

## Original paper

# Prevalence and associated factors of burnout among doctors working in hospitals with COVID-19 treatment units in Anuradhapura district, Sri Lanka during COVID-19 pandemic: a descriptive cross-sectional study

G U Rambukwella, D Ediriweera, A Isuru

## Abstract

### Background

COVID-19 pandemic has caused enormous burden on the already compromised health system, particularly in remote areas of country. Evaluation of the rate of burnout among doctors working in COVID-19 units is important for planning interventions.

### Aims

To estimate the prevalence and associated factors of burnout among doctors working in hospitals with COVID-19 treatment units in Anuradhapura district.

### Methods

A cross-sectional descriptive study was conducted among doctors working in hospitals with COVID-19 treatment units in Anuradhapura district of Sri Lanka during third wave of the pandemic. Calculated sample size was 383. Self-administered data collection form designed as an online and printed forms. Burnout was assessed using Professional Fulfilment Index. Prevalence rates and associated factors for burnout were evaluated, and the binary logistic regression method was used to identify the risk factors of burnout.

## Results

Prevalence of burnout was 41.6% (95%CI: 36.6-46.7). Binary logistic regression analysis showed lack of professional fulfilment (OR=2.79, 95%CI: 1.69-4.65,  $p=0.0001$ ), excessive workload (OR=3.87, 95%CI: 2.30-6.62,  $p=0.0000$ ), lack of psychological support from services (OR=1.86, 95%CI: 1.07-3.30,  $p=0.0300$ ), lack of psychological support from family (OR=1.95, 95%CI: 1.14-3.37,  $p=0.0159$ ), being an intern house officer (OR=4.06, 95%CI: 1.27-13.45,  $p=0.0193$ ), and less number of years of work experience (OR=3.52, 95%CI: 1.54-8.62,  $p=0.0040$ ) as risk factors for developing burnout in this study population.

## Conclusions

The prevalence of burnout was high among doctors working in hospitals with COVID-19 units in rural Sri Lanka. Addressing this important issue is vital to improve the quality of life of doctors and the services they rendered during any crisis situations such as COVID-19 pandemic.

**SL J Psychiatry 2023; 14(2): 23-30**

## Introduction

The novel coronavirus (SARS-CoV-2) infection broke out in Wuhan city, China in the end of December 2019. The infection causes a severe acute respiratory disease known as coronavirus disease-2019 (COVID-19). Currently there are more than 700 million cases and nearly 7 million deaths reported globally (1). Sri Lanka identified first case in late January 2020 and has reported 672,598 confirmed cases of COVID-19 with 16,833 deaths up to date (1).

COVID-19 pandemic has caused enormous psychological burden on people infected and their families, healthcare workers and general public worldwide (2). The rapid escalation of infection created immense challenge for healthcare systems worldwide and forced healthcare workers to face many clinical and nonclinical challenges. Consequently, evidence across the globe indicates that burnout, anxiety, depression, and stress related disorders are on the rise among healthcare professionals (2,3,4). Therefore, it is important to understand the prevalence

of psychological burnout amongst healthcare professionals. Research evidence on the prevalence burnout is lacking in Sri Lanka during the period of COVID-19 pandemic. A good understanding of the prevalence and associated factors of psychological issues amongst healthcare professionals will be useful for planning services to improve the psychological wellbeing of healthcare professionals. This will in turn assist healthcare professionals to deliver a better patient care.

Sri Lanka set a good example to maintain optimum health indices using minimum resources (5). However, Sri Lankan healthcare system is maintained by suboptimal numbers of doctors per population which is 1.2 per 1000 population (6).

Burnout described as a multidimensional response to job stress. It can be defined as a psychological condition characterized with exhaustion, cynicism, and inefficacy at ones occupation (7). Emerging evidence shows that clinicians at higher risk of developing burnout particularly for those exposed to higher rates of trauma or death (8). It is also associated with perception that they are not delivering sufficient care (8,9). In addition to its negative effects on the physician, burnout has a detrimental effect on patient safety and quality of care (9). It was shown that the prevalence of physician burnout was higher in Sri Lanka, even before the pandemic (10).

