

key dimension of burnout that is often neglected in studies of health care workers but is receiving increasing recognition,<sup>22,33</sup> may have also played a role: the FL staff may have felt a deeper sense of personal achievement as they saw the direct results of their care for patients affected by the COVID-19 crisis, and ultimately saw the abatement of the epidemic in Wuhan.

Much attention is paid to those who work directly with infected patients.<sup>11,12</sup> In reality, the entire health care system is impacted by COVID-19. Beyond the FL, the working life of physicians and nurses is highly disrupted even in their usual hospital wards. New policies and procedures, the stress of both staff and patients, and the prospect that infected individuals (staff or patients) could be identified in the workplace at any time may be sources of burnout for non-FL staff. Given the known detrimental impact of burnout on patient care and health care worker well-being,<sup>34–38</sup> our results suggest that the well-being of staff working in their usual workplace may be negatively impacted by the pandemic and is deserving of future attention and additional research.

The workers surveyed here all hailed from the oncology specialty. Oncology has its own set of risks for burnout,<sup>33,39–43</sup> and those working on the FL were not just in a different setting but practicing in a tense environment outside the context of their particular expertise.<sup>40</sup>

This study has several limitations. First, the study used a small group size stemming from the medical staff of a single institution. Second, although participants were assured of their anonymity, worry about identification may have caused participants to score low on burnout questions. Moreover, even with an 86% response rate, selection bias may also have

skewed our results if either highly distressed staff members or those who felt little distress chose not to participate. Finally, it is important to note that our survey was conducted in March 2020, when COVID-19 was generally considered to be under control in China; our study has no way to ascertain the burnout status of medical staff members at the onset or peak period of Wuhan's COVID-19 crisis. Future research should be aimed at specific groups, incorporate more inception points in local epidemics, and collect more comprehensive data on the well-being of medical staff in the COVID-19 crisis.

### Conclusion

Compared with medical staff working in their UW for uninfected patients, medical staff working on the FL had a lower frequency of burnout. It will be important to consider both health care workers on the FL and those in their usual work setting in the COVID-19 crisis.

