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Original Research Article

Behaviour, services and their future estimation towards nCOVID-19 patients in different waves of health care workers

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ABSTRACT

Background: Health care workers (HCWs) presented frequent concerns regarding their health and their families health and high levels of psychological distress during nCOVID19 pandemic, we aimed to estimate towards the future services nCOVID-19 waves like 4th wave in India and their behavior, and services towards the nCOVID-19 Patients and whether HCWs are in more depression or anxiety level.
Methods: We developed a questionnaire to study the HCWs. The questionnaire demography and data anxiety, depression behavior consists of 30 questions.
Results: high-risk health care workers had elevated stress levels. We sent 200 questionnaires completed questionnaires were returned by 128 (64%) of the participants. Out of which 72 (36%) are incomplete or non-response data. Maximum age is from 30-35 male and 25-30, female age group. Highest number of male age groups from 30 to 35, 25 (37.31%), in case of female age groups from 25-30, 19 (31.15%). Overall, the number of Male 67 (52.34%) and female 61 (47.65%) of the study. From the above descriptive statistics gives that overall average age of female with standard deviation (29.98±6.38), and with overall male, average and standard deviation (32.27±6.60). Median age of female is 27 and Male is 30 years of age. By using the linear regression analysis, we predict the future behaviors and services for upcoming pandemic is very less anxiety and depression with ($p<0.001$) significant.
Conclusions: In conclusion, our study highlights that HCWs are both female and male are predicted less depression and anxiety about the behavior and future pandemic services.

Keywords: Health care workers (HCWs), stress, nCOVID-19, Linear Regression, SPSS 22.0

INTRODUCTION

Infectious disease outbreaks have become a global health imperative. This virus may allow the exchange of genetic material and create potential to trigger a serious pandemic. History tells us that protection against a viral pandemic. Increasingly, health care workers and providers find themselves on the front line of disasters and public health emergencies. The outbreak demonstrated not only the economic and social costs of serious infectious diseases but also the human costs, particularly to health care workers and providers and their families. As the world prepares and plans for a pandemic there is a growing sense of urgency regarding the need to develop and implement plans and strategies that will help protect health care workers and providers and, ultimately, increase the capacity of the health sector to respond to

such a public health emergency? Coronavirus disease 2019 (abbreviated "COVID- 19") is an emerging respiratory disease that is caused by a novel coronavirus and was first detected in December 2019 in Wuhan, China. In response to this serious situation, the world health organization (WHO) declared it a public health emergency of international concern on January 30 and called for collaborative efforts of all countries to prevent the rapid spread of COVID-19.[1-3] The courage of health care providers during the nCOVID-19 outbreak did not make them immune to anxiety or stress, despite the fact that, at the time of the outbreak, the stress levels of high-risk workers did not appear to differ from those of the community. In December 2019, the world health organization (WHO) declared a pandemic. The firs-t pandemic in the 21st century, when sustained community spread of nCOVID-19 occurred in multiple WHO regions.[13]