COVID-19 pandemic incurred a devastating impact on developed countries even with optimum numbers of doctors and intensive care beds per 100000 population (11). Healthcare workers in developed countries experienced high rates of burnout and psychological morbidities during the pandemic (12,13,14,15,16). The additional burden and other stressors bring on with the pandemic situation probably have further strained the already compromised health system of Sri Lanka. Therefore, it is particularly important to evaluate the mental health issues and associated factors in the doctors working in peripheries with minimal facilities.

Published research evidence is not adequate to understand the nature and extend of mental health issues among doctors during COVID-19 pandemic. Furthermore, the available studies are carried out in urban and semi-urban areas closer to capital city Colombo, Sri Lanka. The result of this study is useful in planning interventions to address mental burnout among doctors working in peripheral hospitals in Sri Lanka during COVID-19 pandemic and these findings may be useful in future crisis situations. Therefore, this study aims to evaluate the prevalence and associated factors of burnout in doctors working in COVID-19 treatment units in Anuradhapura district.

## **Methodology**

### **Study design and setting**

This is a cross-sectional descriptive study which is conducted between August 2021 to November 2021 during the third wave of COVID-19 pandemic in Sri Lanka. The sample was selected from the hospitals with COVID-19 treatment units in Anuradhapura district of Sri Lanka. Following hospitals were included in the study; Teaching Hospital, Anuradhapura, Base Hospital, Kebithigollawa, Base Hospital, Thambuththegama, Divisional Hospital, Nochciyagama, Divisional Hospital, Galenbindunuwewa, Divisional Hospital, Thammannawa, Divisional Hospital, Galkiriyagama, Divisional Hospital, Thanthirimale, Intermediate Care Unit, Wahamalagollawa.

### **Study population**

The doctors working in above hospitals was the population of this study. There were 587 doctors working in those institutes during the study period. Anuradhapura Teaching Hospital had 505 doctors and Base Hospital, Thambuththegama had 58 doctors. The rest were from other hospitals.

### **Study sample**

A recently published study found that burnout rates among healthcare professionals, measured using the same instrument to be used in this study, Professional Fulfilment Index (PFI) was 29.5% (15). A study done in Sri Lankan sample before the COVID-19 pandemic found that physician burnout was 31.5% (10). From these proportions sample size (n) is calculated as 383. Therefore, in this study, the minimum required sample size is determined as 383 considering the highest sample size from the above calculations.

The rate of non-responders expected to be high in this population. In addition, significant proportion of doctors expected to be excluded when allowed for exclusion criteria eg. quarantined doctors, doctors who are on in-ward treatment for COVID-19 or other medical conditions, pregnant doctors, doctors on maternity leave, doctors who have taken leave on medical grounds and doctors who have taken other leaves during the study period and 2 weeks prior of data collection. Therefore, we assumed, approximately 100 to 150 doctors will not be able to participate this study leaving the study population of 384 to 434. Therefore, we did not adopt any sampling method and the entire population recruited for the study as the population size is approximate to the required minimal sample size, i.e. 383. On other hand, excess respondents than minimal sample size increase the confidence in estimates with greater precision.

Doctors working in COVID-19 treating hospitals in Anuradhapura district were included in the study. The

doctors who were on leave during and two weeks prior to study period, eg. quarantined doctors, doctors who are on in-ward treatment for COVID or other medical condition, pregnant doctors, doctors on maternity leave, doctors who have taken leave on medical grounds and doctors who have taken other leaves during the study period and 2 weeks prior were excluded from the study.

## Study instruments

The questionnaire was designed by the researcher after reviewing previous similar studies and discussion with the supervisors. As this study sample was a group of doctors who were using English as their working language, the study questionnaire was prepared in English language. Questionnaire was comprised of socio-demographic characteristics, details of their work, medical history, psychiatric history, and questions to assess associated factors and stressors.

