Shastri T, Gawri K, Rodriguez E, Dawar R. Physical and Psychological Impact of the Covid-19 Pandemic on Healthcare Workers, Including End of Life Care Providers. *Health Psychology Research*. 2024;12. doi:10.52965/001c.117641

General

# Physical and Psychological Impact of the Covid-19 Pandemic on Healthcare Workers, Including End of Life Care Providers

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Keywords: burnout, pandemic, palliative care, oncology, healthcare, wellness

https://doi.org/10.52965/001c.117641

Health Psychology Research

Vol. 12, 2024

## Background

The COVID-19 pandemic has not only caused unprecedented distress in the community but has also resulted in significant physical and psychological exhaustion among healthcare workers (HCWs). This exhaustion could potentially lead to serious effects on our healthcare system.

## Objective

The aim of this study was to gain more insight on the effect of COVID-19 on burnout among oncologists and other healthcare professionals at a large academic center.

## Methods

A 10-minute electronic questionnaire was distributed to actively employed physicians, APRNs, and PAs affiliated with the University of Miami. The survey encompassed a range of personal and professional characteristics, including stress related to COVID-19.

## Results

The survey was distributed to a total of 739 HCWs, with 182 respondents (24.6%) completing the entire survey. The impact of the pandemic on these professionals included increased workload (59.5%), reduced leadership opportunities (32.2%), job insecurity (28.6%), and rescheduling of professional activities (22.2%). Out of the 182 respondents, 70 were primarily from the fields of Oncology and Palliative Care.

## Conclusions

Several factors have contributed to increased physical and psychological stress among HCWs, such as extended working hours, sleep deprivation, job insecurity, the shift to telemedicine, the risk of contracting the virus and endangering their families, lack of childcare options, and the added pressure of homeschooling. This study serves as a foundation for more comprehensive research aimed at elucidating and guiding the development of wellness programs crucial for the overall well-being of HCWs.

## INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic, which is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), was first identified in December 2019 and caused one of most massive disruptions to healthcare systems worldwide.[1] It was a particularly challenging time for healthcare workers (HCWs) throughout the world as they were impacted physically, mentally, and socially.[2] The rapid spread of COVID-19 resulted in many preventive measures including health advocacy campaigns, lockdowns, and restriction of public gatherings.[2,3] Clinicians had to rapidly adopt telemedicine to reach patients due to clinic closures.[2] Meanwhile, hospitals ramped up their capabilities to care for high numbers of patients.[2] Combined, these additional stressors heightened the already-existing challenges HCWs face daily and further displayed the limitations of the healthcare system.[2]

Burnout has been defined by Maslach et al. as a "psychological syndrome characterized by emotional exhaustion, depersonalization and a sense of reduced accomplishment in day-to-day work".[4,5] Prior to the pandemic, professional burnout was a known global health concern among HCWs due to high workload, strict organization regulations, insufficient time to cope with occupational challenges, rapidly evolving knowledge base, and a lack of interpersonal support in everyday life.[3] These challenges often lead to the "emotional exhaustion" and "depersonalization" components of burnout, where a person lacks energy to ac-

complish tasks and may cynically treat others as objects, respectively.[3] In a study conducted in "Occupational burnout and job satisfaction among physicians in times of COVID-19 crisis: a convergent parallel mixed-method study", nearly 45.8% US physicians from a cohort of 7288 reported experiencing at least one symptom of burnout even before the pandemic hit.[6] Another survey performed during the pandemic showed that nearly 60% of the participating physicians reported symptoms of burnout.[7]

During the pandemic, HCWs have faced extensive challenges such as high workload, lack of protective devices, fear of infection, and lack of social support amongst other challenges leading to a significant rise in anxiety, insomnia, and depression.[8,9] Studies have also shown an increase prevalence of post-traumatic stress disorder in HCWs.[10-12] This not only affects HCWs' own health but also the quality of care that they provide. In high stakes situations, burnout can potentially lead to devastating mistakes with poor outcomes.[13]

In this study, we focus on understanding the implications of this pandemic on HCWs' rates of burnout and overall well-being. In addition, we aim to better understand the impact of the pandemic on different aspects of daily life. Lastly, we further analyze the level of burnout in HCWs within the Oncology and/or Palliative Care subspecialties and whether significant differences were observed based on a HCW's gender, marital status, and/or race/ethnicity. Studies such as this can provide insight into developing a healthcare system that is prepared for future public health crises, can support HCWs and prevent such high escalation of burnout in this population.