Pandemic has become one of the central health crises of the generation. The pandemic has affected people of all nations, continents, races, and socioeconomic groups. There is global recognition of the need for comprehensive planning and capacity building in anticipation of a pandemic such as the anticipated influenza or flu pandemic.[1] As a result there has been significant investment of resources into pandemic planning throughout health sectors. The resilience and well-being of health care workers and providers is a critical component of health service delivery, surge capacity and pandemic response capacity.[2] Provide a planning framework for the development of workforce resiliency programs and support strategies to address the psychological and social (psychosocial) needs of health care workers and providers.[4] The stress, the ongoing uncertainty of the event, and the threat or actual loss of family members, friends and colleagues may cause unusual emotional strain and contribute to or exacerbate pre-existing psychological disorders (e.g., depression, anxiety, and complicated grief). Stress has long been identified as a determinant of health and well-being tied to employment issues (e.g., job performance, absenteeism, job satisfaction and willingness to work), physical health (e.g., hypertension, cardiovascular disease) and mental health (e.g., depression, anxiety, substance abuse).[1] Experience and research also suggest that the psychological impact of response on responders can be significant, with lasting mental and physical health consequences and may result in a complex and not always successful adaptation process (van der Kolk et al., 2005).[3-5] Immense patient loads, coupled with shortages of health care workers (including physicians, nurses, pharmacists) and medical supplies placed enormous demands on those who were working; in fact, many endangered their own health in order to meet the demands of care. During the SARS epidemic, health care providers reported experiencing high levels of stress and distress related to; risk of infection; intense and highly stressful working conditions, including having to work while wearing protective equipment; balancing work demands with family concerns about infection; and longer hours and extended shifts.[7,8] The factors influencing workforce motivation are complex, involving a web of individual, organizational and socio-cultural dimensions and factors.[9] The main outcome measure is non-specific psychological distress, it has been used in population health surveys, as well as in National surveys conducted by the Australian bureau of statistics. Many HCWs presented high levels of psychological distress, frequent concerns regarding their health and their families' health, worries about their functional ability and fears of stigmatization. HCWs worries and psychological distress over the previous SARS outbreak have been associated with higher job stress, social isolation and health fears.[5-10] Identifying factors in the health care environment that may be associated with HCW worries and psychological distress regarding infectious disease outbreaks and understanding their role in motivating HCWs to engage or to avoid their duties may help to provide HCWs with the most favorable working conditions possible in times of extreme distress.[6] Vaccine development and research into medical treatment for COVID-19 somehow relaxation of depression and stress of the HCWs. Meanwhile, the pressure on the global health care workforce continues to intensify. Overwhelming burden of illnesses that stresses health system capacity, and the adverse effects on health care workers, including the risk of infection.[9-12] No studies, however, have investigated HCWs' worries, concerns or psychological distress at future services and behaviors for upcoming pandemic at the height of the epidemic of the new strain of nCOVID-19 and their future estimations of the depression and anxiety and interest to provide the services happily or by taking high stress. Prompted by this fact, the aim of the present study was to estimation or prediction of 4th wave and more and their response to nCOVID-19 provide by their degree of concerns and worries over the pandemic, their degree of perceived sufficiency of information concerning nCOVID-19, their intended behavior during the pandemic and its associated psychological distress, anxiety.

Objectives

Healthcare workers are at high risk during a pandemic so the objectives of current study were; to explore the depression and anxiety and their future outcomes for any more waves, who worked during nCOVID-19 in the hospitals and to assess the base line study as the 1st and 2nd wave and their future stress and anxiety, who were at high risk of exposure during nCOVID-19.

METHODS

Study design, location and duration

Current study is a web based cross-sectional study design conducted on health care workers of nCOVID-19 at Hi-tech Medical College and Hospital from 1 June 2022 to 30th July 2022 nCOVID -19 outbreak that occurred in Odisha.

Inclusion and exclusion criteria

The study subjects included all the participants who worked as a heath care worker in the Hitech covid hospital, after the fill up the questionnaire with relevant inform we taken as a sample of observation, otherwise not filled the questionnaire properly and send we considered as the exclusion criteria.

Sample size

Out of 220 HCWs in the Hitech COVID Hospital, we send the 200 questionnaire with a response of 140 sample out of which 12 are missing information, according to Adam A.M. at 95% confidence level and 5% margin of error the sample size required for the study is 128.[13-18] So we have the exact number of the sample 128. This study was conducted tertiary COVID care hospital of hi-tech medical college and hospital in Odisha. Team of health workers or nCOVID-19 health care providers were invited to participate and provided during the period of their services. The questionnaire sent to the mail id that we collected from after taking the concern through phone or personal meet. Then the data collected through e-mail enter into the MS-Excel 2010 and analysis was done through the statistical software IBM SPSS ver. 22.0.

Statistical analysis

Frequency distribution and descriptive statistics are presented. Chi-square tests were used for analysis of the categorical variables and Linear Regression for predicting the future services and behaviors of HCWs. All statistical analysis were performed using SPSS for windows ver. 22.0 (SPSS, Chicago, IL, USA), and the level of significance was set at 5%.

RESULTS

We sent 200 questionnaires to the COVID-19 health care provider of different nCOVID-19 treatment hospitals, out of 128 response 12 (6%) are incomplete data, 128 response rate of 64% were completed and returned, giving a response rate of 64%. It is observed from (Table 1, Figure 1) that the maximum age ranged from 30-35 in males and 25-30 in females.

Table 1: Descriptive statistics of age and sex distributions.