The extent of burnout was measured using Stanford Professional Fulfilment Index (PFI). It is a 16-item survey consisting of two components which was developed especially to assess burnout and level of professional fulfilment among medical professionals (21). The burnout component assesses burnout based on workload exhaustion and interpersonal disengagement. Studies reported that the burnout components of the Professional Fulfilment Index correlates with the Maslach Burnout Inventory and the professional fulfilment component is correlated with quality of life (21). PFI is in public domain and permitted to use for research or non-profit purposes.

## Data collection

The data collection was done through a self-administered questionnaire form. The form was designed as an online form as well as a printed form on paper. Pre-testing of the data collection form was carried out among sample of doctors working in the Teaching Hospital, Anuradhapura. Relevant modifications for the data collection form were done based on the findings of the pre-test. Doctors were invited to fill the form via email, phone, or social media. An online form was designed using Google forms. Those who were filling the online form had read the consent section prior to filling the questionnaire. The information sheet was linked to the informed consent section. Those who preferred or has practical issues in filling online form were provided with a printed paper copy of the questionnaire form. The information sheet and consent form were attached to the printed questionnaire.

## Data analysis

Descriptive statistics in form of means, standard deviations, and percentages will be calculated. Chi-square test and t-test was used to evaluate differences

in prevalence rates between groups. Variables with P-values < 0.20 were selected for regression analyses. Logistic regression method was used to identify factors associated with burnout. P-values < 0.05 were considered significant, unless otherwise mentioned.

## Ethical considerations

Ethical clearance was obtained from the Ethics Review Committee of Faculty of Medicine and Allied Sciences of University of Rajarata, Sri Lanka.

## Results

There were 587 doctors working in the hospitals and COVID treatment centres at the beginning of data collection. We could not contact 32 doctors due to unavailability of contact details. The final questionnaire was distributed among 555 doctors (459 were from Anuradhapura Teaching Hospital and others were from peripheral hospitals with COVID treatment centres). Response rate was 71% (395). Two (2) doctors informed that they were in maternity leave. We had to reject 10 responses as they did not meet eligibility criteria. A total of 385 responses were included in final analysis.

## Socio-demographic data

Age ranged from 24 years to 62 years with the mean age of 36.11 years (SD=7.19).

Variables		n (%)
Gender	Male	201 (52.2)
	Female	184 (47.8)
Civil Status	Single	94 (24.4)
	Married	291 (75.6)
Staff category	Intern house officer	39 (10.1)
	Medical officer	264 (68.6)
	Post-graduate registrar	16 (4.2)
	Consultant	66 (17.1)
Experience as a doctor	<=5 years	185 (48.1)
	6-15 years	139 (36.1)
	>15 years	61 (15.8)
Workstation	TH Anuradhapura	338 (87.8)
	Other hospitals	47 (12.2)
Working unit	COVID unit	40 (10.4)
	Medical	102 (26.5)
	Surgical	136 (35.3)
	Paediatrics	35 (9.1)
	Laboratory	30 (7.8)
	OPD or ETU	42 (10.9)

(Continued)

Variables		n (%)
Having children less than 12 years	No	207 (53.8)
	Yes	178 (46.2)
Distance to workplace from home	<=50 km	209 (54.3)
	51-100 km	16 (4.2)
	>100 km	160 (41.6)
Living alone or not during workdays	With family or someone else	236 (61.3)
	Alone	149 (38.7)
Chronic medical illnesses	No	314 (81.6)
	Yes	71 (18.4)
Psychiatric illnesses	No	363 (94.3)
	Yes	22 (5.7)
Family history of psychiatric illnesses	No	333 (86.5)
	Yes	52 (13.5)
Substance use	No	329 (85.5)
	Yes	56 (14.5)

### COVID-19 exposure related data

Out of 385 responders 56% (217) were tested for COVID and 16% of them tested positive for COVID-19. Majority of tested positive doctors were treated in a COVID unit (68%, n=24). Quarter of the study sample had to quarantined during the pandemic (Table 2).