## MATERIALS AND METHODS

After obtaining approval from the Institutional Review Board (IRB) at the University of Miami, a 10-minute electronic self-reported questionnaire was developed and distributed through the RedCap platform. The survey was distributed to 739 actively employed healthcare professionals, including physicians, APRNs, PAs, and RNs, within the University of Miami Hospital system (UMH). Inclusion criteria for study participants comprised being employed by UMH with active practice within the last 6 months, working in either an inpatient or outpatient setting, being proficient in English or Spanish, possessing an active email address, and being 18 years or older. Eligible healthcare workers were identified through the UChart administrative database and were sent email invitations to participate.

The survey items assessed a range of personal sociodemographic and professional characteristics, including stress related to COVID-19, such as exposure risk and workload. Additionally, it evaluated COVID-19-specific psychological distress, encompassing fear, anxiety, grief, and depressive symptoms. Burnout was assessed using the Maslach Burnout Inventory (MBI), which measured severity across two domains: emotional exhaustion and depersonalization. To estimate the associations between study variables and high levels of burnout, we employed a logistic regression model. Odds ratios (ORs) and their corresponding 95% confidence intervals (CIs) were calculated, while continuous variables were evaluated using a two-sample t-test based on high burnout status.

## RESULTS

We conducted a survey among 739 healthcare workers affiliated with the University of Miami, achieving an overall response rate of 24.6%. This resulted in a sample size of 180 respondents. Among these participants, 63.7% were physicians, 8.6% were fellows-in-training, and 27.4% were advanced practice registered nurses or physician's assistants. The respondent pool had a higher representation of females (4.83%) compared to males (39.4%) (table 1). In addition, most respondents were married (128, 71.1%) and had children (114, 63.3%) (table 1).

The survey responses revealed that the pandemic had various effects, including increased workload (59.5%), decreased leadership opportunities (32.2%), job insecurity (28.6%), and rescheduling of professional activities (22.2%). Furthermore, respondents reported challenges such as reduced exercise (62.3%), difficulties in maintaining a work-life balance (61.4%), disrupted childcare arrangements (60.6%), increased home responsibilities (56.1%), and new sleep disorders (44.8%).

A significant portion of the respondents were physicians (119, 66.1%), with many specializing in fields related to end-of-life care, such as hematology/oncology, neurology-oncology, radiation-oncology, or palliative care (totaling 70 out of 180 respondents, or 38.9%). Among these 70 respondents, 9 reported high depersonalization (12.8%), 27 reported high emotional exhaustion (38.5%), and 33 reported experiencing overall high burnout symptoms on either the emotional exhaustion or depersonalization scales (47.1%).

62.5% (95% CI=35.4-84.8) physicians holding positions from PGY4 through licensed attendings with less than 5 years of experience exhibited a high burnout rate (10 out of 16), which was not statistically different from older physicians (40.7% (95% CI=22.4-61.2)). No statistically significant differences in burnout were observed for other study variables, including gender, marital status, and race/ethnicity.

## DISCUSSION

Our research sheds light on the profound physical and psychological impact of the COVID-19 pandemic on healthcare workers, carrying implications for both their personal lives and professional roles. The healthcare workers surveyed in our study provide further validation of our hypothesis that burnout rates escalated during and following the pandemic. Given that most of our respondents were physicians, this survey data provides a rare glimpse into the daily struggles that often lead to burnout. Nearly 60% of respondents reported experiencing an increased workload and a similar number struggle with maintaining a work-life balance. Interestingly, statistically significant differences were not noted depending on levels of experience as a physician, gender, martial status, or race/ethnicity (table 2). This dif-

