Anxiety, Depression and Functional Impairment among Health Care Workers during COVID-19 Pandemic: A Cross-sectional Online Survey

Shrestha R,[1] Khatri B,[1] Adhikari S,[2] Poudyal P[1]

[1]BP Eye Foundation, Hospital for Children Eye ENT and Rehabilitation Services,

Madhyapur Thimi, Lokanthali, Bhaktapur, Nepal.

[2]Institute of Medicine,

Tribhuvan University Teaching Hospital,

Maharajgunj, Kathmandu, Nepal.

Corresponding Author

Rajan Shrestha

BP Eye Foundation, Hospital for Children Eye ENT and Rehabilitation Services,

Madhyapur Thimi, Lokanthali, Bhaktapur, Nepal.

E-mail: rajanshrestha011@gmail.com

Citation

Shrestha R, Khatri B, Adhikari S, Poudyal P. Anxiety, Depression and Functional Impairment among Health Care Workers during COVID-19 Pandemic: A Cross-Sectional Online Survey. *Kathmandu Univ Med J.* 2021;75(3):351-5.

ABSTRACT

Background

COVID-19 is an infectious disease caused by a newly discovered coronavirus. The number of cases and dramatic loss of human life worldwide created psychological problems among general public, including health care workers.

Objective

To determine the burden of anxiety, depression, and functional impairment among health care workers in the early days of lockdown during the first wave of COVID-19 outbreak in Nepal.

Method

A hospital-based cross-sectional study was carried out among all the employees of Hospital for Children Eye ENT and Rehabilitation Services, Bhaktapur during the COVID-19 pandemic lockdown from April 3, 2020 to May 2, 2020 using an online questionnaire. The tools used were adopted from Nepali version of Hospital Anxiety and Depression scale (HADS) and Nepali version of WHO Disability Assessment Schedule (WHODAS 2.0).

Result

The mean age (SD) of the participants (n=86) was 32.53 (7.92) years. Male and female participants were equal in number. The point prevalence of anxiety and depression was 25.6% and 14.0%, respectively. Females had a higher prevalence of both anxiety (39.5% vs 11.6%, $p < 0.01$) and depression (18.6% vs 9.3%, p=0.351). Clinical and non-clinical staff both had a higher prevalence of both anxiety (31.0% and 20.5%, p=0.265) and depression (16.7% and 11.4%, p=0.478). The mean functional impairment score (WHODAS 2.0) among all participants and participants with anxiety and depression was 19.47 (95% CI: 18.13-20.80), 21.27 (95% CI: 18.08-24.46), and 19.92 (95% CI: 15.28- 24.56), respectively.

Conclusion

Anxiety and depression during the first lockdown due to COVID-19 pandemic were highly prevalent in clinical and non-clinical employees. Besides controlling the outbreak, special consideration should be given to mental health.

KEY WORDS

Anxiety, COVID-19, Depression, Functional impairment, Health care workers, Online survey

INTRODUCTION

COVID-19 is an infectious disease caused by a newly discovered coronavirus. The COVID-19 pandemic has led to a dramatic loss of human life worldwide and has presented an unprecedented challenge to public health, including mental health.[1,2] The most stressful situation at that time after the disease declared as a pandemic was its unpredictability and seriousness.[3] Before the start of COVID-19 pandemic, around 13% of people aged 18 years and above had any mental disorder in Nepal.[4] During the pandemic, common mental health disorders were usually neglected.[5,6] Evidence has shown that with an increase in the number of cases and deaths from COVID-19, health care workers have been experiencing psychological problems, with a disability and functional impairment.[7-13]

Thus, this study aimed to determine the burden of anxiety, depression, and functional impairment during the initial days of COVID-19 outbreak among tertiary level health care workers at the Eye, ENT Hospital in Bhaktapur.

METHODS

This is a cross-sectional web-based survey. The data was collected between April 3, 2020, and May 2, 2020, during the first nationwide lockdown. All health care workers, including clinical staff - doctors, nurses, paramedics, laboratory staff, radiographers, and non-clinical staff - admin, housekeeping, security guards, drivers working in the Hospital for Children Eye ENT and Rehabilitation Services (CHEERS), Bhaktapur were approached for the study. Ethical approval for the study was obtained from Nepal Health Research Council (Reg. no. 269/2020P). Similarly, online consent was obtained from all the participants before starting the questionnaire.

