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PERCEIVED STRESS AND COPING AMONG ONCOLOGY HEALTH CARE WORKERS (OHCW) DURING THE COVID-19 PANDEMIC IN A TERTIARY CANCER CENTRE IN INDIA

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Abstract – *Objective:* *The objective of the study is to estimate the level of the COVID-19 related stress and perceived stress and the pattern of coping styles among Oncology Health Care Workers (OHCW) during the COVID-19 pandemic.*

Patients and Methods: *The cross-sectional study was conducted in a tertiary cancer centre in the rural part of Kerala (India). The OHCW working in the centre during the COVID-19 pandemic were included, andstudents and observers were excluded from the study. The COVID-19 stress rating scale, perceived stress scale and brief-COPE were used to collect the data.*

Results: *Data were collected when the COVID-19 cases were in their first peak in Kerala. Two hundred and eighty two OHCW participated in the study.The COVID-19 stress of 5 or above was reported by 48.6% of OHCW. More than half (59.6%) of them reported moderate to severe perceived stress. On the Brief-COPE scale, the mean score of approach coping was 35.58 and of avoidance coping was 24.26. A significant positive correlation (r =0.347) was found between COVID-19 related stress and perceived stress. Significantly high stress was found among males, front office staff, those between 30 and 40 years, with a history of the COVID-19 contact and those with co-morbidity.*

Conclusions: *Although half of the OHCW reported high COVID-19 related stress and perceived stress, they used an approach coping style to deal with the stress during this pandemic.*

KEYWORDS: *Oncology health workers, Perceived stress, Coping, COVID-19 stress.*

INTRODUCTION

The COVID-19, which emerged in 2019, has a negative impact globally in different trajectories of human life. Specifically, the virus has affected the medical, economic and public health sectors worldwide[1]. Without any experience in dealing with a global public health disaster in recent times, this affects the emotional well-being of front line medical workers[2]. This is important, especially when they are uncertain about the disease, have increased workload, are at risk of developing the infection, and spread it to their families[3]. Along with this, unscheduled work timing, reduced staff availability, administrative work, distressed patients, patient deaths, a complex hierarchy of authority, and family-related responsibilities contribute significantly to their work stress[4]. Those health workers dealing with chronic illnesses like cancer may have higher work stress as they have to deal with immunosuppressant people. They are at high risk of infecting with the COVID-19 and scared about COVID-19[5]. Hence, Oncology Health Care Workers (OHCW) are going through a challenging situation of managing the COVID-19 pandemic and cancer at the same time.

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A study among physicians found that they experience moderate to severe perceived stress levels with higher stress levels for females[6]. Different studies were conducted among oncology health care professionals that show an increased level of stress and burnout among professionals working in Oncology, especially medical oncologists, nurses and younger oncologists[7-10]. A review of 14 studies conducted among health care workers during the early phase of the COVID-19 pandemic found a high frequency of psychological symptoms, which needs management[11,12]. Anxiety and depression were associated with concerns about getting infected with the COVID-19 and/or transmitting it to a family member or a patient. Some health care workers expressed their fear about patients' difficulty to get an adequate level of care for chronic non-COVID-19 diseases. Being female, younger age, and having fewer years in clinical practice also were reasons for anxiety[13,14].

Though there are several studies around the world on the stress of health care workers during the COVID-19, no studies seem to be there on the stress and coping among OHCW in India. Therefore, this study aims to understand the perceived stress and coping styles of OHCW during the COVID-19 pandemic in India. The objective of this study is to estimate the prevalence of perceived stress among OHCW and assess the pattern of coping styles in OHCW during the COVID-19 pandemic.

PATIENTS AND METHODS

The study was conducted by the Division of Psycho-Oncology and Division of Clinical Research and Biostatistics of a tertiary cancer centre in the rural part of northern Kerala (India). The study used a cross-sectional design, and no formal sample size calculation was done. Data were collected from September to December 2020 at the hospital, when the COVID-19 cases were in their first peak in Kerala. The study population included all OHCW working in the hospital during the COVID-19 pandemic. All permanent/contract/outsourced staff currently on duty, who were able to read and write English or Malayalam and were willing to participate in the study, were included. Students, interns, and observers were excluded from the study. The study was conducted after getting approval from Institutional Review Board-Scientific Review Committee and Institutional Ethical Committee (1617/IRB-IEC/13/MCC/26-8-2020/4). The study was registered in the Clinical Trial Registry of India (CTRI/2020/09/027908). Perceived Stress Scale (PSS) and Brief-COPE were used to assess the stress and coping style of OHCW, respectively. Separate Google forms and printed forms were prepared to collect data according to their preference following informed consent. Brief-COPE was adapted to Malayalam after the completion of language transformation.