Table 2. Frequency data of COVID-19 exposure	
COVID-19 exposure related data	n (%)
• Received complete course of COVID vaccination	377 (97.9)
• Working with confirmed COVID patients	150 (39.0)
• Tested for COVID	217 (56.4)
• Tested positive for COVID	35 (9.1)
• Received hospital treatment for COVID	24 (6.2)
• Quarantined	98 (25.5)

### Data related to challenges and difficulties faced

Most of doctors did not satisfy with the provision of support for occupational safety (69%, n=267). Nearly 14% had experienced discrimination in society because of being a healthcare worker.

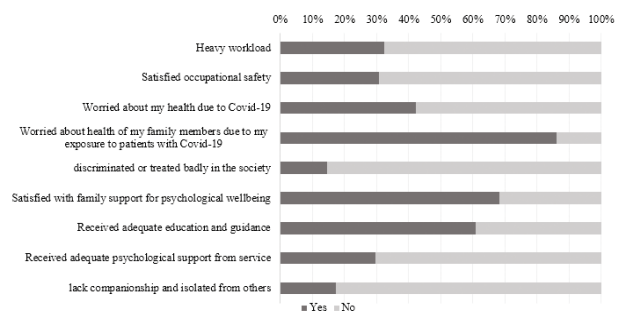


Figure 1. Challenges and difficulties faced during pandemic.

### Burnout and its associations

Composite burnout scores were calculated by averaging work exhaustion scores and interpersonal disengagement scores in PFI scale. The scores were ranged from 0.00 to maximum of 4.00 with mean score of 1.26 (SD=0.78). The work exhaustion (WE) and interpersonal disengagement (ID) score showed similar range as composite burnout scores. Mean scores were 1.56 (SD=0.97) and 0.96 (SD=0.81) respectively for WE and ID. Using the cut-off value of 1.33, the rates for burnout (BO), WE and ID was calculated as 42% (n=160), 55% (n=213) and 31% (n=118) respectively in this study sample.

Mean age of doctors who had burnout was 37.06 years (SD±7.60). Doctors who did not have burnout had mean age 34.77 years (SD±6.34) and this difference was statistically significant (p=0.002).

The initial screening of variables using chi-square test showed that burnout was associated (p<0.05) with, staff category, work experience, having children (less than 12 years of age), history of psychiatric illnesses, treated in-ward for COVID-19 infection, quarantined, level of professional fulfilment, perceived level of workload, worrying about risk to oneself due to COVID-19, experience of discrimination in society, having psychological support from family, having psychological support from services, received adequate education and guidance related to pandemic and feeling loneliness (Table 3). Gender, civil status, working unit, level of support for childcare, distance to workplace, living alone during weekdays, chronic medical conditions, family history of psychiatric illnesses, substance use status and not satisfied about support for occupational safety was not associated with significant differences in burnout prevalence (p>=0.20).

Estimated odds ratios, 95% confident intervals of the odds ratios and p values of the risk factors for developing burnout are showed in Table 4. Figure 2 illustrates the odds ratios and confidence intervals of variables which predicts the burnout.

Table 3. Burnout frequencies by variable categories  
(chi-square test used to compare dichotomous variables)

