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Research Paper

Psychological effects of COVID-19 pandemic among frontline nurses and targeted intervention to mitigate its effects: Experience from a tertiary care center

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ABSTRACT
Healthcare workers who were exposed to COVID-19 are at a high risk of not only the viral infection, but also of developing mental health-related problems. Theperceived risk of contracting the COVID-19 infectionimpacts HCP emotionally, mentally, and physically, and may ultimately lead to the development of post-traumatic stress disorder (PTSD). To prevent PTSD and other serious psychological conditions, it is important to implement interventions to counteract the adverse psychological impact of COVID-19 on frontline HCP.
The objectives of this study were to assess the level of perceived stress and potential correlates among frontline nurses during the COVID -19 pandemic. Depending on the level of need, we provided targeted intervention and measured the effectiveness of this interventionamong frontline nurses.

A total of 147 Frontline nurses working in COVID-19 ICU's of Kasturba Hospital, Manipal, Karnataka, who were willing to participate in the study and willing to undergo the targeted intervention programme were selected using convenience sampling. The Perceived Stress Scale was to assess the level of perceived stress and potential correlates among the frontline nurses during the COVID-19 pandemic and Compassion Fatigue Assessment Scale was used to assess the level of fatigue among frontline nurses. Targeted interventions were developed and interventions were provided by the psychiatry department as deemed appropriate.
Results shows that, majority of the frontline nurses (89.11%) had moderate stress at baseline, and only 44.85% had moderate stress after the targeted interventional programme. compassion fatigue assessment, no cause for immediate concern were (36.73%) and (33.3%) of the frontline nurses were seeking for professional counselling but after the individual and group counselling majority (74.26%) had no cause for immediate concern and only (3.67%) seeked further professional counselling.
It is particularly important for the frontline workers to be provided with coping tools and guidance regarding the potential deleterious outcomes of long-term stress. This is especially important since these frontline workers have been battling the challenges of this pandemic tirelessly. Consideration of these aspect is directed toward the frontlines that battle the challenges of this pandemic. This study explores perceived stress level of frontline nurses, specifically examines the demographic variables that determine perceived stress and interventions to maintain their psychological well-being.
KEYWORDS: *Psychological effects, COVID 19, Frontline nurses.*

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I. INTRODUCTION

The COVID-19 outbreak was declared by the World Health Organization (WHO) as a public health emergency of international concern on 30 January 2020 [1]. It was declared a pandemic on 11 March 2020. In addition to the community members, health care providers are also at risk of higher psychological distress due to longer working hours and high risk of exposure to the virus [2]. This may also lead to stress, anxiety, burnout, depressive symptoms, and the need for sick days or stress leave. The nature of their work have put them on the frontline of vulnerability to COVID-19, which would harm the capacity of the health system to provide services during this crisis. Such vulnerability can lead to stress and uncertainty. The pandemic not only affects physical health but also mental health and well-being[3]. Mental health and psychosocial consequences of the COVID-19 pandemic may be particularly serious for health professionals because of a higher level of exposure to the virus and to the stress associated with managing heavy and emotional demands at work [4]. A poorly known contagious disease outbreak, like COVID-19, leads to unavoidable stress, fear, and anxiety that can be profound among the higher-risk groups, such as healthcare professionals including nurses. The mental well-being of healthcare professionals can be negatively affected by fear of being exposed to COVID-19 patients in hospitals, being separated from families, confronting the death or illness of patients from COVID-19, and direct work hazards of exposure.Understanding the psychological impact of the COVID-19 outbreak on nurses is important for health authorities to develop preventive strategies and effective treatment modalities to alleviate its negative outcome [2].

The objectives of this study were to determine the amount of perceived stress and compassion fatigue, and its correlates among frontline nurses during the COVID-19 pandemic, and to establish a focused intervention programme. We hypothesized that after undertaking targeted intervention programme, there will be a substantial change in mean stress scores and compassion fatigue assessment scores among frontline nurses.

