

Research Paper

Factors Affecting Psychological Health of Hospital Staff and Coping Behaviour During the COVID 19 Pandemic: A Cross Sectional Study from A Tertiary Care Hospital in Pune

Dr. Dhananjay Kelkar¹, Ms. Dhanashree Bodhani^{2*}, Ms. Shalmalee Vedpathak³,
Mrs. Poonam Gaikwad⁴

ABSTRACT

Background and objectives: The Covid -19 pandemic spread rapidly in India by June 2020 with Maharashtra accounting for the highest number of cases that challenged the physical and psychological wellbeing of health care workers (HCWs). This study conducted at a tertiary care hospital in Pune, explored factors associated with stress and health among Hospital staff and their coping behaviours. This was to identify barriers faced by them in providing health care and devise strategies to improve health care quality during pandemics in future. **Methods:** Questionnaires eliciting personal and demographic details, social experiences, infection related questions, barriers faced by Hospital staff in care giving and that on psychological states of 2941 Hospital staff were administered during the peak phase of the first wave of the pandemic. **Results:** Being in close contact with Covid -19 positive patients, age, gender, being a nurse, having to travel to place of work, relocation of self or family, comorbidity among family members, loss of income, poor knowledge about the pandemic, lack of exercise and poor participation in sports triggered negative emotions among Hospital staff. **Interpretation and conclusions:** The study underlines the importance of interventions at the organisational level that include a conducive work environment that supports hospital staff by periodic evaluation of the problems they face, creating awareness and support groups for women and their families, continuing education on prevention of infections among hospital staff, provision of need based psychological support and focus on exercise and sports based services for hospital staff and their families.

Keywords: Covid -19, Health Care Workers, Tertiary Care Hospital, Psychological Health, Gender, Negative Emotions, Pune

¹Medical Director and Consultant Oncosurgery

²Manager Human Resource Development

³Junior HR Executive

⁴Senior HR Executive

*Corresponding Author

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The World Health Organisation (WHO) declared the Corona virus pandemic as a PHEIC (Public Health Emergency of International Concern) ¹ on January 2020. Healthcare workers (HCWs) including doctors, nurses and all other health care givers and support personnel have played a crucial role in the Covid-19 pandemic. They have been directly involved in the care of patients and have faced an increased risk of exposure to Covid-19¹. Besides an increase in their work volume, they also have had to take on additional responsibilities and adapt to new protocols. Evidence has shown that this has taken a toll on their psychological health and HCWs have experienced psychological distress, anxiety, depression, and sleep disturbances while coping with their care giving responsibilities during the pandemic ²⁻¹¹. The WHO has now recognised and affirmed the need for action to address the impact of the pandemic on the physical and mental health of HCWs¹².

HCWs in India have had to face work overload, erratic work timings, worries about family and friends and the constant pressure of being infected and passing on their infection to their family members, besides the stigma of infection that the pandemic generated. All these factors could have had a tremendous impact on their psychological health. Studies from different parts of India have reported increased prevalence of psychological symptoms like anxiety, depression, stress and insomnia during the course of the pandemic among HCWs. ¹³
-19.

Maharashtra state in India recorded the highest number of Covid-19 cases during the pandemic²⁰ and the city of Pune witnessed a high rise in cases. While few studies from Maharashtra have found that the pandemic led to depression and anxiety among HCWs^{13, 21, 22}, there continues to be a dearth of information on how the pandemic has affected HCWs in hospital settings and how they coped with it.

Deenanath Mangeshkar Hospital and Research Centre (DMHRC), a 876 bedded tertiary care hospital in Pune, had an large load of Covid-19 patients; averaging 1157 patients per month during May 2020 to July 2020.

The study has aimed at assessing the psychological health of hospital staff of DMHRC by exploring the range of negative emotions experienced, identifying factors that controlled or escalated negative emotions among Hospital staff and their coping behaviours during the peak phase of the first wave of the Covid-19 pandemic. As the intensity of Covid-19 changed, information and many other social factors rapidly changed during the pandemic. We monitored these changes with time.