Measures

Socio-demographic questionnaire: the socio-demographic questionnaire included personal questions (gender, age, education, job category, year of hospital experience, marital status, children, staying arrangements, co-morbidities, native district, history of having been COVID-19 positive, and history of COVID-19 contact during the preceding week).

COVID-19 stress rating scale: this expressed the subjective stress reported by a participant due to the COVID-19. COVID-19 related stress was measured using a rating scale from 0 to 10, where 0 is 'no stress' and 10 is 'severe stress'.

Perceived stress scale: "PSS is a self-report tool used to assess the perceived stress in terms of the degree to which situations in one's life are evaluated as stressful". The short form (PSS-10) version is a 10 item questionnaire (six negatively stated and four positively stated). Employing a 5 point Likert scale with scores ranging from 0 (never) to 4 (very often), PSS 10 assesses the person's responses to stress over the preceding four weeks. The global PSS-10 score ranges from 0 to 40, with higher scores indicating higher levels of perceived stress[15].

Brief-COPE: the Brief-Cope was developed by Carver as a short version of the original 60 item COPE scale. This is a 28 item self-report questionnaire designed to measure effective and ineffective ways to cope with a stressful life event. COPE is the abbreviation of 'Coping orientation to problems experienced'. The scale can determine someone's primary coping styles as approach coping or avoidant coping[16].

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences version 20.0 (SPSS Inc., Armonk, NY, USA). We used a per-protocol analysis in this study, analyzing only those participants who completed the questionnaire. Mean, Standard Deviation (SD), Median and Inter Quartile Range (IQR) were used to express the data. Chi-square was used to find out the association. Pearson correlation coefficient was used to observe the relationship between variables. ANOVA and *t*-test were used to find the

significant difference between variables. Statistical significance was considered if $p<0.05$.

RESULTS

The cross-sectional survey questionnaire was given to 570 oncology health care workers in the hospital, meeting the inclusion/ exclusion criteria. Out of that, 282 (49.9%) staff, with their informed consent, filled the questionnaire and participated in the study. The majority of the participants were males (63.8%). Among different job categories, doctors, nurses, and housekeeping staff had higher participation. The mean age of the participants was 38.3±8.8. Half of the participants had five or more years of hospital experience, and more than half (55.7%) of them were permanent staff of the hospital. Sixty three percent of participants were working in their native district. The socio-demographic details of the participants are given in Table 1.

Mean stress due to the COVID-19 was 4.36±3.04 on a rating scale from 0 to 10. Of the 282 participants, 14.9% reported no stress due to the COVID-19. Nearly half (48.6%) of the OHCW reported their COVID-19 stress as 5 or above. The stress related to the COVID-19 was reported more among males. Statistically, significant difference was obtained ($p< 0.001$) on the COVID-19 related stress between males and females. Comparing the COVID-19 related stress among the various age groups by using a Post hoc test showed a statistically significant difference between them ($p=0.001$). The COVID-19 related stress was reported higher among those 30 to 40 years with a mean score of 4.83±2.96. High COVID-19 related stress was reported among front office staff (6.54±3.60) compared to other job categories. These differences showed a statistically significant difference with $p=0.001$. No statistically significant difference was found in the COVID-19 related stress based on native districts of OHCW and years of hospital experience.

On PSS, the mean score was 15.32±5.64, with more than half (59.6%) of them reporting moderate to severe perceived stress (Table 2). There was a statistically significant difference ($p=0.009$) in the age group of OHCW and found higher among 30 to 40 years. A statistically significant difference was noted in gender-wise comparison on perceived stress ($p=0.001$), with higher stress among males. There was no statistical difference among different job categories, native districts or years of hospital experience on PSS. Though not statistically significant, higher stress scores were reported among doctors (17.51±4.44), nurses (17.42±6.00), and those less than ten years of hospital experience. The COVID-19 stress level among the various jobs categories are mentioned in Figure 1.

