

## The Psychological Impact of COVID-19 Pandemic on Health Care Workers in the Andaman and Nicobar Islands

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### ABSTRACT

The novel coronavirus disease pandemic has greatly compromised the physical, psychological and social lives of every single individual today. Healthcare workers (HCWs) have been instrumental in containing and alleviating the spread of the disease, risking their own lives as well as that of their families in this process. They face unprecedented stress and pressure at their workplace dealing with COVID-19 patients. The aim of this study was to assess the impact of the COVID-19 pandemic on the mental health of HCWs in a remote island. We devised a questionnaire to measure anxiety and depression levels using the Patient Health Questionnaire (PHQ-4), HCW's feelings towards their jobs, perceived stressors and motivational factors to encourage continuation of work in future outbreaks. Additionally, the Brief Resilience Scale was used to evaluate the levels of resilience in HCWs. A total of 143 HCWs working in a hospital / clinic setting from across the Andaman and Nicobar Islands responded to the questionnaire. Out of 143 responses, 27.97% respondents showed signs of clinically significant anxiety and 30.07% of clinically significant depression as per the PHQ-4. Women reported higher symptoms of anxiety while men reported higher depressive symptoms that require treatment and management. Laboratory staff and paramedics reported highest symptoms of anxiety and depression, while doctors reported the least. Resilience was highest in doctors and lowest in lab staff as per the BRS. Women were found to be more resilient than men with mean scores of 3.26 and 3.15 respectively. Further, remoteness of the islands was the fourth most stressful factor, the first three being fear of spreading the disease to friends and family, increasing number of positive cases and lack of a vaccine.

**Keywords:** COVID-19, Pandemic, Mental Health, Health Care Workers, Frontline Warriors, Andaman and Nicobar Islands

The World Health Organization (WHO) declared the COVID-19 outbreak to be a 'pandemic' on 11<sup>th</sup> March 2020. WHO Director-General remarked that the world had previously never seen a pandemic sparked by a coronavirus before.<sup>1</sup> As of 6<sup>th</sup> May 2021, the WHO reported 155,506,494 cases of COVID-19 globally, with 3,247,228 fatalities.<sup>2</sup> The disease has significantly ruptured individuals' physical, psychological and

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social sense of well-being, leading to high levels of psychological distress.<sup>3 4 5 6</sup> Frontline workers during the pandemic are being subjected to high risk situations, such as dealing with highly infective COVID-19 patients directly. The high transmissibility of the novel coronavirus (SARS-CoV-2) has led to an overburdening of healthcare systems globally. Healthcare workers (HCWs) are forced to work overtime due to the overwhelming number of new cases. They deal with immense stress and burnout due to various factors ranging from lack of proper protective gear at the workplace, watching their colleagues succumb to the disease, social stigma due to the nature of their job and fear of infecting their family members with the virus.<sup>6 7</sup> Additionally, the isolation due to the remoteness of the islands is another stressful factor unique to HCWs on an island.

A literature review revealed previous studies conducted on the same premise. Wilson et al. (2020) investigated the prevalence of stress, anxiety and depression in healthcare professionals of India using Cohen's perceived stress scale, GAD-7 and PHQ-9 respectively. They conducted an online survey in April 2020 amongst 350 healthcare professionals who were directly involved in the screening, diagnosing and the treatment of COVID-19 patients. The prevalence of high-level stress was found to be 3.7%, depressive symptoms was 11.4% and anxiety was 17.7%. It was also found that women were twice as prone to develop stress, depression and anxiety symptoms (Wilson et al. 2020).<sup>3</sup> Similarly, Tan et al. (2020) examined the psychological distress, anxiety, depression and stress that was experienced by healthcare workers in Singapore during the COVID-19 pandemic.<sup>4</sup> They attempted to compare medical and non-medically trained hospital personnel on these parameters using the Depression, Anxiety and Stress Scales (DASS-21) and also the Impact of Events Scale-Revised (IES-R) instrument. The findings revealed the prevalence rates for anxiety, depression, stress and PTSD to be 14.5%, 8.9%, 6.6% and 7.7% respectively. Anxiety levels were found to be higher in nonmedical HCWs as compared to the medical personnel.<sup>4</sup> Another such investigation was carried out by Di Tella et al. (2020) in July where they aimed to study the psychological impact of COVID-19 on the healthcare workers in Italy. They collected responses from 145 participants to predict how varying socio-demographic backgrounds such as marital status and gender or gender and age affected levels of depressive symptoms and Posttraumatic Stress Symptoms (PTSS). Unmarried and single women were associated with higher depressive symptoms while women who were older were associated with higher levels of PTSS.<sup>5</sup> These findings underpinned a prior study conducted by Liu et al. (March, 2020) that emphasized the role of gender in predicting symptoms of posttraumatic stress during the COVID-19 pandemic in China's hardest hit areas. Women reported significantly higher symptoms of posttraumatic stress.<sup>8</sup> There have been several studies conducted in this area recently, providing us with some idea on what to expect but no such study has been conducted on a remote island before. The aim of this study was to investigate HCWs' feelings towards their job, perceived stressors, the levels of depression and anxiety, the levels of resilience and motivational factors for continuation of work during future outbreaks in a remote island scenario.