This was particularly important in the pre-vaccination phase of the pandemic. A study of social-psychological and strategic factors influencing mental health would help in designing need-based interventions for hospital staff and support them in providing good quality of care, in times of crisis such as these in the future.

MATERIALS AND METHODS

The present study utilized quantitative methodology. Data collection employed survey method with use of questionnaire as research instrument. To meticulously assess the impact caused by oscillating wave, data collection was carried out at three equal intervals.

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Table I: Timelines of data collection

Phase	Time frame	Data collection start date
1	March 2020-April 2020	2 nd May 2020
2	May 2020-July 2020	1 st August 2020
3	Aug 2020-Oct 2020	1 st November 2020

The survey was initiated for 4198 hospital staff however, only 2941 could respond to the questionnaire in all the three phases.

Table II: Phase-wise number of respondents

Phase 1:	3586	All the three phases: 2941
Phase 2:	3233	
Phase 3:	3218	

Table III: Description of respondents

Types of staff	Count
Consultant (Medical professionals)	144
Doctor (Lecturers, Registrars, Physician assistants, Post graduate medical students, Physiotherapists)	259
Nurse (Nursing staff)	980
Care Providers (<i>Aaya</i> , ward boys)	228
Paramedical (Pharmacists, Dieticians, Technicians)	359
Admin Staff (Receptionist, Billing, Administration etc.)	564
Support group (Housekeeping, Security, Porter etc.)	407
Total	2941

For data collection, three tools were designed and administered by the study team. The questions were framed in English and Marathi language and respondents were given the option.

Tool 1: My Life during COVID-19

The questionnaire covered information about logistics, health parameters of staff and family, recreational activities, social experiences in the pandemic, Covid-19 infection, acquired habits and financial variability. As the Covid-19 changed its intensity, few questions were modified and omitted as per the pandemic situation. Health related information was gained for pre pandemic phase as well. The questionnaire consisted of 42, 46 and 44 multiple choice questions respectively over the three phases where respondents had to choose appropriate option.

Tool 2: My Psychological state

This tool was designed to understand the psychological state of hospital staff. The questionnaire was divided into two parts. Part one ask about “Negative emotions” - fear, stress, anxiety, fatigue, burnout and “Positive emotions” - contentment and pride with 10 statements on each emotion. Part two included 12 statements on “Coping strategies”. The respondents had to rate themselves on four-point rating scale ranging from 1 (strongly disagree) to 4 (strongly agree). In all emotions, 19 statements were inversely scored; 4 (strongly disagree) to 1 (strongly agree). Obtained raw scores ranged from 82 to 328.

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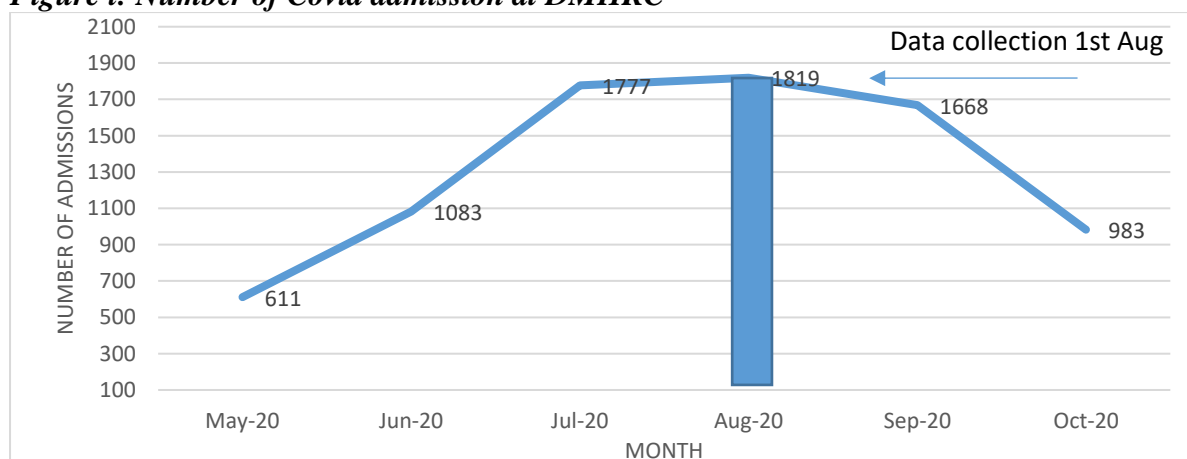
Items were precisely written considering the emotions and intensity of pandemic situation. The test was validated by performing Content validity and is positively correlated with standardized test Generalized Anxiety Disorder Scale-7, Fatigue Assessment Scale and Coping Scale.