Variable		Burnout		
		No Count (%)	Yes Count (%)	p
Staff category	Intern house officer	13 (33.3)	26 (66.7)	0.001
	Medical officer	154 (58.3)	110 (41.7)	
	Postgraduate registrar	9 (56.3)	7 (43.8)	
	Consultant	49 (74.2)	17 (25.8)	
Experience as a doctor	<=5 years	96 (51.9)	89 (48.1)	0.000
	6-15 years	79 (56.8)	60 (43.2)	
	>15 years	50 (82.0)	11 (18.0)	
Workstation	THA	195 (57.7)	143 (42.3)	0.183
	BH	27 (69.2)	12 (30.8)	
	DH or less	3 (37.5)	5 (62.5)	
Children less than 12 years	No	27 (81.8)	6 (18.2)	0.016
	Yes	98 (55.1)	80 (44.9)	
	Not applicable	100 (57.5)	74 (42.5)	
Psychiatric illnesses	No	218 (60.1)	145 (39.9)	0.009
	Yes	7 (31.8)	15 (68.2)	
Tested for COVID	No	105 (62.5)	63 (37.5)	0.155
	Yes	120 (55.3)	97 (44.7)	
Tested positive for COVID	No	209 (59.7)	141 (40.3)	0.109
	Yes	16 (45.7)	19 (54.3)	
Treated for COVID	No	218 (60.4)	143 (39.6)	0.003
	Yes	7 (29.2)	17 (70.8)	
Quarantined	No	177 (61.7)	110 (38.3)	0.028
	Yes	48 (49.0)	50 (51.0)	
COVID patient exposure during work	Less commonly	146 (62.1)	89 (37.9)	0.066
	Commonly	79 (52.7)	71 (47.3)	
Professional fulfillment	No	79 (43.2)	104 (56.8)	0.000
	Yes	146 (72.3)	56 (27.7)	
Level of workload	No	178 (68.5)	82 (31.5)	0.000
	Yes	47 (37.6)	78 (62.4)	
Worried about health and safety of self	No	154 (69.4)	68 (30.6)	0.000
	Yes	71 (43.6)	92 (56.4)	
Worried about health and safety of family	No	38 (70.4)	16 (29.6)	0.055
	Yes	187 (56.5)	144 (43.5)	
Discrimination in society	No	200 (60.8)	129 (39.2)	0.023
	Yes	25 (44.6)	31 (55.4)	
Family support for coping work stress	No	61 (50.0)	61 (50.0)	0.022
	Yes	164 (62.4)	99 (37.6)	
Education and guidance regarding COVID	No	78 (51.7)	73 (48.3)	0.030
	Yes	147 (62.8)	87 (37.2)	
Psychological support received from services	No	142 (52.4)	129 (47.6)	0.000
	Yes	83 (72.8)	31 (27.2)	
Loneliness	No	199 (62.6)	119 (37.4)	0.000
	Yes	26 (38.8)	41 (61.2)	

Table 4. Multiple logistic regression analysis: adjusted odds ratio of factors associated with burnout

Predictor	Odds ratio	95% CI Lower	95% CI Upper	p-value
Professional fulfilment (No)	2.79	1.69	4.65	0.0001
Worrying about risk to self (Yes)	3.45	2.10	5.78	0.0000
Excessive workload (Yes)	3.87	2.30	6.62	0.0000
Ref. Work experience (>15yrs)				
Work experience (5-15years)	3.52	1.54	8.62	0.0040
Psychological support from services (No)	1.86	1.07	3.30	0.0300
Psychological support from family (No)	1.95	1.14	3.37	0.0159
Ref. Staff category (Consultant)				
Staff category (House officer)	4.06	1.27	13.45	0.0193

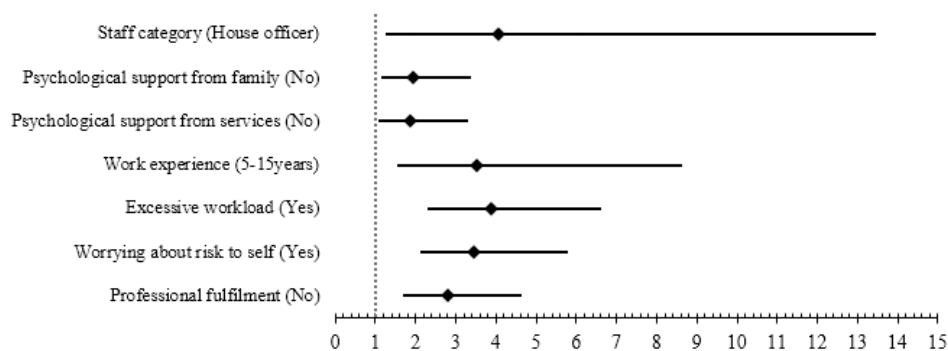


Figure 2. Forest plot illustrating odds ratio and confidence intervals of variables that predicts burnout.