Sex	N	Minimum	Maximum	Mean	Median	SD
Female	61	23.00	44.00	29.59	27.0	6.61
Male	67	23.00	52.00	30.99	30.0	6.12

Table 2: Model summary.

Model	R	R Square	Adjusted R Square	Std. error of the estimate
1	0.740[a]	0.547	0.540	0.81403

[a]Predictors: (Constant), wave3, wave2.

Table 3: ANOVA analysis[a].

Model		Sum of Squares	Df	Mean Square	F	Significance
1	Regression	100.138	2	50.069	75.560	0.001[b]
	Residual	82.830	125	0.663		
	Total	182.969	127			

[a]Dependent Variable: wave1, [b]Predictors: (Constant), wave3, wave2.

Table 4: Regression analysis summary for wave 1 predicting the HCP of wave 2 and wave 3.

Variables	B	95%CI	Beta	T statistic	P value
Constant	0.650	0.18-1.17	-	2.757	0.007
Wave 2	0.783	0.65-0.91	0.739	12.249	0.001
Wave 3	0.011	-0.08-0.10	0.014	0.229	0.819

Highest number of male age groups from 30 to 35, 25 (37.31%) followed by the 25-30 age group, 24 (35.82%), in case of female age groups from 25-30, 19 (31.15%) followed by the female age group below 25 i.e., 18 (29.51%). And minimum number of from age group of males above 40 and below 25, i.e., 5 (7.46%) but in case of female minimum number of age group 35-40, 3 (4.92%). Overall, the number of Male 67 (52.34%) and female 61 (47.65%) of the study. From the above descriptive statistics gives that overall average age of female with standard deviation (29.98±6.38), and with overall male, average and standard deviation (32.27±6.60). Median age group in case of female is 27 and median age group of Male is 30 years of age. H_0: Behaviors and future services in all waves of nCOVID-19 is increase. H_1: Behaviors, and future services in estimated waves of nCOVID-19 is decline.

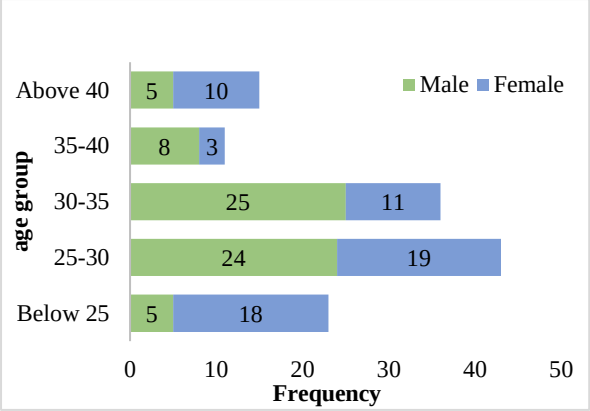

Figure 1: Age and sex wise distribution of study subject.

It is observed that both the independent variables (wave 2 and wave 3) reveal in the model account for 54.0% variance in the dependent variable wave 1 (Table 2). R is the correlation (74%) between the regression predictor (wave1) values and the actual values. For linear regression, R is equal to the correlation between the predictor and dependent variable. R square the squared correlation indicates the proportion of variance in the dependent variable that's accounted for by the predictor (s) in our sample data. Adjusted R-square estimated R-square when applying our sample-based regression equation to the entire population. The regression coefficients and their significance and the OLS ordinary least squares (OLS) equation for wave 1= 0.650+0.783 (wave 2) +0.011 (wave 3) is observed in (Table 4). We can also conclude from (Table 4) that the Z scores or the standardization form of the OLS variables equation Z wave 1=0.739 (Z wave 2) +0.014 (Z wave 3).

Table 5: Model summary.

Sex	R	R Square	Adjusted R Square	Std. error of the estimate
Female	0.666[a]	0.443	0.424	0.95281
Male	0.833[a]	0.693	0.683	0.64409

[a]Predictors: (constant), wave 3, wave 2.

Table 6: ANOVA analysis[a].

Sex		Sum of Squares	Df	Mean Square	F	Significance
Female	Regression	41.902	2	20.951	23.077	0.001[b]
	Residual	52.656	58	0.908		
	Total	94.557	60	-		
Male	Regression	59.957	2	29.978	72.263	0.001[b]
	Residual	26.551	64	0.415		
	Total	86.507	66	-		

[a]Dependent Variable: wave1, [b]Predictors: (Constant), wave3, wave2.