Tool 3: Covid-19 Knowledge and Perspective Questionnaire

The questionnaire assessed knowledge about Covid-19 Pandemic. Three sets were prepared separately for medical professionals, paramedic staff and non-medical staff. Each questionnaire consisted of 10 multiple choice questions. Correct answer carried one mark.

This Pandemic wave showed an upsurge in May 2020 to July 2020 in infection, which is considered as peak phase of the first wave of pandemic. Hence study focused only on the peak phase.

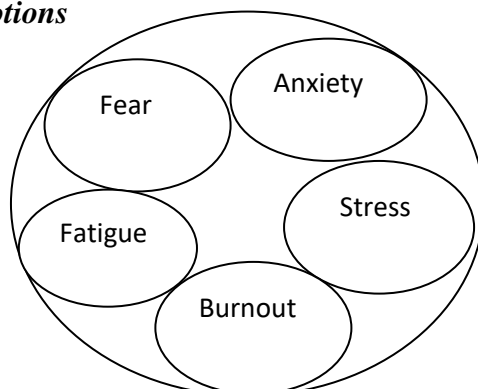
Figure i: Number of Covid admission at DMHRC



RESULT

The study focused only on 5 sets of negative emotions which were classified as the dependent variable.

Figure ii: Negative emotions



Principal Component Analysis (PCA) was performed for five negative emotions as they were highly correlated with each other. A single component was extracted from the PCA which was used for further analysis. The PCA score range was -2.62 to 4.37 with M 0.00 and SD 1.00.

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Table IV: Principal Component Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.074	81.487	81.487	4.074	81.487	81.487

Whereas, independent variables included staff details, accommodation, transport, family related details, coping strategies adopted by the hospital staff and knowledge score.

Table V: Details of independent variables

Staff Details:
Type of Hospital staff
Health care worker/ Non health care hospital staff
Gender
Age
Accommodation, Transport details:
Transport Arrangement
Severity of hurdles in reaching hospital
Current Accommodation
Number of rooms
Number of Toilets
Relocation of family members/ self
Family details:
Staying with Family member/s
Medication of family members
Loss of Family income
Coping strategies:
Exercise
Sports
Recreation
Knowledge score

- Approval was sought from the Institutional Ethics Committee at DMHRC
- Questionnaires were set on internal software ‘Adrenalin’ and for those who had difficulty in operating the software ‘Google forms’ were prepared.
- Statistical analysis was done using IBM SPSS software version 20.
- T tests and ANOVA were done to see if there was a significant difference between groups of independent variables and dependent variable.
- Following this, stepwise multivariate analysis was done. Factors that were found to be significant in t tests and ANOVA were included in multivariate analysis.

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Table VI: Univariate analysis