## Discussion

This study showed the prevalence of burnout in the sample of doctors working in COVID treatment hospitals was 42%. This rate is very high compared to a study carried out in Gampaha district in Western province of Sri Lanka during COVID-19 pandemic (22).

A meta-analysis of all three recent corona viruses out breaks (SARS, MERS and COVID-19) reported the prevalence of burnout was 34.4% among HCWs which is much lower compared to our study (23).

A study carried out in USA in physician trainees using PFI scale to investigate the psychological morbidities during COVID-19 pandemic (24). Their rate of burnout was quite similar. The professional fulfilment rate was 25% compared to 52% of doctors had satisfied of their professional work in this study. A study conducted in Singapore reported very high rates of burnout in healthcare workers (25). The available evidence of prevalence data shows higher variability.

There is few comparable published evidence of prevalence of burnout in pre-COVID era in Sri Lanka. A study carried out at National Hospital in Sri Lanka in 2019 reported overall rate of burnout among doctors was 31.3% using Oldenberg Burnout Inventory (OLBI). Sample included house officers, medical officers, registrars and consultants working in National Hospital. Compared to our study the burnout prevalence is lower in this study. Another study investigated the burnout rates in registrars in postgraduate training in Post-Graduate Institute of Sri Lanka using Copenhagen Burnout Inventory (CBI) in the pre-COVID era. They found the prevalence of personal, work-related and client related burnout as 41.6%, 30.6% and 8.9% respectively (26). These may be due to different characteristics of the study populations or difference in methodology. It is important to explore the reasons for these differences in further studies.

We found strikingly higher rate of burnout prevalence in intern house officers, which is 66.7% compared to consultants (25.8%) and it is statistically significant

( $p < 0.001$ ). Higher rate of burnout is also found in doctors with lesser number of years of experience. In addition, the mean age of doctors with burnout was two (2) years more compared to doctors without burnout and it was statistically significant.

### Factors which predict burnout in doctors working in Teaching Hospital, Anuradhapura and dedicated COVID units in Anuradhapura district.

One of the important findings in this study was lack of professional fulfilment as a predictor of burnout among doctors during the COVID-19 pandemic ( $OR=2.79$ , 95%  $CI=1.69-4.65$ ;  $p=0.0001$ ). A large meta-analysis reported that higher level of job stress and poor job satisfaction was associated with adverse mental health outcomes (23). Based on these findings, it is important to explore more about reasons and factors associated with lack of professional fulfilment, because interventions to improve work satisfaction may be protective against burnout and other psychological morbidity in crisis situations.

Worrying about health risks is one of the predictors of burnout ( $OR=3.45$ , 95%  $CI=2.10-5.78$ ;  $p=0.0000$ ) in this study. A study conducted in China also showed worry about personal safety was significantly associated with mental health issues (27). In the previously quoted meta-analysis also found this association (23). This study showed that excessive workload is a risk factor for burnout. The same findings were described in studies done in India, Pakistan, Saudi Arabia, China, Singapore (27, 28, 29, 23, 30).

Stigmatization and discrimination toward healthcare professionals identified as a risk factor of psychological morbidity (27, 31). This study also supported this association.

Designing interventions to improve mental health outcomes should be developed based on evidence found in this study and similar studies. A systematic review found social support and workplace support, effective communication, were protective against negative psychological outcomes in HCWs during the COVID-19 pandemics. Support needed by frontline HCWs may include providing adequate safety equipment, education and training, support for childcare, and psychosocial support and mental health support from relevant services (32).

### Limitations

A third of doctors who got the invitation did not respond. Non responders' data not available and it may have an impact on the findings of this study.

