ORIGINAL ARTICLE

IMPLEMENTATION OF NATIONAL INSTITUTE OF HEALTH GUIDELINES AND OTHER FACTORS CONTRIBUTING TO WORK-RELATED BURNOUT IN COVID ISOLATION WARD AND ICU PHYSICIANS

Mulazim Hussain[1], Muhammad Bin Amjad[2], Juniad Ahsan[2], Shayan Omer Minhas[2]

[1]Infectious Disease Unit, Children Hospital PIMS Islamabad, [2]Islamabad Medical and Dental College, Islamabad-Pakistan

Background: During the pandemic, disruption of work schedule and constant health risks causes physician burnout. This study aims to identify Burnout in physicians working in COVID ICU and isolation Ward. **Methods:** A cross-sectional study was conducted on 200 physicians who had worked in either COVID ICU or Isolation ward. A survey of 23 questions was designed to assess the work-related Burnout using the Copenhagen burnout inventory and the implementation of NIH guidelines. **Result:** Among the 200 physicians, 151 (75.5%) were well informed of the guidelines, of which 52 (34.4%) participants believed the guidelines were not sufficient. These 34.4% of individuals showed a mean burnout score of 70.05% (*p*-value 0.001). Medical registrars and Medical Officers suffered the highest burnout mean percentage score of 76% and 72.42%, respectively. 89 (44.5%) individuals arranged PPE suits on their own and suffered a burnout score of 71.3% ±14.35 (*p*-value <0.001). Seventy-two (36%) claimed their administration was not cooperative in resolve safety issues. These individuals showed a mean burnout score of 74.3% ±13.82 (*p*-value <0.001). **Conclusion:** Lack of physician's faith in the adequacy of the NIH guidelines has been found to be a significant factor in contributing to work-related Burnout. Due to the shortage of PPE, a majority of physicians have to reuse their PPE multiple times and even have to personally arrange their PPE suits, which further compounds the burnout. Increase administrative cooperation in resolving issues related to safety measures should help elevate work-related burnout in physicians working in the ICU and isolation ward.

Keywords: COVID-19; Pandemic; Health Planning guidelines; Physicians; Burnout; National Institute of Health

Citation: Hussain M, Amjad MB, Ahsan J, Minhas SO. Implementation of National Institute of Health guidelines and Other Factors Contributing to Work-related Burnout in COVID isolation ward and ICU physicians. J Ayub Med Coll Abbottabad 2021;33(2):283–8.

INTRODUCTION

On March 11 2020, the world faced a pandemic, the first of its kind by a Coronavirus, which causes pneumonia and is highly infectious.[1] The virus was labelled by the International Committee for Taxonomy of viruses as "Syndrome Coronavirus 2 (SARS-CoV-2)".[2] Having a spectrum of conditions associated with it, pneumonia and acute respiratory distress syndrome were very common among infected individuals.[3,4] Initial studies estimated the R_0 of the virus to be 2.68 with a doubling time of 6.4 days.[5,6] These findings predicted the scale of the burden and load the health care system around the world was going to face. The number of cases globally grew from 100,000 to 6,000,000 between March and May. Pakistan faced a similar problem as COVID-19 numbers grew from 5 to 80,000.[7] Pakistan's government took strict precautionary measures since March and controlled the rise in cases as compared to other countries. With the readiness of the government and the prompt availability and guidance from the WHO, protocol and notifications were distributed to all hospitals regarding an emerging epidemic. As hospitals began to saturate with SARS-CoV-2 patients, certain guidelines were placed at the hospitals as advised by the National Institute of Health (NIH) to ensure that the Health Care workers (HCW) had a safe environment and operational measure while working.[8] Certain hospitals were made the SARS-CoV-2 centers to test and accept the cases and provide isolation wards and Intensive care units (ICU).