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## References

1. Arshad Ali S, Baloch M, Ahmed N, Arshad Ali A, Iqbal A. The outbreak of Coronavirus Disease 2019 (COVID-19)—an emerging global health threat. *J Infect Public Health* 2020; 13:644–646.
2. Ammad Ud Din M, Boppana LKT. An update on the 2019-nCoV outbreak. *Am J Infect Control* 2020. <https://doi.org/10.1016/j.ajic.2020.01.023> [Epub ahead of print].
3. Carlos WG, Dela Cruz CS, Cao B, Pasnick S, Jamil S. Novel Wuhan (2019-nCoV) coronavirus. *Am J Respir Crit Care Med* 2020;201:P7–P8.
4. Tang JW, Tambyah PA, Hui DSC. Emergence of a novel coronavirus causing respiratory illness from Wuhan, China. *J Infect* 2020;80:350–371.
5. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. *JAMA* 2020. <https://doi.org/10.1001/jama.2020.3972> [Epub ahead of print].
6. Chen C, Zhao B. Makeshift hospitals for COVID-19 patients: where health-care workers and patients need sufficient ventilation for more protection. *J Hosp Infect* 2020. <https://doi.org/10.1016/j.jhin.2020.03.008> [Epub ahead of print].
7. Chen Q, Liang M, Li Y, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;7:e15–e16.
8. Choi KR, Skrine Jeffers K, Logsdon MC. Nursing and the novel coronavirus: risks and responsibilities in a global outbreak. *J Adv Nurs* 2020. <https://doi.org/10.1111/jan.14369> [Epub ahead of print].
9. Dewey C, Hingle S, Goelz E, Linzer M. Supporting clinicians during the COVID-19 pandemic. *Ann Intern Med* 2020. <https://doi.org/10.7326/M20-1033> [Epub ahead of print].
10. Joob B, Wiwanitkit V. Traumatization in medical staff helping with COVID-19 control. *Brain Behav Immun* 2020. <https://doi.org/10.1016/j.bbi.2020.03.020> [Epub ahead of print].
11. Kang L, Li Y, Hu S, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* 2020;7:e14.
12. Koh D. Occupational risks for COVID-19 infection. *Occup Med (Lond)* 2020;70:3–5.
13. Liang W, Guan W, Chen R, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol* 2020;21:335–337.
14. Rimmer A. Covid-19: give NHS staff rest spaces and free parking not thank yous, says doctor. *BMJ* 2020;368:m1171.
15. Feng ZH, Cheng YR, Chen J, et al. Chinese medical personnel against the 2019-nCoV. *J Infect* 2020;80:578–606.
16. Han Q, Lin Q, Jin S, You L. Coronavirus 2019-nCoV: a brief perspective from the front line. *J Infect* 2020;80: 373–377.
17. World Health Organization. Report of the WHO-China joint mission on coronavirus disease 2019 (COVID-19). 2020. Available from <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>. Accessed April 24, 2020.
18. Semple S, Cherrie JW. Covid-19: protecting worker health. *Ann Work Expo Health* 2020. <https://doi.org/10.1093/annweh/wxaa033> [Epub ahead of print].
19. Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med* 2012;172: 1377–1385.
20. Shanafelt TD, Hasan O, Dyrbye LN, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc* 2015;90:1600–1613.
21. WHO. International Classification of Disease 11th Revision. Geneva: World Health Organization, 2019.
22. Maslach C, Jackson SE. The measurement of experienced burnout. *J Occup Behav* 1981;2:99–113.
23. Reddy SK, Yennu S, Tanco K, et al. Frequency of burnout among palliative care physicians participating in a continuing medical education course. *J Pain Symptom Manage* 2020. <https://doi.org/10.1016/j.jpainsymman.2020.02.013> [Epub ahead of print].
24. Kamal AH, Bull JH, Wolf SP, et al. Prevalence and predictors of burnout among hospice and palliative care clinicians in the US. *J Pain Symptom Manage* 2019. <https://doi.org/10.1016/j.jpainsymman.2019.11.017> [Epub ahead of print].
25. Maslach C, Leiter MP. The truth about burnout: How organizations cause personal stress and what to do about it. San Francisco: John Wiley & Sons, 2008.
26. Schaufeli WB, Bakker AB, Hoogduin K, Schaap C, Kladler A. On the clinical validity of the Maslach burnout inventory and the burnout measure. *Psychol Health* 2001; 16:565–582.
27. Schutte N, Toppinen S, Kalimo R, Schaufeli W. The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *J Occup Organ Psychol* 2000;73:53–66.
28. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc* 2017;92:129–146.
29. Wang H, Zhang L. Risk of COVID-19 for patients with cancer. *Lancet Oncol* 2020;21:e181.
30. Cortiula F, Pettke A, Bartoletti M, Puglisi F, Helleday T. Managing COVID-19 in the oncology clinic and avoiding the distraction effect. *Ann Oncol* 2020. <https://doi.org/10.1016/j.annonc.2020.03.286> [Epub ahead of print].
31. Lambden JP, Chamberlin P, Kozlov E, et al. Association of perceived futile or potentially inappropriate care with burnout and thoughts of quitting among health-care providers. *Am J Hosp Palliat Care* 2019;36:200–206.
32. Shanafelt TD, Gorringer G, Menaker R, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc* 2015;90:432–440.
33. Asai M, Morita T, Akechi T, et al. Burnout and psychiatric morbidity among physicians engaged in end-of-life care for cancer patients: a cross-sectional nationwide survey in Japan. *Psychooncology* 2007;16:421–428.
34. Oreskovich MR, Kaups KL, Balch CM, et al. Prevalence of alcohol use disorders among American surgeons. *Arch Surg* 2012;147:168–174.

35. Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg* 2010;251:995–1000.
36. Shanafelt TD, Balch CM, Dyrbye L, et al. Special report: suicidal ideation among American surgeons. *Arch Surg* 2011;146:54–62.
37. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. *J Intern Med* 2018;283:516–529.
38. Dewa CS, Loong D, Bonato S, Thanh NX, Jacobs P. How does burnout affect physician productivity? A systematic literature review. *BMC Health Serv Res* 2014;14:325.
39. Kuerer HM, Eberlein TJ, Pollock RE, et al. Career satisfaction, practice patterns and burnout among surgical oncologists: report on the quality of life of members of the Society of Surgical Oncology. *Ann Surg Oncol* 2007;14:3043–3053.
40. Pattison N, Droney J, Gruber P. Burnout: caring for critically ill and end-of-life patients with cancer. *Nurs Crit Care* 2020;25:93–101.
41. Raphael MJ, Fundytus A, Hopman WM, et al. Medical oncology job satisfaction: results of a global survey. *Semin Oncol* 2019;46:73–82.
42. Shanafelt T, Dyrbye L. Oncologist burnout: causes, consequences, and responses. *J Clin Oncol* 2012;30:1235–1241.
43. Weintraub AS, Sarosi A, Goldberg E, Waldman ED. A cross-sectional analysis of compassion fatigue, burnout, and compassion satisfaction in pediatric hematology-oncology physicians in the United States. *J Pediatr Hematol Oncol* 2020;42:e50–e55.