**GU Rambukwella**, Acting Consultant Psychiatrist, District General Hospital, Chilaw, Sri Lanka

**D Ediriweera**, Senior Lecturer in Medical Informatics, Faculty of Medicine, University of Kelaniya, Sri Lanka

**A Isuru**, Consultant Psychiatrist and Senior Lecturer in Psychiatry, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka

**Corresponding author:** GU Rambukwella

**E-mail:** gemunu.rambukwella@gmail.com

### References

1. World Health Organization. WHO Coronavirus (COVID-19) Dashboard [Internet]. [cited 2021 May 27]. Available from: <https://covid19.who.int>
2. Luo M, Guo L, Yu M, Jiang W, Wang H. The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public – A systematic review and meta-analysis. *Psychiatry Res.* 2020; 291: 113190.
3. Krishnamoorthy Y, Nagarajan R, Saya GK, Menon V. Prevalence of psychological morbidities among general population, healthcare workers and COVID-19 patients amidst the COVID-19 pandemic: A systematic review and meta-analysis. *Psychiatry Res.* 2020; 293: 113382.
4. Batra K, Singh TP, Sharma M, Batra R, Schvaneveldt N. Investigating the Psychological Impact of COVID-19 among Healthcare Workers: A Meta-Analysis. *Int J Environ Res Public Health.* 2020; 17(23).
5. De Silva D. How many doctors should we train for Sri Lanka? System dynamics modelling for training needs. *Ceylon Med J.* 2017; 62(4): 233.
6. The World Bank. Physicians (per 1,000 people) - Sri Lanka | Data [Internet]. [cited 2021 Jun 4]. Available from: <https://data.worldbank.org/indicator/SH.MED.PHYS.ZS?locations=LK>
7. Maslach C, Leiter MP. Burnout. In: *Stress: Concepts, Cognition, Emotion, and Behavior* [Internet]. Elsevier; 2016 [cited 2023 Feb 24]. p. 351-7. Available from: <https://linkinghub.elsevier.com/retrieve/pii/B9780128009512000443>
8. Burghi G, Lambert J, Chaize M, Goinheix K, Quiroga C, Fariña G, et al. Prevalence, risk factors and consequences of severe burnout syndrome in ICU. *Intensive Care Med.* 2014; 40(11): 1785-6.
9. Albott CS, Wozniak JR, McGlinch BP, Wall MH, Gold BS, Vinogradov S. Battle Buddies: Rapid Deployment of a Psychological Resilience Intervention for Health Care Workers During the COVID-19 Pandemic. *Anesth Analg.* 2020; 131(1): 43-54.