A large number of HCW in Wuhan- China, had been infected because of their lack of knowledge regarding the severity of the disease.[9] With minimal knowledge regarding the epidemic in Pakistan, physicians faced a high risk of infection while working in Outpatient departments and inpatient departments. Critical reasons such as long-time exposure, work intensity, long working hours, lack of rest, and an extreme shortage of Personal protective equipment globally were the primary cause of infection in physicians and other HCWs.[10–12] This is an alarming circumstance as in lower-middle-income countries such as Bangladesh, 65.7% of doctors have stated a preference for avoiding working with COVID-19

patients.[13] Thus, a shortage of doctors in the case of a pandemic can have a detrimental effect on the health care system.

"Burnout is a state of physical, emotional, and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding".[14] With the complete disruption to the work schedule, the Physician's worries are not limited to SARs-CoV-2 exposure but of availability of PPE, family support, overwork load, expectations to performance above capacity.[15] This, along with an increase in patient load and the fear of infection, causes stress and workload on doctors. Lack of input or control towards physicians with respect to issues affecting their work lives, organizational support structures cause burnout.[16]

It is widely understood that change in workload leads to episodes of burnout in physicians, with patients and attendants counselling, social taboos, and being careful of pathological dangers induces psychological distress.[17] This, in turn, compromises the doctor's ability to provide optimal care to the patients[16], but there is little data regarding the correlation of available resources during a pandemic and physician burnout.

As such, this study aims to identify the correlation of burnout in physicians working in isolation wards and ICUs with the strict guidelines by the NIH during the pandemic in multiple hospitals of Pakistan. In addition, it sheds light on the availability and accesses to resources essential for physicians working in a SARS-CoV-2 isolation ward/ ICU.

MATERIAL AND METHODS

A cross-sectional study was conducted on 275 Physicians from 7th of July to 28th of August, 2020. Questionnaires were distributed in government and private health institutes having an active COVID isolation ward and ICU facility. Consent was acquired from the participants, and anonymity was assured. A pilot study of 82 doctors indicated 14.5% had worked in the COVID isolation ward or ICU, a minimum sample size of 191 was then extrapolated using the WHO sample size calculator with a confidence interval (CI) of 95%. A non-probability sampling method was applied with snowball sampling. The survey was distributed physically to the physicians who had worked in the COVID isolation ward or ICU. Due to limited physical access, surveys were sent via an online Google form. Physicians who worked in an ICU/Isolation ward prior to the study were solely included in the study.

A 23 questions survey regarding work-related Burnout and the implementation of COVID-19 NIH guidelines is designed. The work-related burnout questions were adapted from the Copenhagen Burnout Inventory[14], which was used in other similar studies on assessing burnout during COVID among health care workers[18].

Analyses using the SPSS version 21, independent and dependent variables were presented as a percentage. Burnout was expressed as a Mean percentage score with standard deviations and validated by the student's T-test. Categorical variables were correlated using ANOVA and Chi-square tests. The *p*-value of <0.05 was considered statistically significant.

Surveys were collected by Data collectors, which were supervised by the authors. SPSS version 21 was analysing software.

RESULTS

A total of 275 surveys were filled. According to the inclusion criteria 200 were selected.

Among the 200, 106 (53%) participants were male, while 94 (47%) were female. Regarding NIH guidelines, 151 (75.5%) reported having been well informed by the hospital, while 49(24.5%) claimed to have not. Staff meetings 26.89% (64 out of 238), Webinars 21.42% (51 out of 238), and Board notices 21.42% (51 out of 238) were used to educate the staff. Regarding the adequacy of the guidelines towards personal safety, 115 (57.5%) believed them to be sufficient, whereas 85 (42.5%) believed they were insufficient. Eighty-nine (44.5%) of individuals had to arrange their own PPE suits. With concerns about the safety issues, 72 (36%) participants claimed that the hospital administration showed a lack of cooperation in solving the problems.

Further analytical tests were conducted to visualize the correlation between multiple factors stated in Table 1 with Work-related Burnout. Correlation of Gender with Burnout was insignificant (*p*-value of 0.300). The Medical Registrar and Medical Officers showed high Mean burnout scores of 76±10 and 72.42±16.2, respectively.