## **METHODOLOGY**

### *Study Setting*

The study was conducted among the HCWs working in various healthcare settings in Andaman and Nicobar Islands. The Andaman and Nicobar Islands is one of the seven union territories of India comprising of 572 islands of which 32 are inhabited. The total population of the islands is 4,27,246 with a female to male sex ratio of 0.87 and literacy rate of 86.6%.

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There are three District Hospitals, four Community Health Centres and 22 Primary Health Centres in the civil and one Armed Forces hospital.

### *Study Design and data collection*

A cross-sectional study was conducted across the Andaman and Nicobar Islands, India from November 2020 to January 2021. An online questionnaire formulated on Google Forms was distributed to medical professionals through WhatsApp groups. Physical copies of the questionnaire were distributed in the largest government hospital of the islands (designated COVID-19 Care Centre) and the HCWs in the Armed Forces. Responses were obtained from doctors, nurses, ward attendants, laboratory staff and allied health care workers such as pharmacists, radiographers, security guards, sanitation workers etc. These were all healthcare workers who were dealing with COVID-19 patients during the first lockdown period in India and the months following it.

### *Study Tools*

A comprehensive self-administered questionnaire was derived and modified from the one used by Khalid et al. during the MERS epidemic in 2014<sup>9</sup>, which in turn was drawn from a questionnaire devised by Lee et al., used during the SARS epidemic in 2003.<sup>10</sup> The questionnaire comprised of 5 sections excluding the socio-demographic details section. The internal consistency coefficient for this questionnaire (Cronbach's  $\alpha$ ) was calculated to be 0.81. The first section consisted of 7 items that brought out HCWs' feelings towards their Job. The respondents had to select either the *Yes* or *No* option for each statement and if they responded with *Yes*, they were further required to state the degree to which they agreed with the statement (*slightly agree [1]*, *moderately agree [2]*, or *agree very much [3]*). The internal consistency for this section (Cronbach's  $\alpha$ ) was 0.43. The next section about Perceived Stressors contained 9 items. The respondents were required to select the option most suited to them on a four-point-scale (*No Stress, Mild Stress, Moderate Stress, and High Stress*). The internal consistency for this section (Cronbach's  $\alpha$ ) was 0.8. The third section comprised of the Patient- Health Questionnaire (PHQ-4) which is a valid, 4-item ultra-brief tool for detecting both depressive and anxiety disorders by Kroenke et al.<sup>11</sup> The results of the PHQ-4 were calculated by totaling the scores of the 4 items. Scores falling within the ranges of 0-2, 3-5, 6-8 and 9-12 were rated as normal, mild, moderate and severe respectively. A score of 3 or above on the first two items suggested clinically significant anxiety while a score of 3 or above for the last two items suggested clinically significant depression. The internal consistency for this section (Cronbach's  $\alpha$ ) was 0.8. The fourth section consisted of 4-items that looked at factors that would motivate HCWs to continue doing the work they did during the COVID-19 pandemic in future outbreaks with internal consistency (Cronbach's  $\alpha$ ) 0.66. The fifth and final section comprised of the Brief Resilience Scale by Smith et al. (2008)<sup>12</sup> - a standardized, valid and ultra-brief 6 item tool used to measure one's level of resilience. Scores within the ranges of 1.00- 2.99, 3.00- 4.30 and 4.31- 5.00 fall under the category of low resilience, normal resilience and high resilience respectively. The internal consistency of BRS in the present study was 0.4.