II. MATERIAL AND METHODS

2.1 Participants

This was a single arm intervention study, carried out at Kasturba Hospital, attached to Kasturba Medical College, Manipal, a tertiary care center in Udupi district of Karnataka, in south India. The hospital has 2032 beds, and caters to patients coming from coastal and interior parts of Karnataka and neighbouring states of Kerala and Goa. Institutional Ethics Committee, Kasturba Hospital, Manipal approved the study (IEC850/2020), and we obtained administrative approval from Medical Superintendent of Kasturba Hospital. Participants included all frontline intensive care unit (ICU) nurses working in the hospital and involved in covid care. Nurses working in non-covid areas were excluded from the study. Written informed consent was obtained from the study participants.

2.2 Measures

A proforma designed for the study was used to collect the socio-demographic details. We used the self-rated *Perceived Stress Scale* (PSS, Cohen et al. 1988) to measure the current levels of stress experienced. The questions ask about the feelings and thought in last month. It has 10 items measured on a five‑ point Likert scale (0: never, 1: almost never 2: sometimes 3: fairly often 4: very often). Cronbach's alpha for 10-item PSS ranged from 0.74 to 0.91 across studies (Lee 2012). It has been used among nurses in Indian studies [5]. We used the *Compassion Fatigue Assessment Tool* (CFAT) developed by Nursing Executive Center, to determine the risk of emotional burnout among the frontline nursing staff. The staff is appraised about the concept of compassion fatigue, and the self-evaluation form is administered. It contains 18 yes/no questions, of which 9 items each identify the visible and invisible signs of compassion fatigue. The maximum possible score is 18, with higher score indicating higher compassion fatigue. The scores are further interpreted as: 0–2: No cause for immediate concern; 3–5: Investigate root causes of "Yes" answers; 6–18: Seek additional professional counseling. Action was planned based on the scores obtained on CFAT.

2.3 Procedure

Participants who met the sampling criteria were included and provided with a participant information sheet. The purpose of the study was explained and a written consent was obtained. Anonymity and confidentiality were ensured throughout the study. Baseline demographic data was obtained from all the participants. We administered PSS and CFAT at baseline on all the participants. On CFAT, those scoring 3 to 5, the root cause was sought. Those with score 6 or more on CFAT were provided with specific interventions. A post-assessment was done after one month of the intervention on PSS and CFAT.

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2.4. Intervention

Specific interventions were done by 3 psychiatric social work staff and 4 trainees. We carried out psychosocial assessments for all the nursing staff identified for interventions. Nursing staff posted in COVID-19 wards reported fear of getting infected and spreading it to their family members. They also reported stress related to wearing personal protective equipment (PPE) kits and the high workload during the initial days of working in Covid areas. However, over the period, they were able to cope with it well. Single-session interventions were carried out for most of the nursing staff. This included components such as establishing therapeutic alliance, facilitation for ventilation, providing reassurance, emphasis on effective stress management and coping, strengthening support systems, and liaising with the supervisory staff.

2.5 Statistical analysis

The Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago) was used for data analysis. Descriptive statistics included means and standard deviations for continuous variables, and frequency and percentage for categorical variables. Data normality was checked using Shapiro-Wilk test and histogram analysis. Paired sample t-tests were conducted for PSS and CFAT pre- and post-test scores. P less than 0.05 (2-tailed) were considered significant.

III. RESULTS

3.1 Description of sample characteristics

A total of 147 frontline nurses participated in this study. Of them, 132 (89.79%)were females, 15 (10.20%) were male, and 62 (42.17%) were in the age group of 20-25 years of age. Majority 97 (65.98%) were having educational qualification as diploma in nursing. Most of the frontline nurses 111 (75.51%) belonged to Hindu religion. 97 (65.98%) were having educational qualification as diploma in nursing. Majority of the nurses were unmarried 92 (62.58%). Two-third 102 (69.38%) belonged to nuclear family. Of note, 86 (58.50%) of the frontline nurses were taking care of elderly at home, and 15% of the nurses reported that they have been socially discriminated. 48 (32.70%) of the nurses reported using public transport to travel to their workplace. Majority of the nurses (106) 72.10% reported that they get tired easily and 57 (38.80%) wished to seek professional help from ward sisters. (Table 1)