The generalized correlation of burnout with the belief that guidelines being sufficient was particularly significant (*p*-value <0.001). Data of 151 participants claiming of being well informed with the guidelines showed a mean burnout score of 70.05±14.56 of 34.43% individuals calling the policies not sufficient. In contrast, a mean burnout score of 61.24±15.79 was observed in individuals accepting the guidelines as sufficient. Burnout in individuals stating lack of cooperation and the purchasing of PPEs was significant (*p*-value <0.001). (Ttable 2)

Table-3 presents the correlation of frequencies of hospital provided PPE suits with PPE reuse while Table 4 cites the incidences of Masks and Goggles/shield provided individually. Both correlations demonstrated exceptional significance (*p*-value <0.001) through the Chi-square test

Table-1: Factors effecting burnout

Variable	Option	N	percentage
Gender			
	Male	106	53
	Female	94	47
Have you been Well informed of Guidelines	Yes	151	75.5
	No	49	24.5
Do you believe the guidelines are sufficient?	Yes	115	57.5
	No	85	42.5
Type of Mask Provided	N95/KN95	116	58
	surgical	75	37.5
	No	9	4.5
Arrange PPE suit on your own	Yes	89	44.5
	No	111	55.5
Hand sanitizers regularly provided	Yes	144	72
	Occasionally	51	25.5
	No	5	2.5
Administration cooperative	Yes	128	64
	No	72	36

Table-2: Mean Burnout score (%) correlated with multiple variables

Gender with Burnout	N	Mean Burnout Score (%)	Std. Deviation	T-Test (sig. 2 tailed)
Male	106	67.6819	15.24335	0.300
Female	94	65.3191	16.89842	0.303
Work Designation with Burnout				ANOVA
House Officer	63	66.0317	14.28674	0.000
PG Resident	67	66.5245	16.03032	
Registrar	5	76.0000	10.02039	
Medical Officer	43	72.4252	16.20908	
Consultant	22	54.6753	15.63171	
Total	200	66.5714	16.04526	
(Guidelines sufficient for the protection do you follow) with Burnout				**T-Test (sig. 2 tailed)**
Yes Sufficient + Yes (I follow)	115	62.1366	15.67136	0.000
No (Not Sufficient) + Yes (I follow)	85	72.5714	14.60327	
Guidelines sufficient for the protection do you follow) selective population with Burnout				
Yes Sufficient + Yes (I follow)	99	61.2410	15.79841	0.001
No (Not Sufficient) + Yes (I follow)	52	70.0549	14.56303	
Reuse of a PPE suit with Burnout				**ANOVA**
1 time	101	65.3748	16.70042	0.287
2-3 times	30	67.5238	13.53669	
More than 4 times	21	72.6531	13.62984	
Never	48	65.8333	16.84605	
Total	200	66.5714	16.04526	
Arrange PPE on your own with Burnout				**T-Test (sig. 2 tailed)**
Yes	89	71.3323	14.35341	0.000
No	111	62.7542	16.36743	
Hospital administration cooperation with Burnout				
Yes	128	62.1875	15.58123	0.000
No	72	74.3651	13.82328	

Table-3: Correlation of hospital provided PPE suits with PPE reuse

		How often does the hospital provide you with PPEs suits?					Total	Chi-Square Tests Asymp. Sig. (2-sided)
		Daily	Once a shift	Once a week	Whenever required	Never		
How often do you reuse your PPE?	1 time	28	24	5	42	2	101	.000
	2-3 times	4	8	8	7	3	30	
	Never	20	7	0	19	2	48	
	>4 times	1	0	13	4	3	21	
Total		53	39	26	72	10	200	