Data collection was done through a self-administered questionnaire developed in Google forms and delivered through Facebook messenger and email. Anxiety and depression were measured using the Nepali version of 14-item Hospital Anxiety and Depression Scale (HADS) rated on a four-point scale from 0 to 3 (7-item HADS-A for Anxiety with total score 0-21 and 7-item HADS-D for Depression with total score 0-21).[14] Total score for Anxiety and Depression was calculated by adding scores obtained in respective subscales. A score of 11 or more in the respective subscale was considered to indicate anxiety or depression. Functional impairment was measured using the Nepali version of 12-item WHO Disability Assessment Schedule (WHODAS 2.0) on a five-point Likert scale from 1 to 5 (total score 12 to 60). The total score was calculated by adding the scores obtained in 12 items. This version of WHODAS 2.0 does not have cut-off values, so individuals with higher total scores were considered to have higher functional impairment.

Continuous data were presented as mean, median, quartiles and standard deviation, whereas categorical data were presented as frequency and percentage. The student's t-test was done to compare continuous variables. Chi-square test was done to find out the association of categorical variables with anxiety and depression. Binary logistic regression analysis was performed on variables having $p < 0.05$ on bivariate analysis to calculate adjusted and unadjusted Odds Ratio, including 95% confidence interval. Pearson correlation analysis was also done to determine the relationship between anxiety, depression, and WHODAS 2.0 score. Data analysis was performed using R language software version 4.0.0.

RESULTS

Out of 90 health care workers approached, 86 (95.5%) completed the survey. The mean age (SD) of the participants (n=86) was 32.53 (7.92) years. Male and female participants were equal in number. More than half of the participants were non-clinical staff. Among all the participants, 11.6% had a history of foreign travel by their family members after the pandemic started globally. Other sociodemographic characteristics and risk factors are presented in table 1.

The mean (SD) anxiety, depression and functional impairment score (WHODAS 2.0) were 7.27 (4.62), 5.13 (4.02), and 19.47 (6.23), respectively. The point prevalence of anxiety and depression was 25.6% and 14.0%, respectively. Females had a higher prevalence of both anxiety (39.5% vs 11.6%, $p < 0.01$) and depression (18.6% vs 9.3%, p=0.351). Clinical and non-clinical staff had a higher prevalence of anxiety (31.0% and 20.5%) and depression (16.7% and 11.4%). There was no significant difference in the prevalence of anxiety (p=0.265) and depression (p=0.478) among clinical and non-clinical staff.

Females had a very strong association with both anxiety (AOR=5.008 (95% CI; 1.593-15.741)) and depression (AOR=2.173 (95% CI; 0.599-7.882)). Likewise, married participants had a positive association with anxiety (AOR 4.379 (95% CI; 1.121-17.106)) and depression (AOR 1.542 (95% CI; 0.379-6.276)) (table 2).

The mean functional impairment score among all participants, participants with anxiety and depression were 19.47 (95% CI: 18.13-20.80), 21.27 (95% CI: 18.08-24.46) and 19.92 (15.28-24.56), respectively. There was a slight increase in impairment scores among participants having higher anxiety and depression scores, although the difference is not statistically significant. The first quartile, median and third quartiles for the mean score was higher among the participants with higher anxiety and depression score except in the first quartile among the group of participants with different depression scores (table 3).

Table 1. Different characteristics and point prevalence of anxiety and depression

Characteristics		n	%	Anxiety (%)	χ^2 p-value	Depression (%)	χ^2 p-value
All		86		25.6		14.0	
Gender	Male	43	50.0	11.6	<0.01	9.3	0.351*
	Female	43	50.0	39.5		18.6	
Age group	< 35 years	56	65.1	21.4	0.228	12.5	0.595
	≥ 35 years	30	34.9	33.3		16.7	
Employees type	Clinical	42	48.8	31.0	0.265	16.7	0.478
	Non clinical	44	51.2	20.5		11.4	
Educational level	Literate or High school	35	40.7	28.6	0.599	20.0	0.180
	University degree	51	59.3	23.5		9.8	
Marital status	Married	57	66.3	33.3	0.041*	15.8	0.491*
	Unmarried	29	33.7	10.3		10.3	
Staying with	With family	77	90.6	27.3	0.191†	15.6	0.594†
	Single	8	9.4	0.0		0.0	
Children or elders in the family	Yes	61	70.9	31.1	0.115*	13.1	0.994*
	No	25	29.1	12.0		16.0	
Living in	Own home	55	64.0	21.8	0.287	12.7	0.662
	Rented room	31	36.0	32.3		16.1	
Foreign travel history	Yes	10	11.6	30.0	1.000	20.0	0.919
	No	76	88.4	25.0		13.2	
Family member with chronic disease	Yes	39	45.3	23.1	0.628	15.4	0.727
	No	47	54.7	27.7		12.8	
Cough/ sore throat/ common cold	Yes	10	11.6	10.0	0.415	10.0	1.00
	No	76	88.4	27.6		14.5	

*chi-square test with continuity correction
†Fisher's exact test was performed

There was a moderate positive relationship (r=0.570) between anxiety and depression. The relationship between functional impairment with both anxiety (r=0.404) and depression (r=0.427) was found positive but weak (Table 4).