All 147 participants completed the baseline assessments on PSS and CFAT. Of them, 136 (92.5%) completed the assessments post-intervention. The reliability of the tool on perceived stress scale and compassion fatigue assessment scale, computed using Cronbach's alpha, were 0.91 and 0.88 respectively. Based on CFAT score, 54 (36.7%) did not have any cause for serious concern, 44 (29.9%) required looking at root cause of concern, and 49 (33.3%) required professional counselling. At baseline, 146 (89.1%) had moderate level of stress, one (0.7%) had severe stress, and 15 (10.2%) had low stress. Assessment after a month showed that 61 (44.8%) had moderate and 75 (55.1%) had mild stress.

Table 1: Frequency and percentage distribution of Demographic information of the nurse managers with pre and post-test data (N=147)

Cohort characteristics	*Frequency*	*Percentage*
Gender		
Male	15	10.20
Female	132	89.79
Age in years		
20- 25	62	42.17
26- 30	44	29.93
31- 35	29	19.72
36- 40	5	3.40
41- 45	4	2.72
46- 50	2	1.36
>50	1	0.68
Educational status		
Diploma in Nursing	97	65.98
Bachelor's in Nursing	49	33.33
MSc Nursing	1	0.68
Religion		
Hindu	111	75.51
Christian	33	22.44
Muslim	3	2.04
Marital status		
Married	55	37.41
Unmarried	92	62.58

Type of family		
Nuclear	102	69.38
Joint	45	30.61
Place of stay		
Home	92	62.58
Hostel	55	37.41
Care of elderly		
Yes	86	58.50
No	61	41.50
Feeding mothers		
Yes	9	6.10
No	107	72.80
Not applicable	31	21.10
Socially discriminated		
Yes	22	15
No	125	85
Mode of transportation		
Own vehicle	39	26.50
Public transport	48	32.70
others	60	40.80
Distance travelled to workplace		
<5 kms	69	46.93
6 -10 kms	29	19.72
11- 20 kms	24	16.32
21- 30 kms	18	12.24
>30 kms	7	4.76
Staff experience in the last few months		
Fear that you will suffer		
Yes		
No	44	29.90
Forget things easily	103	70.06
Yes		
No	7	11.60
Difficult to concentrate	140	95.23
Yes		
No	49	33.30
	98	66.66
Problems falling asleep		
Yes		
No	47	31.97
Dread going to work	100	68.02
Yes		
No	71	48.29
Irritated	76	51.70
Yes		
No	79	53.70
Gets tired easily	68	46.25
Yes		
No	106	72.10
	41	27.89
Professional help		
Yes	57	38.80
No	90	61.20

Figure 1: Pre-and post-test scores of perceived levels of stress among frontline nurses