Table-4: Correlation of frequencies of mask with face shield or Goggles

		Mask Provided to you?				Total	Chi-Square Tests Asymp. Sig. (2-sided)
		Daily	Once a shift	When required	Never		
Doses your hospital equip you with face shields/goggles and how often?	Yes - Daily	40	9	22	0	71	.000
	Yes - When required	14	25	52	4	95	
	No	7	10	12	3	32	
	4.0	1	1	0	0	2	
Total		62	45	86	7	200	

DISCUSSION

According to the studies, the COVID-19 pandemic has a proven toll on the mental health of the health care workers, especially those who are treating COVID-19 patients.[19,20] This study has further reinforced the point that there is indeed an increase in work-related burnout among physicians in lower-middle-income countries. Based on our investigation, the highest burnout score is reported (Table-2) in the Medical registrar (76%) and Medical Officers (72.42%) with the lowest in Consultants (54.67%). This information helps hospital management assess areas requiring more resources which in turn can produce optimum performance.

A recent study suggesting surgical residents (postgraduates) has shown decreased burnout (66.52%) during COVID-19, which is complemented by our findings.[21]

The study further inspects the physician's level of faith and confidence in the sufficiency of the protective measures put forth as guidelines by the NIH. A staggering 42.5% reported them as insufficient for their protection and safety. These numbers can vary in different regions, such as a study in the UK projected hospital trainee's expressing confidence in the guidelines.[22] In our study, 151 physicians were well informed, of which 34.4% claimed that the guidelines were insufficient for protection as such suffered a mean burnout score of 70.05% as compared to 61.24% burnout of the remaining 65.65% physician who believes the guidelines were sufficient (*p*-value 0.001, Table 2).

The shortage of PPE has already been reported in multiple studies as a primary cause of infection.[11,12] This study further delves into this issue by investigating two main variables, 1) the frequency of hospital providing PPEs and 2) the Reuse of PPE by physicians.

Regarding hospitals providing PPE suits, 19.5% of physicians received once a shift, and a shocking 13% reported once a week. This signifies the shortage of PPE but also highlights the working conditions of Physicians in an ICU and Isolation ward.

Assessing the Reuse of PPE, 15% reported reusing PPE 2-3 times, and 10.5% reporting using it more than four-time. Correlating the frequency of hospital providing PPE and the frequency of reuse, physicians claiming to reuse a PPE 2-3 times showed 20.5% of those who received it once a shift contrasting with 9.72% of those receiving it whenever they required. These findings confirm that there is indeed a shortage of PPE in ICU and isolation wards, which may explain why a staggering 44.5% of physicians complain of arranging their PPE while working in the ICU/Isolation ward. Mental stress and burnout under such conditions is inevitable. Physicians arranging their own PPE's had a statistically significant 71.33% burnout score compared to 62.75% in those who did not have to arrange their own PPEs. Remarkably enough reuse of PPE showed no correlation with burnout and was insignificant (*p*-value 0.287). These findings establish that arrange of PPE by the physicians has a more devastating impact on their work then having to reuse the PPE suits. It is not purposed that reuse of PPE suits should be considered as it negates the guidelines and patient safety therefore alterative measures should be taken to conserve resource such as cancelling outpatient procedure and non-emergency procedures to ensure ICU and Isolation wards are adequately equipped.[23]

Suits are part of the PPE, but masks and goggles/ face shield also play a vital role in protecting individuals from infection. And as a standard practice with respect to the guidelines, every individual should receive a face shield with the mask. The correlation (*p*-value <0.001) in table-4 shows a rather peculiar find. 86 physicians were provided with a mask "whenever required," of which 52 are provided a face shield on requirement as well. Rather than mask and shields set at their disposal, physicians were expected to request a new set/ individual item. From those who were provided a mask "once a shift," 10 (22.22%) participants were not equipped with a face shield, while 12 (13.95%) participants in the "when required" situation was not provided a face shield/goggle. Studies during the 2003 and influenza pandemic in 2009 suggested contact time of physicians with isolated patients was significantly lower as compared to non-isolated patients.[24,25] Thus it signifies the need to provide extensive amount of PPE to ICU which could result in an increase in the contact and interaction time between patients and physicians.