### *Data Analysis*

The responses were downloaded from Google Forms to Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA, 2016) spreadsheet and coded. The data was interpreted and analyzed. The data is displayed in terms or percentage of people who agreed with a statement and the degree to which they agreed with it. These were reported in terms

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of mean and standard deviation. Results of the PHQ-4 and BRS section were also calculated on Microsoft Excel.

### RESULTS

Out of the 143 participants in the study 67.1% of the respondents were males while 32.9% were females. The sample consisted of 51 doctors, 12 nurses, 31 laboratory staff and diagnostic services, 42 paramedics and 7 auxiliary HCWs like sanitation workers and security guards. The break up is displayed in the socio-demographic table (Table 1.) below.

*Table 1. Sociodemographic characteristics of the study participants*

Variables	Frequency (n= 143)	%
<b>Males</b>	96	67.10
<b>Females</b>	47	32.90
<b>Age</b>		
<b>18-31</b>	71	49.7
<b>31-45</b>	50	35
<b>46-60</b>	15	10.5
<b>60+</b>	7	4.9
<b>Profession</b>		
<b>Doctors</b>	51	35.66
<b>Nurses</b>	12	8.39
<b>Lab staff/ Diagnostic services</b>	31	21.68
<b>Paramedics</b>	42	29.37
<b>Auxiliary</b>	7	4.90
<b>Location</b>		
<b>South Andaman</b>	136	95.10
<b>Other Islands</b>	7	4.90

The results of section one of the questionnaire which explored healthcare workers' Feelings Towards their Job is given in Table 2. 92.31% of the respondents felt that it was their moral duty to go to work every day during the nation-wide lockdown while only 27.97% people considered quitting their job at some point during it. The severity of these feelings can be understood by the average response score.

*Table 2. Feelings towards Job*

<i>Feelings Towards Job</i>	<i>Answered Yes (%)</i>	<i>Average Response Score (SD)</i>
1. You felt it was your moral duty to go to work every day during the nation-wide lockdown.	92.31	2.49 (0.73)
2. You considered quitting your job at some point.	27.97	1.55 (0.68)
3. You expected financial compensation for working during the pandemic.	56.64	1.75 (0.81)
4. You felt that your job was causing people in your neighborhood to avoid you	65.73	1.87 (0.71)
5. You felt stressed because of the nature of your job	69.93	1.78 (0.84)
6. You were provided with sufficient protective gear (PPE, N95 Masks, Sanitizers etc.) in your workplace.	83.92	2.08 (0.77)
7. You were given special recognition in society and treated with respect for your job.	81.82	2.09 (0.83)

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The results for section two of the questionnaire are as reported in Table 3. This section dealt with the major stressors that HCWs on the islands experienced. It should be noted that this section did not attempt to measure their stress levels, but rather it aimed to provide a better understanding of the causal factors behind the psychological distress faced by them.

**Table 3. Perceived Stressors**

PERCEIVED STRESSORS	ANSWERED YES (%)	AVERAGE RESPONSE SCORE (SD)
1. Fear of getting Covid-19 from a patient and falling sick ( <i>caused you stress</i> )	75.52	1.51 (0.59)
2. Fear of spreading Covid-19 to your friends and family	90.21	2.12 (0.83)
3. Having to wear PPE and N95 masks in the hospital/ clinic	70.63	1.92 (0.84)
4. Conflict between your duty and concern for safety	69.23	1.68 (0.78)
5. Seeing sick patients suffering from symptoms of Covid-19	76.22	1.70 (0.79)
6. Lack of a vaccine and cure for Covid-19	84.62	2.05 (0.86)
7. Seeing the increasing number of Covid-19 positive cases	88.11	2.15 (0.79)
8. Social stigma and people treating you differently because of nature of your job.	66.43	1.76 (0.74)
9. Isolation on a remote island with limited support and supplies from the mainland and difficulty referring to mainland.	76.22	2.04 (0.80)

Section three of the questionnaire comprised of the Patient Health Questionnaire (PHQ-4) which is a valid, 4-item ultra-brief tool for detecting both depressive and anxiety disorders by Kroenke et al.<sup>11</sup> The prevalence of clinically significant anxiety and clinically significant depression in the total sample were found to be 27.97% and 30.07% respectively. 32.17% of the sample had PHQ-4 scores within the mild range, 16.08% within the moderate range and 8.39% were in the category of severe. (See Table 4)

Further, scores were extrapolated and depicted in terms of gender and profession as depicted in Fig. 1 and Fig. 2 respectively.