Table 2. Unadjusted and adjusted odds ratios of anxiety and depression among different genders and marital statuses

Characteristics	Anxiety		Depression	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Gender				
Male	1	1	1	1
Female	4.969 (1.63-15.15)	5.008 (1.593-15.741)	2.229 (0.62-8.05)	2.173 (0.599-7.882)
Marital status				
Unmarried	1	1	1	1
Married	4.333 (1.162-16.155)	4.379 (1.121-17.106)	1.625 (0.404-6.531)	1.542 (0.379-6.276)

Table 3. Mean 12-item WHODAS 2.0 total scores and Quartiles in participants

Group	Mean WHODAS 2.0 score (95% CI)	p-value	Quartiles		
			Q1	Median	Q3
All participants	19.47 (18.13-20.80)		15.00	18.50	23.50
Anxiety score < 11	18.84 (17.40-20.29)	0.115	14.25	18.00	22.75
Anxiety Score ≥ 11	21.27 (18.08-24.46)		15.00	20.00	28.00
Depression Score < 11	19.39 (17.98-20.80)	0.788	15.00	18.00	23.25
Depression Score ≥ 11	19.92 (15.28-24.56)		12.75	19.50	26.00

Table 4. Correlation among Anxiety, Depression and Functional impairment score

	Anxiety Score	Depression Score	Functional Impairment Score
Anxiety Score	1	0.570**	0.404**
Depression Score	0.570**	1	0.427**
Functional Impairment Score	0.404**	0.427**	1

**Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

This study revealed that a significant proportion of health care workers experienced mental health symptoms/ problems such as anxiety (25.6%) and depression (14.0%). The prevalence found in this study contrast with few studies done among different health care workers in Nepal and other countries at the time of the COVID-19 pandemic.

The prevalence of anxiety and depression found in this study is higher than the prevalence reported in a study using a similar tool among health care workers belonging to different levels of health care facilities from inside and

Period of Study ref	Country	Data collection method	Demography	Tool used	Sample size	Anxiety, depression
April 3 to May 2, 2020 (This study)	Nepal	Online	Clinical and non-clinical health care workers	HADS, WHO-DAS 2.0	86	A-25.4% D-14.0%
April 26 to May 12, 2020[9]	Nepal	Online	Clinical and public health practitioners	HADS	475	A-18.3% D-13.5%
April 12 to May 12, 2020[15,23]	Nepal	Online	Doctors, Nurses and laboratory personnel	DASS-21	404	A-35.7% D-29.0%
Dec. 25 2021 to Jan. 25 2021[16]	Nepal, USA, UK, Maldives, India, Pakistan, china	Online	Doctors, nurses, health assistants, lab technicians, pharmacists	DASS-21	208	A-30.0% D-22.5%
January 29 to February 3, 2020[17]	China	face to face interview	Physicians Nurses	PHQ-9, GAD -7	1,257	A-12.3% D-14.8%
January 31 to February 2, 2020[18]	China	Online	General population	(WHO-5), (GAD-7)	5,851	A-22.6% D-48.3%
18–22 March 2020[19]	Italy	Online	General population	DASS-21	2,766	A-18.7% D-32.8%
Not mentioned	India	Direct clinical interview	Clinical and non-clinical health care workers	DASS-21	200	Health care staffs A-56.7% D-48.0% Administrative staffs A-18.0% D-22.0%

outside of Kathmandu Valley, which reported the prevalence of anxiety and depression in 18.3% and 13.5% participants respectively.[9] This may be due to the difference in study population as our study only included health care workers from tertiary level Eye and ENT hospitals in Kathmandu Valley. The prevalence of anxiety and depression in our study is less than the prevalence reported by few other studies done using Depression, Anxiety and Stress Scale (DASS-21). A study done by Pandey et al. reported a higher prevalence of anxiety (35.7%) and depression (29.0%), though it is not comparable as the study used different tools and excluded health care workers other than doctors, nurses and laboratory personnel.[15] Similarly, a study done among doctors, nurses and paramedics residing in Nepal and abroad, using DASS-21, reported the prevalence of anxiety and depression as 22.5% and 30.05%, respectively, which is higher than the findings of our study.[16] Although those studies were done among different populations using different tools and are not comparable, and the findings can signal the higher burden of mental health problems among health care workers in Nepal.