Similarly, to a PPE suit, face shield/goggle assures complete protection. And as such, it has been set as a compulsory part of a PPE set. With work efficiency playing a critical role in the ICU and isolation ward, these scarcities of PPEs compromises patient safety, costs time, energy, and mental energy of physician.

This stresses the need to ensure the availability of the complete PPE protocol ICU and isolation wards to keep physicians from harm's way.

Another factor this study tested was the physician's perception regarding the cooperation of the hospital administration in the resolution of issues related to protective measures. 36% of physicians

complained about a lack of cooperation. Up till now, no literature has addressed a correlation between Physician burnout and administrative cooperation regarding PPE measure. Our study produced an astounding observation, 36% of physicians claimed their administration being non cooperative suffered 74.36% burnout where as 64% whose administration was cooperative suffered 62.18% burnout which is highly significant. Isolation wards and ICU are saturating during a pandemic and physicians working overtime and under marginal conditions. Support and cooperation of the institute's administration can remarkably reduce the level of burnout faced by frontline line Physicians.

The empirical results reported within should be considered in light of 2 major limitations. The first being the relatively small sample size with moderate to low response rate. Therefore, the conclusions may not accurately represent the overall physician community. The second being this study lacked a comparison group of physicians from the pre-COVID 19 eras to compare the mean work-related burnout score. Improvements to the study design may be made by acquiring a larger sample size and additionally acquiring data on physician work-related burnout from the pre-COVID era.

CONCLUSION

It is now well established that healthcare systems in the lower-middle-income countries cannot tackle epidemics with complete and effective physician safety. For HCWs to follow proper guidelines, they need to believe the guidelines are sufficient. Revision of guidelines should be based on physicians, and HCWs critical feedback, as this mere belief is significantly linked to burnout. It is confirmed that there is a global shortage of PPE, which in turn causes physicians to reuse of which poses a threat to health care practices and patient care. Such incidences of reuse have forced physicians to arrange their supply of PPE, which further aggravated their burnout states. Therefore, PPE reuse must be investigated in detail, and measures should be placed to ensure unused PPE's are worn in the ICU and Isolation wards if not in outpatient departments. Physician burnout in lower-middle-income countries is becoming an emerging issue that needs to be tackled. We propose a supportive and cooperative administration is a vital step in alleviating Burnout and safety issues, especially for the high-risk physicians (Medical officers and Registers).

Acknowledgment:
Data collectors: Zain Ul Abideen and Raja Zulqarnain
Biostatistician: Muhammad Afzal

AUTHORS' CONTRIBUTION

MH: Design, revision, final approval of the paper. MBA: Conception, Manuscript writing, revision, final approval. JA: Conception, manuscript writing, revision, final approval. SOM: Acquisition, collection, and analysis of the data, revision, final approval,