**Table 1. Number and percentage of respondents for each variable**

| Variable | All | | No | | Yes | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| *All* | 180 | 100.0 | 92 | 100.0 | 88 | 100.0 |
| *Gender* | | | | | | |
| *Female* | 87 | 48.3 | 42 | 45.7 | 45 | 51.1 |
| *Male* | 71 | 39.4 | 43 | 46.7 | 28 | 31.8 |
| *Unknown* | 22 | 12.2 | 7 | 7.6 | 15 | 17.0 |
| *Marital status* | | | | | | |
| *Married* | 128 | 71.1 | 65 | 70.7 | 63 | 71.6 |
| *Not Married* | 47 | 26.1 | 27 | 29.3 | 20 | 22.7 |
| *Unknown* | 5 | 2.8 | * | * | 5 | 5.7 |
| *Children* | | | | | | |
| *No* | 65 | 36.1 | 33 | 35.9 | 32 | 36.4 |
| *Yes* | 114 | 63.3 | 58 | 63.0 | 56 | 63.6 |
| *Unknown* | 1 | 0.6 | 1 | 1.1 | * | * |
| *Covid19 positivity history* | | | | | | |
| *Never/Not confirmed low or high suspicion* | 165 | 91.7 | 82 | 89.1 | 83 | 94.3 |
| *Yes confirmed* | 14 | 7.8 | 10 | 10.9 | 4 | 4.5 |
| *Unknown* | 1 | 0.6 | * | * | 1 | 1.1 |
| *Medical specialty* | | | | | | |
| *HemOnc/neuro-onc/radiation oncology/palliativecare* | 70 | 38.9 | 37 | 40.2 | 33 | 37.5 |
| *Inpatient* | 53 | 29.4 | 27 | 29.3 | 26 | 29.5 |
| *Psychiatry* | 12 | 6.7 | 6 | 6.5 | 6 | 6.8 |
| *Outpatient Other* | 30 | 16.7 | 16 | 17.4 | 14 | 15.9 |
| *Unknown* | 15 | 8.3 | 6 | 6.5 | 9 | 10.2 |
| *Career length* | | | | | | |
| *Attending <5 years* | 35 | 19.4 | 17 | 18.5 | 18 | 20.5 |
| *Attending 6-20 years* | 69 | 38.3 | 34 | 37.0 | 35 | 39.8 |
| *Physician Assistant/Nurse practitioner <5 years* | 20 | 11.1 | 11 | 12.0 | 9 | 10.2 |
| *Physician Assistant/Nurse practitioner 6 or more years* | 29 | 16.1 | 18 | 19.6 | 11 | 12.5 |
| *PGY4 or above* | 15 | 8.3 | 9 | 9.8 | 6 | 6.8 |
| *Other (residentnurse, unknown)* | 1 | 0.6 | * | * | 1 | 1.1 |
| *Unknown* | 11 | 6.1 | 3 | 3.3 | 8 | 9.1 |
| *Race* | | | | | | |
| *White* | 82 | 45.6 | 49 | 53.3 | 33 | 37.5 |
| *Black* | 13 | 7.2 | 6 | 6.5 | 7 | 8.0 |
| *Other* | 33 | 18.3 | 13 | 14.1 | 20 | 22.7 |
| *Unknown* | 52 | 28.9 | 24 | 26.1 | 28 | 31.8 |
| *Ethnicity* | | | | | | |
| *Hispanic* | 69 | 38.3 | 36 | 39.1 | 33 | 37.5 |
| *Non-Hispanic* | 111 | 61.7 | 56 | 60.9 | 55 | 62.5 |
| *race4cat* | | | | | | |
| *Non-Hispanic White* | 59 | 32.8 | 36 | 39.1 | 23 | 26.1 |
| *Non-Hispanic Black* | 13 | 7.2 | 6 | 6.5 | 7 | 8.0 |
| *Hispanic* | 69 | 38.3 | 36 | 39.1 | 33 | 37.5 |
| *Other* | 31 | 17.2 | 12 | 13.0 | 19 | 21.6 |
| *Unknown* | 8 | 4.4 | 2 | 2.2 | 6 | 6.8 |

**Table 2. Title: Univariable analysis of the survey data**

| | | OR | 95%CI | p-value |
|---|---|---|---|---|
| Gender | Female | ref | - | - |
| | Male | 0.61 | (0.32, 1.15) | 0.608 |
| Marital Status | Married | ref | - | - |
| | Not Married | 0.76 | (0.39, 1.5) | 0.764 |
| Children | No | ref | - | - |
| | Yes | 1.0 | (0.54, 1.93) | 0.996 |
| COVID19 | Never, Not confirmed | ref | - | - |
| | Yes Confirmed | 0.4 | (0.12, 1.31) | 0.395 |
| Specialty | *HemOnc/neuro-onc/radiation oncology/palliativecare* | ref | - | - |
| | *Inpatient* | 1.08 | (0.53. 2.21) | 0.833 |
| | *Psychiatry* | 1.12 | (0.33, 1.12) | 0.855 |
| | *Outpatient Other* | 0.98 | (0.42, 2.31) | 0.965 |
| Career | *Attending <5 years* | ref | - | - |
| | *Attending 6-20 years* | 0.97 | (0.43, 2.19) | 0.946 |
| | *Physician Assistant/Nurse practitioner <5 years* | 0.77 | (0.26, 2.33) | 0.647 |
| | *Physician Assistant/Nurse practitioner 6 or more years* | 0.58 | (0.21, 1.57) | 0.282 |
| | *PGY4 or above* | 0.63 | (0.19, 2.15) | 0.460 |
| | *Other (residentnurse, unknown)* | NE | - | - |
| Race/ethnicity | *Non-Hispanic White* | ref | - | - |
| | *Non-Hispanic Black* | 1.83 | (0.55, 6.12) | 0.329 |
| | *Hispanic* | 1.44 | (0.71, 2.9) | 0.316 |
| | *Other* | 2.48 | (1.02, 6.05) | 0.046 |
| | *Unknown* | 4.7 | (0.87, 25.3) | 0.072 |