TABLE 1. Demographic details of the participants.

	n	%
Gender		
Male	180	63.8
Female	102	36.2
Age	38.3±8.8	
20-30 years	59	21.0
30-40 years	125	44.2
40-50 years	67	23.8
50-60 years	31	11.0
Total year of experience	7.1±5.8	
0-2 years	79	28.0
2- 5 years	55	19.5
5-10 years	90	31.9
>10 years	58	20.6
Job category		
Administration	28	9.9
Allied Health Professional	29	10.3
Doctor	41	14.5
Front office/Reception/OPD	28	9.9
House keeping	40	14.2
Nurse	43	15.2
Security staff	28	9.9
Supportive staff	15	5.3
Technician	30	10.6
Job Status		
Permanent	157	55.7
Contract	50	17.7
Outsource	75	26.6
Marital Status		
Married	199	70.6
Single	71	25.2
Divorced/Separated	3	1.1
Widowed	9	3.2
Children		
No children	44	15.6
One child	75	26.6
Two children	132	46.8
More than two children	12	4.3
Not Applicable	19	6.7
Current staying arrangement		
Nuclear	168	59.6
Joint family	70	24.8
Hostel	16	5.7
Staying alone	13	4.6
Sharing	15	5.3
District		
Native district	178	63.1
Outside district	104	36.9
Co-morbidity		
No	247	87.6
Yes	35	12.4
History of COVID-19 contact		
No	184	65.2
Yes	41	14.5
Do not know	57	20.2
Have you been COVID-19 positive		
No	275	97.5
Yes	7	2.5

TABLE 2. COVID-19 related stress and perceived stress based on different variables.

	Covid stress		PSS total score	
	Mean ±SD/ Median(IQR)	p-value	Mean ±SD/ Median(IQR)	p-value
Age		0.009*		0.209
20-30 years	4.4±3.3		15.4±6.9	
30-40 years	4.8±2.9		15.8±5.1	
40-50 years	4.1±3.1		15.1±5.5	
50-60 years	2.8±2.6		13.5±4.8	
Sex				
Male	4.82 ±3.03	0.001*	16.23 ±5.59	0.001*
Female	3.55 ±2.90		13.71±5.39	
Marital status				
Married	4 (2-6)	0.331	16 (11-20)	0.264
Single	5 (2-7)		15 (10-18)	
Divorced/Separated	4 (4-0)		18 (16-10)	
Widow	3 (1-5)		13 (12-18)	
Total year of experience				
0-2 years	4 (2-6)	0.922	16 (11-19)	0.361
2-5 years	4 (1-7)		14 (10-19)	
5-10 years	4.5 (2-6.3)		15.5 (11-19)	
More than 10 years	4 (2-7)		17.5 (12-20)	
Job Category				
Administration	5.1±2.3	0.001*	17.5±4.4	0.001*
Allied Health Professional	3.9±2.9		14.6±5.7	
Doctor	4.6±3.1		15.7±5.3	
Front office/Reception/OPD	6.5±3.6		15.8±4.6	
House keeping	4.4±2.6		14.2±6.0	
Nurse	5.6±3.2		17.4±6.0	
Security staff	1.9±2.2		12.2±4.6	
Supportive staff	2.7±2.3		14.1±5.9	
Technician	2.9±2.1		14.2±6.2	
District				
Native	4.28±3.09	0.578	14.80±5.41	0.045
Outside native	4.49±2.95		16.20±5.94	
History of COVID-19 contact				
Yes	6 (3.5-8)	0.001*	17 (13.5-20)	0.037*
No	4 (1-6)		14 (10-19)	
Do not know	4 (2-6.5)		17 (12.5-20)	
Co-morbidity				
Yes	5 (4-8)	0.007*	18 (13-20)	0.034*
No	4 (2-6)		16 (11-19)	

*p-value statistically significant.

While comparing those with a history of COVID-19 patient contact and not having contact, there was a statistically significant difference on COVID-19 related stress (p=0.001) and PSS (p=0.037). Similarly, a significant difference was found between those having and not having any co-morbidity on COVID-19 related stress (p=0.007) and PSS (p=0.034).