Table 7: Regression analysis summary for wave 1 predicting the HCW of wave 2 and wave 3.

Sex	Variable	B	95%CI	Beta	T value	P value
Female	Constant	0.704	-0.065-1.47	-	1.833	0.072
	Wave 2	0.725	0.507-0.943	0.654	6.652	0.001
	Wave 3	0.065	-0.097 -0.227	0.079	0.807	0.423
Male	Constant	0.578	0.041 -1.115	-	2.152	0.035
	Wave 2	0.836	0.697 -0.975	0.833	12.022	0.001
	Wave 3	-0.031	-0.141 -0.079	-0.040	-0.570	0.570

The p value for beta coefficient of wave 2 is 0.001. Significant, and the wave 2 is 0.819 is not significant thus we accept the null hypothesis at 5% sig level, we can claim that the wave 1 and wave 2 is not positively related to the waves 3. That mean in the above equation or prediction equation are the b or unstandardized regression. To predict the anxiety, depression, stress, we need to only plug into the wave 1 and wave 2. It is observed from model summary that both the independent variables (females and males) also give the R values for overall fit of the model (Table 5). The adjusted R square value in case 42.4% and 68.3% account for female and male. Two independent variables account for 42.4% and 68.3% variance in the dependent variable i.e., wave 1. The effect size both the model male and female i.e., moderate effect size in case male and low effect size in case of female. R is the correlation between the regression predictor (female and male) values. For linear regression, R is equal to the correlation between the predictor and dependent variable. ANOVA: Female; F (2, 58) =23.077, p=0.001, ANOVA: Male; F (2, 64)=72.263, p=0.001. It can be bserved from (Table 6) that the significance value both female and male (p<0.001), which below the level of significance 0.05 and therefore, there is a statistically significant difference between the group mean. ANOVA shows increase in the depression

behaviors and anxiety during the nCOVID-19 epidemic and females are experiencing more severe anxiety and depression symptoms than male. The coefficient values and analysis mentioned in (Table 7) can be useful to predict future services, behaviors of the HCW in a future pandemic. Waves-Female (1) =0.704+0.725 (Waves 2)+0.065 (Waves 3); Waves-Male (1)=0.578+0.836 (Waves 2)+-0.031(Waves 3). From the regression equation it can be predicted the next wave for future services of pandemic. Regression analysis (Table 7) gives the gender wise depression and anxiety among the health care workers shows that females are more depression than the males HCWs.

DISCUSSION

In this study, we found that a significant proportion of health care workers respondents reported an increase in workload as a result of the nCOVID-19 Pandemic, the 3rd wave than the 1st wave. The majority of HCWs (100%) who responded to the survey reported that they had always worn a mask and taking proper precaution during consultations.

In this paper the difference in perceived stress between the high- and low-risk health care workers was mediated by the IES-R.[14] scores measuring posttraumatic stress owing to the impact of the SARS outbreak. Despite the reported use of guidelines by healthcare workers, a significant proportion continued to state the need for more training in dealing with nCOVID-19 pandemic. With regard to assuming public health responsibilities. We could speculate that this is due to the more standardized instructions or supervision among HCW who work in the same organization as compared to HCW who work in private settings who may work solo or work in small groups. In this paper to Improving surveillance of the impact of COVID-19 by occupation and industry will benefit not only HCWs but all workers during the COVID-19 pandemic.[15-17] In this paper the Maximum age are from 30-35 male and 25-30, female age group. Highest number of male age groups from 30 to 35, 25(37.31%). Maximum age are from 30-35 for male and 25-30 for female age group. Highest number of male age groups from 30 to 35, 25(37.31%), in case of female age groups from 25-30, 19 (31.15%). Along with the Median age of female is 27 and male is 30 years of age. Here we can see that both the independent variables (wave 2 and wave 3) tells us that in the model account for 54.0% variance in the dependent variable wave 1. In this paper a series of hierarchical multiple regression analyses using Baron and Kenny's.[15] In this study we have the ANOVA ($p<0.001$) show the increased the depression behaviors and anxiety during the nCOVID-19 epidemic and females are experiencing more severe anxiety and depression symptoms than male. We perform a Linear regression for prediction for future outcomes of HCWs so the values of coefficients table provide us with the necessary information to predict the future services, behaviors of the HCW in a future pandemic.