Independent variable	Groups	N	M	SD	Result	Effect size	Effect Interpretation
HCW/ NHCH	Non healthcare	1330	-0.280	0.946	t(2939)=-14.264,p=0.00*	Cohen's d = 0.53	Medium
	Healthcare	1611	0.231	0.984			
Gender	Male	887	-0.297	1.017	t(1604.610)= -10.580,p=0.00*	Cohen's d = 0.43	Medium
	Female	2054	0.128	0.965			
Type of Hospital staff	Admin Staff	564	-0.323	0.915	F(6,839.860)=6.0039,p=0.00*	est. w ² = 0.11	Small
	Care Providers	228	0.067	0.893			
	Consultant	144	-0.531	0.991			
	Doctor	259	0.187	1.088			
	Nurse	980	0.393	0.913			
	Paramedical	359	-0.365	0.980			
	Support group	407	-0.145	0.948			
Age	18 to 29	1483	0.240	0.953	F(4,2936)=58.808, p=0.00*	w ² = 0.07	Medium
	30 to 39	801	-0.123	0.962			
	40 to 49	499	-0.333	0.992			
	50 to 59	132	-0.461	0.992			
	60 and above	26	-1.191	0.844			
Staying with Family member/s	No	882	0.350	0.950	t(2939) = 12.754, p=0.00*	Cohen's d = 0.52	Medium
	Yes	2059	-0.150	0.984			
Relocation family members self	Yes	654	0.341	0.941	t(2939) = 10.052, p=0.00*	Cohen's d = 0.45	Medium
	No	2287	-0.097	0.995			
Current Accommodation	Hostel	721	0.456	0.908	F(3,2937) = 78.112, p=0.00*	W ² = 0.07	Medium
	Own House	1294	-0.216	0.973			
	PG accommodation	36	0.295	1.052			
	Rented House	890	-0.067	0.987			
Transport Arrangement	Public Transport	75	0.160	0.949	F(2,2938) = 78.477, p=0.00*	W ² = 0.07	Medium
	Self Arrangement	1973	-0.157	0.993			
	Transport facility of DMH	893	0.333	0.934			
Severity of hurdles in reaching hospital	Relatively easy / NA	1909	-0.051	1.023	F(2,302.947) = 11.086, p=0.00*	est. w ² = 0.007	Small
	Faced some difficulties	918	0.061	0.928			
	Faced lots of difficulties	114	0.368	1.071			
Family members	Yes	121	0.220	1.052	t(2939)= 2.470, p=0.014*	Cohen's d = 0.22	Small

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on medication	No	2820	-0.009	0.997			
Family income affected negatively	Yes	2087	0.099	0.983	t(2939) = 8.494, p=0.00*	Cohen's d = 0.34	Small
	No	854	-0.242	1.001			
Exercise	Yes	1704	-0.106	1.005	t(2707.957) = -6.827, p=0.00*	Cohen's d = 0.25	Small
	No	1237	0.146	0.975			
Sports	Yes	338	-0.228	0.973	t(2939) = -4.471, p= 0.00*	Cohen's d = 0.26	Small
	No	2603	0.030	1.000			
Recreation	Yes	1326	-0.047	0.993	t(2939) = -2.311, p=0.021*	Cohen's d = 0.09	Small
	No	1615	0.039	1.004			
Number of rooms					r = -0.110, p=0.00*		Small
Number of Toilets					r= -0.088, p=0.00*		Small
Knowledge about the pandemic					r=-0.199, p=0.00*		Small

* Significant at the 0.05 level

T tests and ANOVA revealed that HCWs who directly came in contact with infected or suspected Covid - 19 patients experienced more negative emotions as compared to those who did not.

Female Hospital staff experienced more negative emotions as compared to male. Among these, nurses experienced more negative emotions as compared to other Hospital staff.

As the age of hospital staff progresses, negative emotions were less experienced. Hospital staff experienced more negative emotions who stayed away from their families, who had to change their own or family member's residence and hostelits as compared to others.

Hospital staff who were unable to use their own mode of transport and had to depend on disrupted public transport or that arranged by the hospital were more prone to negative emotions as opposed to those who could arrange for their own transport. Hospital staff who had to face a high number of hurdles in reaching the hospital experienced more negative emotions as compared to those who faced lesser hurdles.

Hospital staff who had family members with medical condition were more prone to negative emotions as compared to those who did not have a family member with underlying conditions. Loss of family income impacted on experiencing more negative emotions than those who did not. Negative emotions were more among Hospital staff who did not exercise, and low in Hospital staff who undertook sports and went for recreational activities.