**Table 4. PHQ Scores**

	N	%
<b>Clinically Significant Anxiety</b>	40	27.97
<b>Clinically Significant Depression</b>	43	30.07
<b>Mild Range</b>	46	32.17
<b>Moderate Range</b>	23	16.08
<b>Severe Range</b>	12	8.39

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Fig. 1 PHQ-4 Results based on Gender

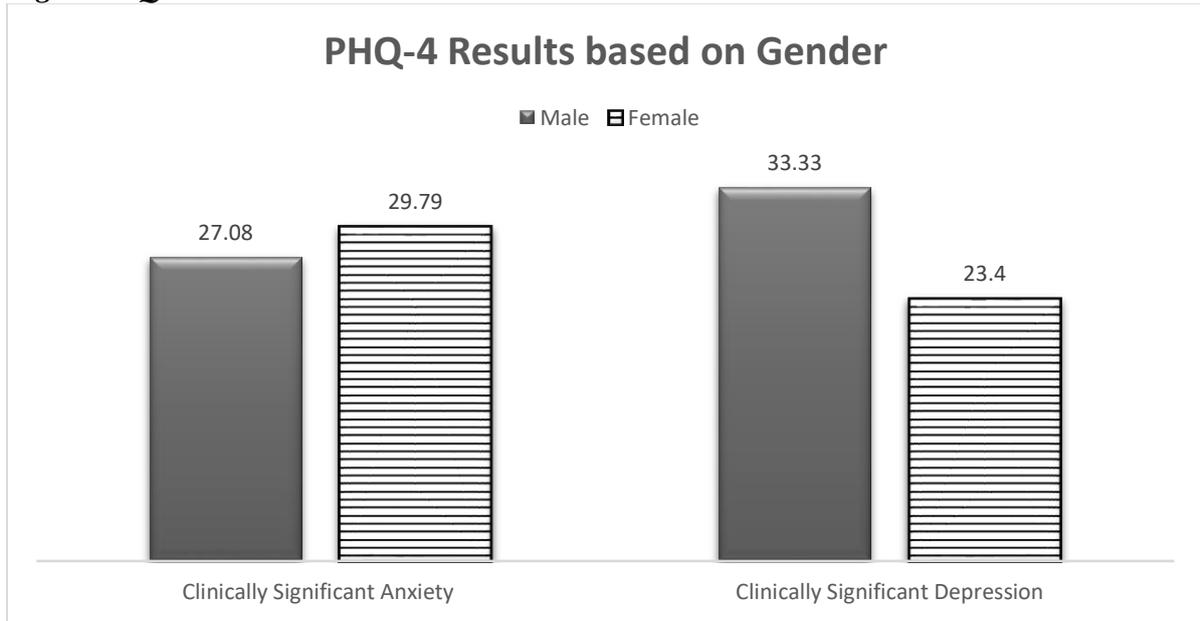
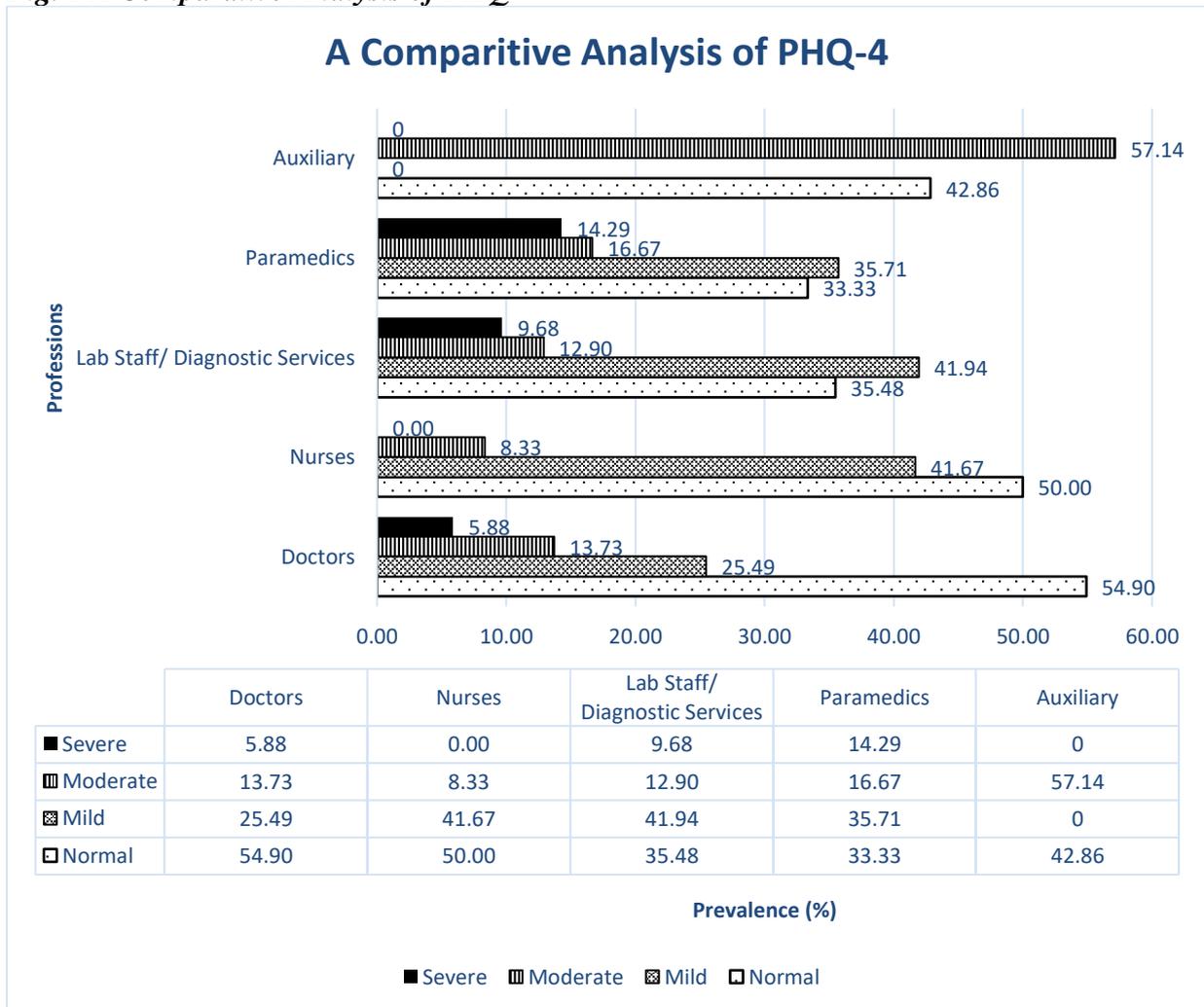