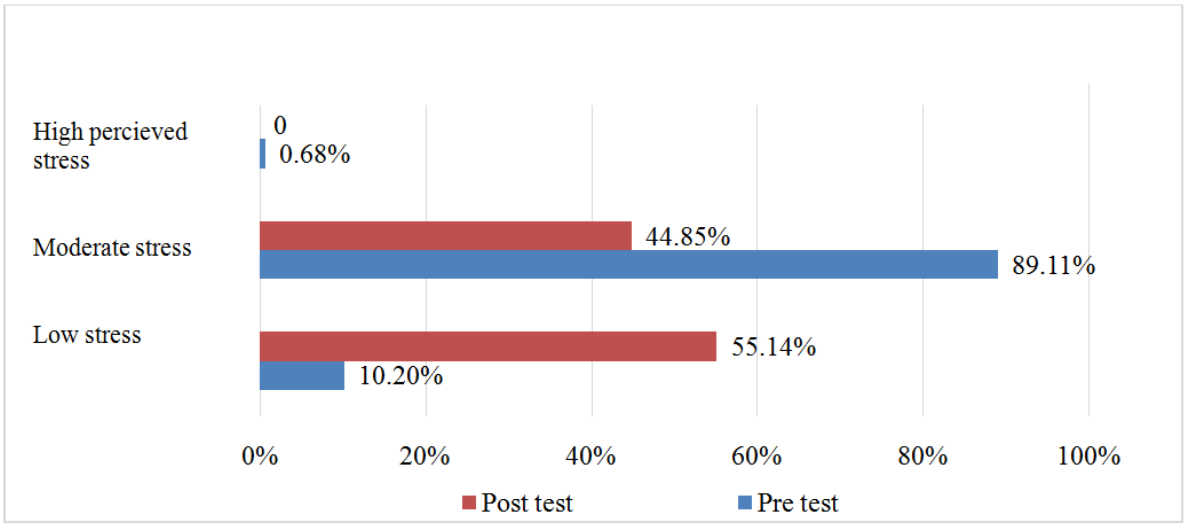

Figure 2: Pre-and post-test scores of compassion fatigue assessment among frontline nurses

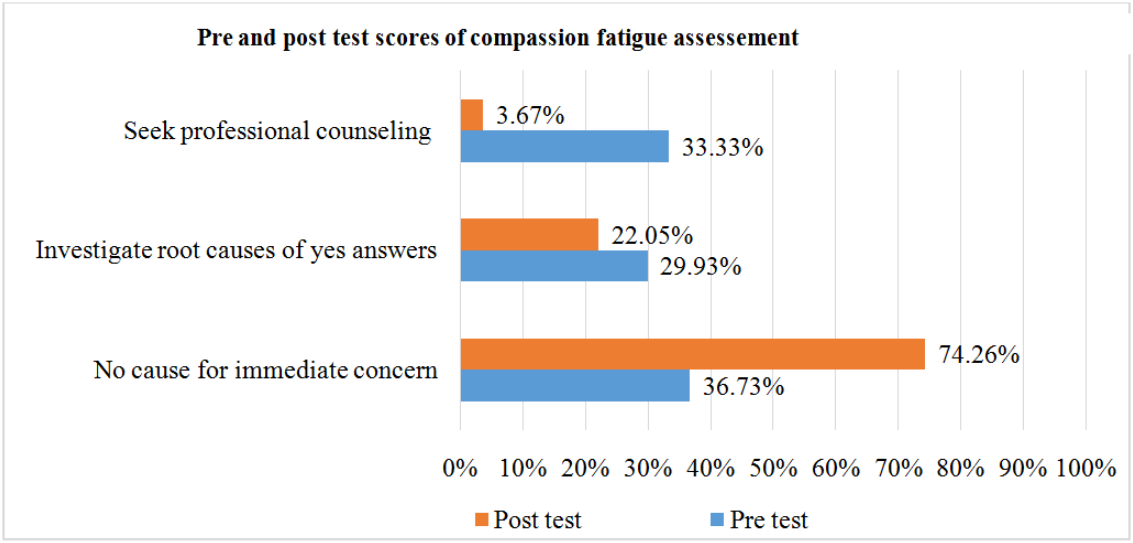

Table 2: Comparison of pre and post test scores compassion fatigue assessment among frontline nurses after receiving intervention (N=136)

CFS	Min – max score	Pre test		Post test	
		f	%	f	%
No cause for immediate concern	0- 2	54	36.73	101	74.26
Investigate the root cause Seek professional counseling	3 – 5	44	29.93	30	22.05
	6 – 18	49	33.33	5	3.67

Table. 2:Paired sample t-test results for pre and post test scores of perceived stress and compassion fatigue among frontline nurses (N=136) after receiving intervention

Intervention Group	N	Mean	SD	SE. mean	Paired t - test		
					t value	df	P value
PSS							
Pre-test	136	18.99	4.21	0.36	11.478	135	<0.001**
Post-test	136	12.99	4.783	0.41			
CFS							
Pre-test	136	4.56	4.35	0.37	7.025	135	<0.001**

Post-test	136	1.51	2.40	0.21

PSS = Perceived stress scale; CFS = Compassion fatigue scale; N = Number of participants; M = Mean test scores; SD = Standard Deviation; **P value <0.001

There was a significant mean difference between pre-test and post-test PSS test scores among the frontline nurses who received intervention (t135 = 11.478, P value <0.001). Mean post test score is 6 points lower than pre test scores with (95% CI: 4.97, 7.04), showing a significant reduction in the stress levels among nurses. The assumption of normality was tested and satisfied based on Shapiro-Wilk test, W (136) = 0.99, p = 0.65. The paired sample T-test yielded a statistically significant mean difference between pre-test and post-test CFAS test scores among the frontline nurses who received intervention (t135 = 7.025, P value <0.001). Mean post-test score is 3.04 points lower than pre-test scores with (95% CI: 2.19, 3.90), showing significant reduction in the compassion fatigue levels among nurses.