A significant positive correlation (r=0.347) was found between stress due to the COVID-19 and perceived stress. The COVID-19 related stress (r=0.184) and PSS total score (r=0.130) showed a positive correlation with age.

On the Brief-COPE scale, the mean score of Approach coping was 35.58 and of Avoidance coping was 24.26.

DISCUSSION

The role of health care workers is vital in our society, and the need massively increased due to the COVID-19 pandemic. Oncology health care workers had to work a lot as they had to deal with the patients of a chronic disease during COVID-19. This study aimed to understand the COVID-19 related stress and perceived stress on OHCW during this pandemic and its association with demographic factors.

The study was conducted when the COVID-19 pandemic first wave was at its peak in the State of Kerala (India). In our study, it was found that nearly half of the participants had a significant

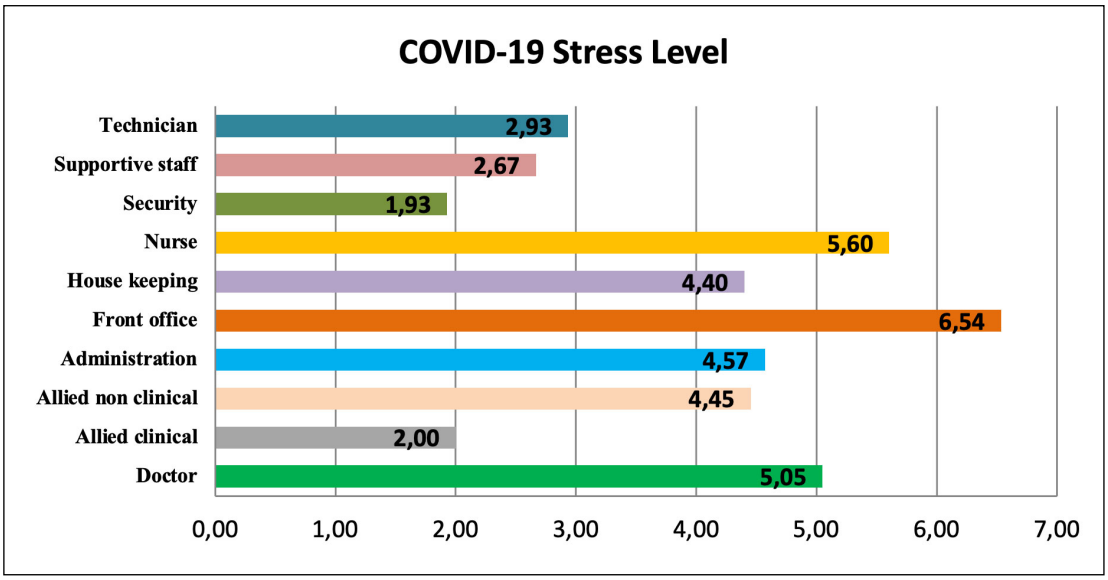

Fig. 1. COVID-19 stress level of different job categories.

level of stress (5 and above) about COVID-19. More than half of the OHCW had moderate to severe perceived stress. Findings also suggest an increase in COVID-19 related stress in those who have increased perceived stress and vice versa. The finding is in line with the study at Suez Canal University, where they found a moderate level of distress among medical and non-medical health workers[17]. A study from Wuhan also reported that 71.5% had distress during COVID-19[18]. The study from Pakistan among the health workers of the tertiary cardiac centre reported 14.7% of them had moderate to severe stress[19]. This may be due to their increased exposure to virus, increased workload, loss of control, chances of infecting family members, their need to be isolated and changes in work due to the COVID-19[17,18,20].

In our study, there was a significant difference found in perceived stress and COVID-19 related stress between genders: males were found to have more stress than females. This result was contradictory to the finding of previous studies from other countries reported as women are more stressed[2,18,21]. Interestingly, similar results were obtained from India, reporting that males had high stress[22]. The reason for contradictory results in the current study may also be due to the lesser number of female participation, compared to male participation, in the study.

Young adults between 30 and 40 years showed significantly higher COVID-19 related stress and perceived stress compared to other age groups. This could be because many of them are more exposed to social media or because several of them feel isolated as they are forced to remain disconnected from others[23]. The finding is supported by the study from Russia among those health care workers who were younger than 50 years and had high distress[24]. On the contrary, one study reported no association with COVID-19 stress and age of the health care worker[25]. A study from China reported greater stress in medical staff between the age of 30 and 50 as they are worried about spreading the virus to their families. This may be about spreading the infection to young children or older parents living with them[26].