10. Sandakumari GVN, Wettasinghe I, Fernando V, Abeysundara PK, Nishad N, Jayasinghe S. Prevalence of burnout among doctors in the National Hospital of Sri Lanka. *J of Cey Coll of Phy.* 2019; 50(1): 18.
11. Sen-Crowe B, Sutherland M, McKenney M, Elkbuli A. A Closer Look Into Global Hospital Beds Capacity and Resource Shortages During the COVID-19 Pandemic. *J Surg Res.* 2021; 260: 56-63.
12. 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.
13. Di Tella M, Romeo A, Benfante A, Castelli L. Mental health of healthcare workers during the COVID-19 pandemic in Italy. *J Eval Clin Pract.* 2020; 26(6): 1583-7.
14. Bellanti F, Lo Buglio A, Capuano E, Dobrakowski M, Kasperczyk A, Kasperczyk S, et al. Factors Related to Nurses' Burnout during the First Wave of Coronavirus Disease-19 in a University Hospital in Italy. *International Journal of Environmental Research and Public Health.* 2021; 18(10): 5051.
15. Dobson H, Malpas CB, Burrell AJ, Gurvich C, Chen L, Kulkarni J, et al. Burnout and psychological distress amongst Australian healthcare workers during the COVID-19 pandemic. *Australas Psychiatry.* 2021; 29(1): 26-30.
16. Lasalvia A, Bonetto C, Porru S, Carta A, Tardivo S, Bovo C, et al. Psychological impact of COVID-19 pandemic on healthcare workers in a highly burdened area of North-East Italy. *Epidemiol Psychiatr Sci.* 2020; 30: e1.
17. Ali S, Maguire S, Marks E, Doyle M, Sheehy C. Psychological impact of the COVID-19 pandemic on healthcare workers at acute hospital settings in the South-East of Ireland: an observational cohort multicentre study. *BMJ Open.* 2020; 10(12): e042930.
18. Perera B, Wickramarachchi B, Samanmalie C, Hettiarachchi M. Psychological experiences of healthcare professionals in Sri Lanka during COVID-19. *BMC Psychol.* 2021; 9(1): 49.
19. Crawford JR, Henry JD. The Depression Anxiety Stress Scales (DASS): normative data and latent structure in a large non-clinical sample. *Br J Clin Psychol.* 2003; 42(Pt2): 111-31.
20. Sharma MK, Hallford DJ, Anand N. Confirmatory factor analysis of the Depression, Anxiety, and Stress Scale among Indian adults. *Indian J Psychiatry.* 2020; 62(4): 379-83.
21. Trockel M, Bohman B, Lesure E, Hamidi MS, Welle D, Roberts L, et al. A Brief Instrument to Assess Both Burnout and Professional Fulfillment in Physicians: Reliability and Validity, Including Correlation with Self-Reported Medical Errors, in a Sample of Resident and Practicing Physicians. *Acad Psychiatry.* 2018; 42(1): 11-24.
22. Udayanga L, Perera A, Dissanayaka L. COVID-19-induced anxiety, depression and stress among healthcare professionals in Sri Lanka. *Asian Pac J Trop Med.* 2022; 15(11): 485.
23. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A, Arango C, Moreno C, Ferre F, et al. Impact of coronavirus syndromes on physical and mental health of healthcare workers: Systematic review and meta-analysis. *Journal of Affective Disorders.* 2020; 275: 48-57.
24. 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.
25. Tan BYQ, Kanneganti A, Lim LJH, Tan M, Chua YX, Tan L, et al. Burnout and Associated Factors Among Healthcare Workers in Singapore During the COVID-19 Pandemic. *Journal of the American Medical Directors Association.* 2020; 21(12): 1751-8.e5.
26. Fernando BMS, Samaranayake DL. Burnout among postgraduate doctors in Colombo: prevalence, associated factors and association with self-reported patient care. *BMC Med Educ.* 2019; 19(1): 373.
27. Chen J, Liu X, Wang D, Jin Y, He M, Ma Y, et al. Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China. *Soc Psychiatry Psychiatr Epidemiol.* 2021; 56(1): 47-55.
28. Abdulla EK, Velladath SU, Varghese A, Anju M. Depression and anxiety associated with COVID-19 pandemic among healthcare professionals in India-A systematic review and meta-analysis. *Clinical Epidemiology and Global Health.* 2021; 12: 100888.
29. Singh J, Sood M, Chadda RK, Singh V, Kattula D. Mental health issues and coping among healthcare workers during COVID-19 pandemic: Indian perspective. *Asian J Psychiatr.* 2021; 61: 102685.
30. Teo I, Chay J, Cheung YB, Sung SC, Tewani KG, Yeo LF, et al. Healthcare worker stress, anxiety and burnout during the COVID-19 pandemic in Singapore: A 6-month multi-centre prospective study. Wang J, editor. *PLoS ONE.* 2021; 16(10): e0258866.
31. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental healthcare for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry.* 2020; 7(4): e15-6.
32. De Brier N, Stroobants S, Vandekerckhove P, De Buck E. Factors affecting mental health of healthcare workers during coronavirus disease outbreaks (SARS, MERS & COVID-19): A rapid systematic review. *PLoS One.* 2020; 15(12): e0244052.