Waves-female (1)=0.704+0.725 (Waves 2) +0.065 (Waves 3), waves-male (1)=0.578+0.836 (Waves 2) -0.031 (Waves 3). From the regression equation it was predicted the next wave for future services of pandemic. The regression analysis gives the gender wise depression and anxiety among the health care workers shows that female are more depression than the male HCWs. As the pandemic continues, important clinical and policy strategies are needed to support health care workers. Our study identified the psychological distress and anxiety decrease as the different wave increases. Psychological support could include counseling services and development of support systems among colleagues. The regression analysis also gives the gender wise depression and anxiety among the health care workers shows that females are more depression than the male HCWs.

Limitations

Limitation of current study was small sample size with specified COVID-19 hospital; large scale study would be recommended for more accurate predictions.

CONCLUSION

In this study suggest that stress anxiety and depression an epidemic decline from wave 1 and wave 2 than wave 3. This indicates that stress management for front-line health care workers is integral to a protocol for outbreak preparedness. This would predict and estimated that if any more waves comes then management of stress, anxiety and depression among the HCW is very less impact for future pandemic. From the above regression equation was predicted the next wave for future services and behaviors of both the gender of pandemic.

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REFERENCES

1. Brunner E. Socioeconomic determinants of health: Stress and the biology of inequality. Br Med J. 1997;314:1472-6.
2. Jackson A. The unhealthy Canadian workplace. Available at: https://www.coursehero.com/file/48691950/The-Unhealthy-Canadian-Workplacedocx/. Accessed on 20 August 2022.
3. Benedek D, Fullerton C, Ursano RJ. First responders: Mental health consequences of natural and human-made disasters for public health and public safety workers. Ann Rev Public Health. 2007;28:55-68.

4. Hobfoll SE, De Vries MW. Extreme stress and communities: Impact and intervention. New York: Springer-Verlag; 1995.
5. Van der Kolk, BA, Roth S, Pelcovitz D, Sunday S, Spinazzola J. Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. J Trauma Stress. 2005;18:389-99.
6. Norris FH, Friedman MJ, Watson PJ. 60,000 disaster victims speak: Part II. Summary and implications of the disaster mental health research. Psychiat Interperson Biol Processes. 2002;65:240-60.
7. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, et al. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. CMAJ. 2004;170(5):793-8.
8. Tansey CM, Louie M, Loeb M, Gold WL, Muller MP, de Jager J, et al. One-year outcomes and health care utilization in survivors of severe acute respiratory syndrome. Arch Intern Med. 2007;167(12):1312-20.
9. Franco LM, Bennett S, Kanfer R. Health sector reform and public sector health worker motivation: a conceptual framework. Soc Sci Med. 2002;54(8):1255-66.
10. Maunder RG, Lancee WJ, Rourke S, Hunter JJ, Goldbloom D, Balderson K, et al. Factors associated with the psychological impact of severe acute respiratory syndrome on nurses and other hospital workers in Toronto. Psychosomat Med. 2004;66(6):938-42.
11. Styra R, Hawryluck L, Robinson S, Kasapinovic S, Fones C, Gold WL. Impact on health care workers employed in high-risk areas during the Toronto SARS outbreak. J Psychosomat Res. 2008;64(2):177-83.
12. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. JAMA. 2020;2:32-8.
13. 2019-nCoV outbreak is an emergency of international concern. Available at: https://www.who.int/europe/home?v=welcome. Accessed on 20 November 2021.
14. Horowitz MJ, Wilner NR, Alvarez W. Impact of event scale: A measure of subjective stress. Psychosom Med. 1979;41:209-18.
15. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. J Personality Soc Psycho. 1986;51:1173-80.
16. McAlonan, Grainne M. Immediate and sustained psychological impact of an emerging infectious disease outbreak on health care workers. Canadian J Psychiatr. 2007;52(4):241-7.
17. Hughes MM, Groenewold MR, Lessem SE. Characteristics of health care personnel with COVID-19, United States. Morb Mortal Wkly Rep. 2020;69:1364-8.
18. Adam AM. Sample size determination in survey research. J Sci Res Rep. 2020;26:90-7.

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