COVID-19 related stress score and perceived stress seemed to have a positive association with age. The stress during the COVID-19 among OHCW increased with their age. Karasu et al[27] report that the state of anxiety among health workers increased with an increase of age. The trait anxiety was higher among those above 45 years of age[27]. Stress in elderly staff could be due to their increased exhaustion in work, anxiety about personal safety, and awareness about increased mortality among the aged, especially if they had associated co-morbidities with the increase of age[26].

In our study it was found that those with any co-morbidity had high stress on the COVID-19 stress rating scale and the PSS. The reviews and reports of the COVID-19 severity and mortality among those with co-morbidities are published, which can cause psychological concerns among participants[28]. Consistent with our findings, another study also reported higher stress, anxiety and depression symptoms exhibited by individuals with pre-existing conditions like diabetes, asthma and coronary heart disease than by those who did not have such conditions[29]. Those who had contact or were unsure about the COVID-19 contact were reported to have high stress. This could be due

to the anxiety concerning high chances of getting infected with the COVID-19 due to their exposure with those infected with the COVID-19. The unequal number of participants in each group may have to be considered before generalizing.

Among different job categories of OHCW, front office staff reported higher COVID-19 related stress than other staff. This finding is in line with other studies that had reported non-medical staff and front line nurses to have had more serious psychological concerns. Lack of training in the clinical area, and chances of interaction with the COVID-19 suspected patients as part of their work might have caused stress among these staff[30,31]. Though not statistically significant, perceived stress was reported higher among doctors and nurses, and those with lesser hospital experience. This may be the general perceived stress experienced by the clinical staff in an oncology centre which may be precipitated duringthe COVID-19. Similar results were reported from India that doctors and nurses have had high anxiety, with a greater level of irritability. Interacting directly with several patients, better knowledge about the disease, personal safety and safety of families, and work overload could be some of the reasons for high stress among them. This study also reports higher psychological concerns among those with lower service years at the hospital[26,32,33].

A major finding was the way OHCW coped with the stress had to face. Finding from Brief-COPE shows that a majority of the participants used approach coping methods to deal with stress. The subscales of approach coping include active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support. Those with approach coping may have had better responses to adversity, found practical methods to deal with the problem, better physical health and emotional outcomes[34]. It is observed that the OHCW in the study used these approach methods with high scores on items such as "*I've been taking action to try to make the situation better", "I've been looking for something good in what is happening", "I've been accepting the reality of the fact that it has happened", "I've been learning to live with it", "I've been thinking hard about what steps to take"*. This finding informed us that though OHCW are stressed, adequate coping strategies may have helped them deal with the situation.

Actions were taken assuming the mental health burden on OHCW during this pandemic in the hospital. Adequate knowledge about the pandemic and preventive measures was imparted, and sessions on stress management were conducted for the staff. Many online programs for entertainment were conducted under the staff welfare committee to make them relax during the pandemic. The distribution of vaccines to all health care workers also might have reduced their stress due to COVID-19.

Future research should focus on the intervention strategies to manage the stress among health care workers, especially those working in tertiary care centres. Finding the efficacy of such intervention methods can help us use it universally and prevent burnout at any stressful situations in health care or in life.

The study has its limitations. The study sample was small and not equally distributed among genders, different age groups and different jobs categories. The cause of their stress and specific COVID-19 related concerns were not explored.

CONCLUSIONS

OHCW are found to have moderate to high stress during the COVID-19 pandemic period. While front office staff reported high COVID-19 related stress, doctors and nurses had higher perceived stress. Those between 30 and 40 years were also found to have had high stress. The positive finding is that most of the OHCW used approach coping strategies to deal with the stress. Advanced policies and stress management skill training tailoring the needs of all health care workers may help to manage further tear and wear in the mental health.

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Conflict of Interests:

The Authors declare that they have no conflict ofinterest.

Declaration of Participant consent:

The authors declare that appropriate consent forms were obtained from all participants. In the form, the participant(s) has given his/her consent for his/her information to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity.

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