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Table VII: Multivariate analysis

Model	Unstandardized Coefficients		Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.346	0.147		2.347	0.019
HCW/NHCH	-0.144	0.052	-0.072	-2.739	0.006
Age	-0.011	0.002	-0.104	-4.86	0.000
Gender	-0.111	0.04	-0.051	-2.775	0.006
Type of Hospital staff	-0.07	0.014	-0.141	-4.837	0.000
Relocation of family or self	0.195	0.042	0.081	4.687	0.000
Type of accommodation	0.069	0.02	0.082	3.473	0.001
Severity of hurdles faced in reaching hospital	0.19	0.031	0.107	6.093	0.000
Family members on medication	0.225	0.084	0.045	2.688	0.007
Loss of family income	0.395	0.037	0.179	10.635	0.000
Knowledge about the pandemic	-0.027	0.008	-0.061	-3.224	0.001
Exercise done or not done	-0.168	0.035	-0.083	-4.835	0.000
Sports done and not done	-0.125	0.054	-0.04	-2.332	0.02

Multivariate regression analysis found that the factors that were found significant in t test and ANOVA included being in direct contact with Covid-19 positive patients, age, being a female Hospital staff, being a nurse, having to relocate self or family members, having to stay in a hostel , difficulties encountered while traveling to the hospital for work, poor health condition of family members (indicated by medications taken), loss of family income, poor knowledge about the pandemic and lack of exercise and participation in sports. Large beta value of multivariate analysis show factors which affect most on negative emotions.

DISCUSSION

Covid -19 has been a source of great psychological crisis, especially for HCWs who have been at the core of this pandemic ^{14, 23, 24}. In the first phase of the pandemic, information on causes, transmission modes and treatment were evolving. In this uncertain situation HCWs continued to treat patients directly with the available information. Thus, HCWs who were directly in contact with patients had to undergo a great amount of anxiety and stress as compared to non-Health care hospital staff. Several studies ^{2, 7, 9, 11, 16, 19, 23, 24, 25, 26} have also found that HCWs who were in direct contact with patients showed symptoms of stress, anxiety, depression, burnout, lack of sleep as compared to those who were not.

Female hospital staff working in the hospital were more prone to negative emotions as compared to men. A possible reason is that women working in the hospital had to undergo the double burden of work – performing professional duties in the hospital and carryout household tasks such as cooking, cleaning, and taking care of the family members. Due to the lockdown, services of maids were unavailable which led to exhaustion. The burden of carrying the infection to other members in the family is also likely to have a negative impact on the morale of the female Hospital staff. Several studies ^{1, 27, 28, 29, 30} from India and other countries have shown that women experienced more symptoms of fear, anxiety, depression as compared to men due to increased burden of work and the fear of infecting others.

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Nurses were the ones to experience more negative emotions as compared to other Hospital staff, for the reason that the proximity to infection was more in Nurses. Studies from different parts of the globe have also shown that nurses experienced high levels of anxiety and stress during the course of the pandemic ³¹.

Among the hospital staff, adults who were relatively older appeared to maintain realistic perceptions of risk, showed significantly better emotional wellbeing and less reactivity to life stressors as compared to young adults. This is because older people are more likely to have faced major life events in the past and lived through them, making them resilient to challenges such as these. Younger staff on the contrary could have perceived their social, economic and occupational prospects to be more threatened by the Covid-19 pandemic. In addition, repeated concern expressed by family members, information from social media may have contributed to anxiety among younger group of hospital staff. A study in China also found that medical staff below the age of thirty was more prone to depression as compared to older, although the association was not found to be statistically significant ³². Greater use of social media by the younger generation is also a likely reason.

During the peak of the pandemic, Hospital staff working directly with patients had to stay away from families to prevent infection spread to family members. In addition to this, physical gatherings and the natural means of socialization were also restricted during the lockdown period. The Hospital staff who stayed away from family members experienced more negative emotions as compared to those who could stay with family members. This is interesting because the worries about infecting their families and the family support can potentially work in opposite directions. The results indicate that psychologically family support was a stronger factor than the concern about infecting the family. Hospital staff who stayed in hostels were found to have more negative emotions as compared to those who did not. This could be because they were exposed to the constant threat of infection. This also underlines the importance of support from family in the pandemic situation.