Fig. 2 A Comparative Analysis of PHQ-4



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Section four of the questionnaire explored motivational factors that encouraged HCWs to continue providing their selfless service. Table 5 displays their responses wherein they rated the factors in terms of their importance.

**Table 5. Motivational Factors**

	<b>Motivational Factors to Encourage Continuation of Work in Future Outbreaks</b>	<b>Not At All Important</b>	<b>Slightly Important</b>	<b>Very Important</b>	<b>Most Important</b>
<b>1.</b>	Adequate PPE and Sanitary Protocol provided by the hospital/ workplace.	3.25%	9.76%	36.59%	66.67%
<b>2.</b>	Available cure or vaccine for the disease	1.63%	25.20%	37.40%	52.03%
<b>3.</b>	Compensation to family for any death/ disability related to work	6.50%	14.63%	47.15%	47.97%
<b>4.</b>	Financial compensation for working during a pandemic.	25.20%	26.83%	26.83%	37.40%

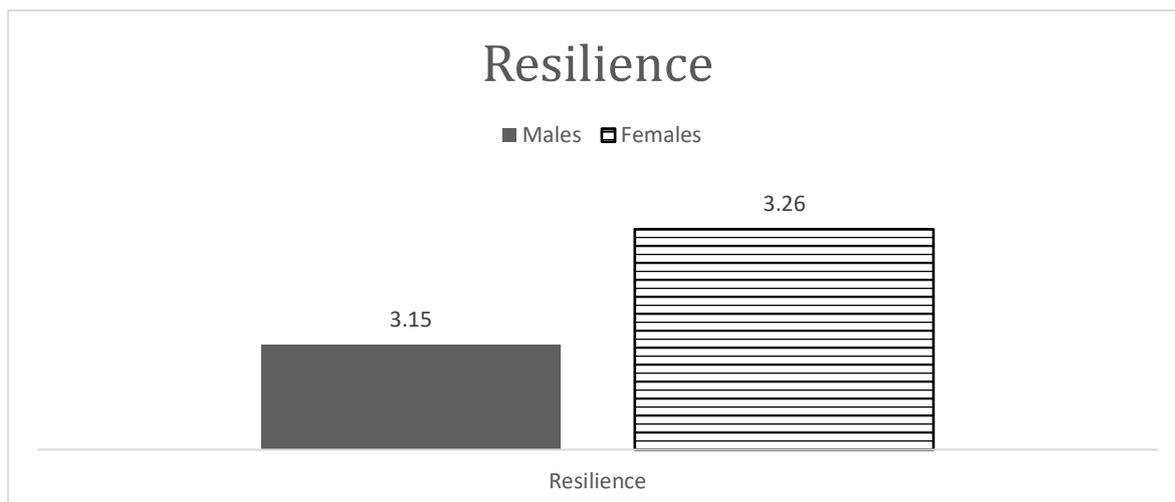
Section five of the questionnaire consisted of the Brief Resilience Scale developed by Smith et al. (2008).<sup>12</sup> It is a standardized, valid and ultra-brief 6 item tool used to measure one's level of resilience. Table 6 displays the data collected. Average resilience levels were calculated for each gender and professions as depicted in Figures 3 and 4 respectively.

**Table 6. BRS Scores**

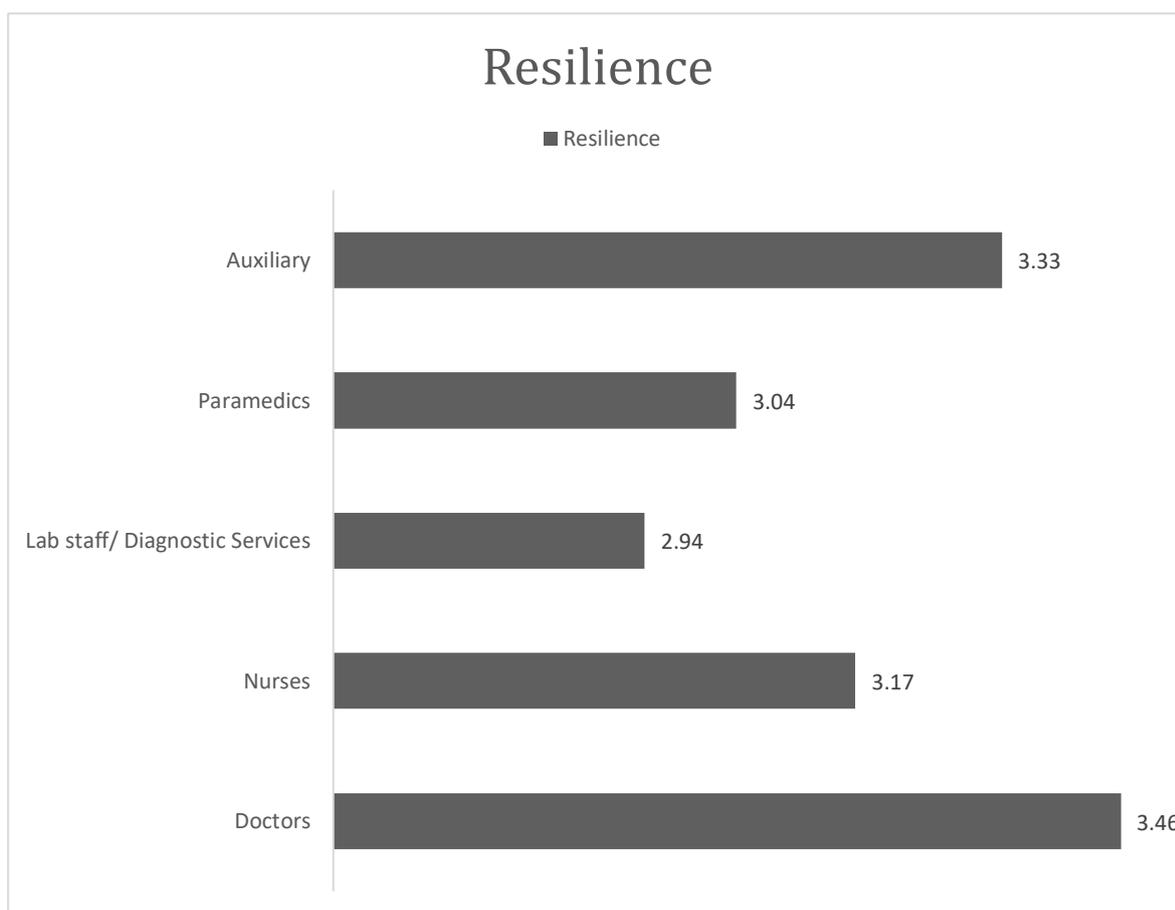
<b>Category</b>	<b>Mean (SD)</b>
<b>Male</b>	3.15 (0.63)
<b>Female</b>	3.26 (0.67)
<b>Doctors</b>	3.46 (0.71)
<b>Nurses</b>	3.17 (0.45)
<b>Lab Staff/ Diagnostic Services</b>	2.94 (0.53)
<b>Paramedics</b>	3.04 (0.60)
<b>Auxiliary</b>	3.33 (0.44)