REFERENCES

1. Yin Y, Wunderink RG. MERS, SARS and other coronaviruses as causes of pneumonia. Respirology 2018;23(2):130–7.
2. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation and Treatment Coronavirus (COVID-19) [Internet]. StatPearls. StatPearls Publishing; 2020 [cited 2020 Jul 26]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32150360
3. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, *et al*. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020;395(10223):497–506.
4. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, *et al*. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. Lancet Respir Med 2020;8(4):420–2.
5. Wu JT, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. Lancet 2020;395(10225):689–97.
6. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, *et al*. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia N Engl J Med 2020;382(13):1199–207.
7. Pakistan Coronavirus: 271,887 Cases and 5,787 Deaths - Worldometer [Internet]. [cited 2020 July 26]. Available from: https://www.worldometers.info/coronavirus/country/pakistan/
8. covid.gov.pk [Internet]. [cited 2020 July 26]. Available from: http://covid.gov.pk/new_guidelines/01June2020_20200509-Guidance_on_selection_and_use_of_PPE.pdf
9. Xiang YT, Jin Y, Wang Y, Zhang Q, Zhang L, Cheung T. Tribute to health workers in China: A group of respectable population during the outbreak of the COVID-19. Int J Biol Sci 2020;16(10):1739–40.
10. Wang J, Zhou M, Liu F. Reasons for healthcare workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China. 2020;105(1):100–1.
11. Ran L, Chen X, Wang Y, Wu W, Zhang L, Tan X. Risk Factors of Healthcare Workers with Corona Virus Disease 2019: A Retrospective Cohort Study in a Designated Hospital of Wuhan in China. Clin Infect Dis 2020;71(16):2218–21.
12. Bauchner H, Fontanarosa PB, Livingston EH. Conserving supply of personal protective equipment - A call for ideas. JAMA 2020;323(19):1911.
13. Mumu SB, Aktar MN, Nahar Z, Sharmin S, Mostaid MS. Medical Doctors Awareness, Perception, and Attitude towards COVID-19 in Bangladesh: A Cross sectional study [Internet]. Public and Global Health; 2020 May [cited 2020 Sep 4]. Available from: http://medrxiv.org/lookup/doi/10.1101/2020.05.14.20101659
14. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work Stress 2005;19(3):192–207.
15. Ayanian JZ. Mental Health Needs of Health Care Workers Providing Frontline COVID-19 Care. JAMA Health Forum 2020;1(4):e200397.
16. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. J Intern Med 2018;283(6):516–29.

17. Galbraith N, Boyda D, McFeeters D, Hassan T. The mental health of doctors during the COVID-19 pandemic. BJPsych Bull 2020;1–4.
18. Talaee N, Varahram M, Jamaati H, Salimi A, Attarchi M, Kazempour dizaji M, *et al*. Stress and burnout in health care workers during COVID-19 pandemic: validation of a questionnaire. J Public Heal 2020;6:1–6.
19. Kannampallil TG, Goss CW, Evanoff BA, Strickland JR, McAlister RP, Duncan J. Exposure to COVID-19 patients increases physician trainee stress and burnout. Murakami M, editor. PLoS One 2020;15(8):e0237301.
20. Barello S, Palamenghi L, Graffigna G. Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. Psychiatry Res 2020;290:113129.
21. Osama M, Zaheer F, Saeed H, Anees K, Jawed Q, Syed SH, *et al*. Impact of COVID-19 on surgical residency programs in Pakistan; A residents' perspective. Do programs need formal restructuring to adjust with the "new normal"? A cross-sectional survey study. Int J Surg 2020;79:252–6.
22. Aziminia N, Khani A, Smith C, Bakhai A, Lisk C. Hospital Trainees' Worries, Perceived Sufficiency of Information and Reported Psychological Health During The COVID-19 Pandemic [Internet]. Health Systems and Quality Improvement; 2020 Jul [cited 2020 Sep 4]. Available from: http://medrxiv.org/lookup/doi/10.1101/2020.07.22.20158311
23. Bhattacharya S, Hossain MM, Singh A. Addressing the shortage of personal protective equipment during the COVID-19 pandemic in India-A public health perspective. AIMS Public Health 2020;7(2):223–7.
24. Evans HL, Shaffer MM, Hughes MG, Smith RL, Chong TW, Raymond DP, *et al*. Contact isolation in surgical patients: A barrier to care? Surgery 2003;134(2):180–8.
25. Saint S, Higgins LA, Nallamothu BK, Chenoweth C. Do physicians examine patients in contact isolation less frequently? A brief report. Am J Infect Control 2003;31(6):354–6.

Submitted: November 20, 2020	*Revised: December 8, 2020*	*Accepted: December 13, 2020*

Address for Correspondence:

Mulazim Hussain, Infectious Disease Unit, Children Hospital PIMS Islamabad-Pakistan
Cell: +92 333 8902433
Email: dr_hussain2008@yahoo.com