fers from a prior study studying stress and burnout among US healthcare workers during the COVID-19 pandemic which found statistical differences within race and gender variables.[14] However, the highest rates of burnout were seen in people who did not indicate their race or gender.[14]

While many aspects of life were impacted by the COVID-19 pandemic, HCWs at our academic center reported the most difficulty with exercise, maintaining a work-life balance, and arranging childcare. These aspects of daily life were mostly impacted by the increased workload that our physicians faced during the COVID-19 pandemic, while also experiencing a sense of employment insecurity and decreased opportunities for leadership. 38.9% of the survey responders were HCWs specializing in end-of-life care, such as hematology/oncology, neurology-oncology, radiation-oncology, or palliative care reported high emotional exhaustion and overall high burnout symptoms. Repeated exposure to death and dying, complicated symptom management, difficulties in communication with patients and families, and inadequate coping with one's own emotional response to loss of patients are experienced by end-of-life care physicians on a regular basis and are risk factors for the development of burnout.[14-16] The high rate of death during the COVID-19 pandemic most likely exacerbated these risk factors, leading to a high rate of burnout syndrome among end-of-life providers.

Efforts should be made to target these aspects and curb the effect of burnout on our frontline/healthcare workers. In previous studies, burnout has been identified as a primary cause for the increasing prevalence of substance abuse, depression, and suicide in health care workers, especially physicians.[17,18] Burnout has also been shown to increase medical errors (a leading cause of mortality in the US) and decrease the quality of care provided, further impacting our fragile healthcare system.[19] Several potential strategies to alleviate burnout include subsidizing or offering childcare services for healthcare workers in dual-income or single-parent households, providing gym membership subsidies or access to nearby/onsite athletic facilities, and, lastly, offering work-related incentives, whether financial or otherwise, to employees who have increased their working hours to meet the demands of the pandemic-stricken healthcare system.

The study has several limitations that should be acknowledged. Firstly, it was exclusively conducted within a single institution, which implies that the findings may not be readily applicable to broader geographical areas or different countries. Secondly, the omission of age as a variable is notable, as it could have wielded a significant influence on the results. Additionally, we did not assess the baseline level of burnout before the onset of the pandemic, which is an important aspect for a comprehensive understanding

of the subject. The study's cross-sectional design restricts our ability to observe changes in burnout over time, necessitating a longitudinal study for a more in-depth analysis of the pandemic's long-term impact. Furthermore, it's worth noting that most of our respondents were either married or had children. Given the distinctive challenges faced by this demographic compared to individuals who are single or childless, it may be valuable to investigate the variations in burnout rates between these subgroups in future research.

## CONCLUSION

The extended work hours, sleep deprivation, job insecurity, shift to telemedicine, and the added pressure of homeschooling have collectively escalated the physical and psychological strain experienced by healthcare workers. Furthermore, the COVID-19 pandemic may have intensified risk factors for burnout among end-of-life care providers, as they reported increased emotional exhaustion and overall burnout symptoms during this period. These factors underscore the need for a thorough investigation into potential coping strategies. This study lays the foundation for more comprehensive research that can elucidate and guide the development of essential wellness programs aimed at safeguarding the well-being of healthcare workers.

ACKNOWLEDGEMENTS{#ACK}

The authors would like to thank their respective institutes.

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The authors confirm contribution to the paper as follows: study conception and design; Kunal Gawri, MD, Estelamari Rodriguez, MD, MPH, Richa Dawar, MD; analysis and interpretation of results: Toral Shastri, DO, Kunal Gawri, MD, Estelamari Rodriguez, MD, MPH, Richa Dawar, MD; draft manuscript preparation: Toral Shastri, DO. All authors reviewed the results and approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors report no conflicts of interest.

Submitted: April 14, 2024 EST, Accepted: April 17, 2024 EST

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