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**Fig. 3 Resilience**



**Fig. 4 Resilience**



### **DISCUSSION**

Healthcare workers undeniably play a very important role in society in general. However, during an outbreak, their role is absolutely vital in containing the spread of the disease and alleviating the suffering of those who succumb to it. During the COVID-19 pandemic, HCWs often selflessly cut themselves off from their friends and families in order to keep

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them safe.<sup>13</sup> Already faced by multiple challenges and a tremendous amount of stress,<sup>5 6 14</sup> this isolation from loved ones is a huge sacrifice HCWs make for the safety of humanity and the welfare of society.<sup>13</sup> Studies have shown that such isolation results in higher risk of psychological abnormalities among HCWs.<sup>6 15 16 17</sup> The present study aimed not only to measure their levels of distress but also to understand the underlying factors that caused it. 92.31% of the respondents felt that it was their moral duty to go to work every day during the nation-wide lockdown, while only about 27.97% of the respondents considered quitting their job at some point during the pandemic. This shows how committed they were to their profession, regularly putting themselves in high-risk situations. Such dedication and professionalism has been exhibited by HCWs globally during the current pandemic and also during previous outbreaks.<sup>18 19 20</sup> 65.73% of the respondents felt that their job was causing people in the neighborhood to avoid them, yet 81.82% of the sample believed that they were given special recognition in society and were treated with respect for their job. This is corroborated by the fact that the social stigma of the job was not considered to be a high-level stressor by the respondents in the perceived stressors section of the questionnaire. In fact, the social stigma factor of the job was considered to be a stressor by only 66.43% of the HCWs, making it the least stressful factor. The biggest stressor for most HCWs was the fear of spreading COVID-19 to their friends and loved ones, with 90.21% of the respondents citing it as a significant stressor as compared to the 75.52% of HCWs who were afraid of catching the disease from a patient and falling sick themselves. Also, it should be noted that the average response score (which indicates the severity of a stressor) was 2.12 for the former and only 1.51 for the latter. A study conducted by Dai, Y. et al. (2020) amongst the HCWs in China revealed similar results wherein respondents were nearly twice as worried about infecting their loved ones as compared to self-infection.<sup>6</sup> Conflict between duty and concern for personal safety was the second lowest ranked stressor at 69.23%. Lack of a vaccine and cure for COVID-19 and seeing sick patients suffering were both high level stressors. This study was conducted prior to the distribution of any of the known COVID-19 vaccines. The mass distribution of vaccines began in early December 2020.<sup>21</sup> Thus, it is important to continue the present study to understand the exact impact of the availability of vaccines on HCWs. Interestingly, isolation on a remote island with limited support and supplies from the mainland was not considered to be a very high-level stressor by most HCWs with an average score response of 2.04 and 76.22% consensus.