IV. DISCUSSION

The current study revealed that majority of the frontline nurses (89.11%) had moderate stress, (10.20%) had low stress, and after the targeted intervention, 44.85% had moderate stress and 55.14% had low stress. In the compassion fatigue assessment, no cause for immediate concern were 36.73%, investigate the root causes of yes answers were 29.93% and 33.3% of the frontline nurses were seeking for professional counselling; but after the intervention, 74.26% had no cause for immediate concern and only 3.67% requested further professional counselling.

About 37 (25.17%) staff seeked help from their ward sister, psychosocial interventions were carried by the ward sister at the departmental level, to keep the staff informed and assist them in following mental health tips and strategies to look after themselves as well as others in the community.The objective of the intervention was to offer basic psychosocial support to staff, through telephonic counselling/ 'compassionate talking' such as: listening non-judgmentally; giving re-assurance and general information; and encouraging self-help and other support strategies. Importantly, in the peak of a pandemic, interventions such as psychological debriefing, critical incident stress debriefing or any other single session intervention mandating staff to talk about their thoughts or feelings are not recommended. That said, compassionate and sensitive awareness of the impact of critical care on health care professionals can be used to facilitate one on one support, should that person wish it [6].

The strength of the study was to plan and screen the frontline nursing professionals working in covid wards to identify stress and fatigue, and provide appropriate intervention after triaging as per their need. Interventions were carried out by psychiatric social work staff and trainees. Initially, psychosocial assessments were carried out for all the referred nursing staff. Nursing staff posted in COVID-19 wards reported fear of getting infected and spreading to their family members. They also reported stress related to wearing PPE kits and the workload during the initial days. However, over the period, they were able to cope with it well. Single-session interventions were carried out with the nursing staff. They included components such as establishing a therapeutic alliance, facilitation for ventilation, providing reassurance, emphasis on effective stress management and coping, strengthening support systems, and liaising with supervisory staff. This study is supported by other similar study which was conducted in China among the medical staff on mental health care during the COVID 19 outbreak. Training and support for health professionals at 'high exposure risk' were given to identify and manage emotional reactions, that may hinder their clinical work in frontline health delivery, that included managing anxiety, fear of contagion, episodes of acute stress or promoting self-care/reducing burnout. The main objective of this approach was to maximise psychological resilience in as many professionals as possible who have frontline duties during a pandemic [7].

Several training programs have been used in different centres to reduce compassion fatigue and increase resilience. For example, attending a one-day workshop on Self Compassion for Healthcare Communities (SCHC) program increased compassion and resilience, and decreased burnout, anxiety and stress among pediatric nurses during covid-19 pandemic [8]. Similarly, a Wellness Partner Program was found to be beneficial for frontline nurses to cope with stress during covid-19 [9]. Our program was unique as we could provide specific psychosocial intervention depending on the need of the frontline workers, rather than implementing a universal program meant for all.

There are some limitations of the study. We did not have a control group without intervention. The study sample included staff nurses in a tertiary care center, which limits generalizability. Only perceived stress was assessed as an outcome measure, and we did not examine anxiety or depression which were common among front line healthcare professionals. Also, no formal assessment of resilience was done.

V. CONCLUSION

Most of the frontline nurses had anxiety, depression, and stress in response to the COVID-19 outbreak respectively. This prevalence is high and nurses are highly affected psychologically during the pandemic which suggests psychological health interventions like psychological counseling and group meeting sessions. It is better to create awareness for the community, avail a guideline, train nurses, and give special attention to nurses with chronic disease and a history of mental disorders to minimize the psychological impact of the COVID-19 pandemic on nurses and protect their mental health.

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