Many of the Hospital staff worried about being infection bearers and transmitting infection to their family members and other people. The study found that Hospital staff who lacked knowledge on the modes of transmission and symptoms of Covid-19 were more fearful and experienced negative emotions as compared to those who had better knowledge about Covid-19. Another study in China also found that lack of knowledge about the pandemic led to fear, anxiety and stress among health care workers³³. This highlights the need of continuous education effort for hospital staff.

Few of the landlords and housing societies asked Hospital staff to move from their current house because of the fear of the spread of infection from them. Studies from other parts of the country have shown that Hospital staff faced considerable stigma due to the fear of the spread of infection from them³⁴. DMHRC took into consideration the situation of the Hospital staff and provided accommodation in the hospital premises with due protective measures to deal with the situation. However, the inconvenience the Hospital staff had to face due to the burden of social restrictions and staying away from family members made them more vulnerable to negative emotions. Other studies have also shown that HCWs who had to stay away from their family suffered from anxiety and stress³⁵.

The pandemic also had a severe impact on the livelihoods of people. There were many cases where the family members of the hospital staff lost their jobs leading to significant decrease

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in family income. This increased the pressure on the hospital staff as they became the main earning members of the family leading to increase in negative emotions among the hospital staff. In the multivariate analysis, the financial factors seem to have the highest importance in governing stress and negative emotions.

There were many ways in which the Hospital staff tried to cope with these times. 74% who went for regular exercises and 27% who engaged in sports before the pandemic, faced a number of limitations as gyms, fitness studios and swimming pools, playgrounds were closed. As an alternative, Hospital staff coped by taking walks, coming to the hospital on bicycle, doing indoor exercises and playing games that helped them relax. The study found that Hospital staff who did not go for regular exercises and sports experienced more negative emotions as compared to those who undertook exercises and sports. A study from the USA found that physical activity and exercise were endorsed by HCWs as the most common coping mechanism against pandemic related stresses²⁵ while another one from Singapore found that reduction in exercise duration was a significant risk factor for mild stress to moderate to severe depression among HCWs³⁵.

Other studies among nurses involved in patient care during severe disease outbreaks have also found that self-care activities such as workout, meditation, music and listening to podcasts for coping with the stress helped improve psychological well-being during the crisis¹².

The findings of this study are important from the point of view of planning for disasters and pandemics and preparing public and private hospitals to deal with such events in the future. The findings direct attention at the need to increase awareness at the community and familial level on the pressure and work load endured by women in pandemic or disaster situations. The findings call for the need to provide better support services at the hospital level and increase sensitivity at the community and familial level towards women working in health care settings.

Regular screening for mental health issues in the hospitals, developing familial and peer support and counselling groups, online sessions by a psychologist can greatly help in overcoming mental health problems among Hospital staff. The study also highlights the importance of continuous medical education to make Hospital staff more aware of the causative and preventive aspects of pandemics such as these in the future.

The findings of the study highlight the important role that physical activities such as sports and exercises play in improving morale and maintaining a positive frame of mind in times of crisis such as these. Providing sports and exercise facilities in the hospital premises and encouraging Hospital staff to undertake these as a part of positive health care practices can go a long way in improving the psychological health of Hospital staff not only in times of crisis, but also in their everyday care giving routines. DMHRC already has a Lifestyle Intervention Centre in place that encourages sports and exercise to maintain positive health. Hospital staff can be encouraged to engage more in such activities.

Inclusion of mental health care services as a part of emergency or disaster response strategies at the policy level is essential to improve the performance of Hospital staff who have to work under conditions of high stress and limited resources. Promotion of sports and exercise to maintain positive physical and mental health should also be prioritised at the

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policy level to cope with the day to day stresses that Hospital staff experience in health care settings.

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Conflict of Interest

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