The Patient Health Questionnaire (PHQ-4) used to measure the levels of anxiety and depression revealed 27.97% prevalence of clinically significant anxiety and 30.07% prevalence of clinically significant depression. 32.17% of the sample fell into the 'mild' criteria for potentially developing an anxiety/ depressive disorder. The prevalence of 'moderate' and 'severe' for the same was 16.08% and 8.39% respectively. Further, the scores extracted were analyzed based on gender and profession. Women were more prone to clinically significant anxiety symptoms at 29.79% prevalence as compared to men at 27.08%. However, the prevalence of clinically significant depression was found to be higher in males at 33.33% while only 23.4% for women. Paramedics were at highest risk for developing severe anxiety/ depression at 14.29% prevalence. Laboratory staff and Diagnostic services were at second highest risk at 9.68 % prevalence while doctors had 5.88% prevalence for the same. Nurses, and auxiliary HCWs were not at severe risk. 45.1 % doctors reported symptoms of anxiety or depression ranging from mild to severe while 64.52% laboratory staff and diagnostic services reported symptoms of the same. This is corroborated by the fact that the average score for doctors on the Brief Resilience scale (BRS) was the highest at 3.46 (normal resilience) and lowest for laboratory staff and

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diagnostic services at 2.94 (low resilience). The BRS measures one's ability to bounce back after a stressful time. The average resilience for paramedics, nurses and auxiliary staff were 3.04, 3.17 and 3.33 respectively. A study by Guo, J. et al. (2020) shows similar results where nurses and other medical staff were more likely to have anxiety and depression as compared to doctors.<sup>22</sup> This supports a study by Tan et al. (2020) that examined the psychological distress, anxiety, depression and stress that was experienced by healthcare workers in Singapore during the COVID-19 pandemic. They attempted to compare medical and non-medically trained hospital personnel on these parameters using the Depression, Anxiety and Stress Scales (DASS-21) and also the Impact of Events Scale- Revised (IES-R) instrument. Anxiety levels were found to be higher in nonmedical HCWs as compared to the medical personnel.<sup>4</sup>

When it came to motivational factors, Adequate PPE and Sanitary Protocol provided by the hospital or workplace was rated as the most important factor followed by an available cure or vaccine for the disease. Financial compensation was the lowest ranking motivational factor to ensure continuation of work in future outbreaks. As the Director General of the World Health Organization, Dr. Tedros Adhanom Ghebreyesus said, "No country, hospital or clinic can keep its patients safe unless it keeps its health workers safe."<sup>23</sup> It is of utmost importance to ensure that healthcare workers are well looked after, and that their mental and physical health is prioritized. There is a significant association between the psychological outcome and physical symptoms amongst HCWs since the outbreak (Chew et al.).<sup>18</sup> Our study attempted to highlight the causal factors of their mental distress in the hopes of addressing and ameliorating them in the future.

This study has a few limitations. First, the questionnaire was self-administered and respondents could change their answers in order to make them more socially desirable. To minimise this, the forms remained anonymous and filling out their phone numbers and email addresses was optional. Second, the study was conducted from November 2020 to January 2021, a few months after the lockdown period and the global panic. This may have led to recall bias in the participants while answering the questionnaire. Third, this study was conducted prior to the catastrophic second wave ravaging India presently and prior to the mass inoculation programme for HCWs undertaken by the Government of India. A new study must be conducted in order to establish the impact of the availability of vaccines and the exponential rise in the number of cases and fatalities on the levels of psychological distress faced by healthcare workers now. Additionally, due to small sample size, the differences between the variables were found to be insignificant.

### CONCLUSION

During the COVID-19 pandemic, HCWs were subjected to high stress levels. The relative levels of anxiety, depression, stress and resilience varied greatly amongst different socio-demographic variables like gender, profession and age. Additionally, it was found that isolation and remoteness due to living on an island was not a high-level stressor for HCWs. The findings of this study revealed that the most stress-inducing factor for HCWs was the fear of spreading COVID-19 to their friends and family. It is critical that healthcare workers be provided with appropriate support and interventions at the workplace so as to reduce their psychological distress.

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### **Conflict of Interest**

The author(s) declared no conflict of interest.

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