Similarly, a study done in China using a different tool (9-item Patient Health Questionnaire and 7-item Generalized Anxiety Disorder) showed that anxiety and depression were prevalent among 44.6% and 50.4% of the participants, respectively.[17] Another study in China using WHO five well-being Index and the generalized anxiety disorder scale in the general population during the pandemic revealed that 22.6% of participants had experienced anxiety, and 48.3% had a certain level of depression.[18] Depression was prevalent among 32% of the participants, as depicted by a study in Italy.[19] Anxiety and depression were prevalent in 16% and 28% of participants, respectively.[20] This shows a wide variation in the prevalence of anxiety and depression in Nepal and other countries. This variation could be due to the difference in sample size, study population, tools used and time of the data collection with the difference in the number of confirmed COVID-19 cases and fatality rates.

In this study, female participants had a higher prevalence of both anxiety (39.5% vs 11.6%, $p < 0.01$) and depression (18.6% vs 9.3%, $p=0.351$). Such gender differences may be due to differences in biological components and different coping strategies they have. This finding is in line with studies conducted in Nepal, China, India and Italy.[17,19,21] In this study, both anxiety and depression were associated with marital status. However, in a recent study performed among health care workers in Nepal, marital status was not associated with mental health symptoms.[9]

As expected, this study found a higher prevalence of both anxiety and depression among clinical health care workers than non-clinical health care workers. Although the difference is not statistically significant, it may be due to the small sample size. This finding is also supported by a study done by Sharma et al. in India, which found that a significantly higher proportion of front-line health care workers had both anxiety (18.0% vs. 56.7%, $p<0.001$) and depression (22.05% vs. 48.0%, $p<0.001$) compared to non-clinical health care workers.[22] The higher prevalence of anxiety and depression among clinical health care workers maybe because they interact with many patients daily than non-clinical health care workers.

The low total WHODAS 2.0 score indicating low functional impairment among participants was quite surprising, even though there were restricted normal outdoor activities during the lockdown. The low average functional impairment score may be due to the no travel restrictions for health care workers having hospital employee's identity

cards. Few studies done using another tool (work and social adjustment scale) among nurses in Malawi found that about half of the participants have functional impairment during the COVID-19 pandemic.[24]

This study has several limitations that need to be acknowledged. First, it was limited to a single hospital, thus limiting the generalization of the findings. Second, long-term psychological problems could not be assessed while the situation worsened. This is because this study was performed during the early weeks of lockdown due to the COVID-19 pandemic. We also do not have baseline information for all scales/tools we used. The scores might not be only due to COVID-19, as they might show the caseness before our study. There might be respondent bias because a face-to-face interview was not possible, during which we may have missed information on sensitive issues. Additionally, the findings are based on self-reports, so there was no means of clinical verification.

CONCLUSION

Anxiety and depression during the COVID-19 pandemic are highly prevalent in clinical and non-clinical health care workers without causing significant functional impairment. Besides controlling the outbreak, special consideration should be given to mental health. Multicenter anxiety, depression, and functional impairment studies with larger sample sizes, including all health care workers, are recommended.

REFERENCES

1. WHO. WHO Coronavirus (COVID-19) Dashboard 2021 [August 4, 2021]. Available from: https://covid19.who.int/.
2. WHO. Mental health & COVID-19 2021 [August 4, 2021]. Available from: https://www.who.int/teams/mental-health-and-substance-use/covid-19.
3. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. The Lancet. 2020;395(10224):e37-e8.
4. Jha AK, Ojha SP, Dahal S, BC RK, Jha BK, Pradhan A, Labh S, Dhimal M. A report on pilot study of national mental health survey. Kathmandu, Nepal: Nepal Health Research Council. 2018.
5. Dar KA, Iqbal N, Mushtaq A. Intolerance of uncertainty, depression, and anxiety: Examining the indirect and moderating effects of worry. *Asian journal of psychiatry*. 2017;29:129-33.
6. Naser AY, Dahmash EZ, Al-Rousan R, Alwafi H, Alrawashdeh HM, Ghoul I, et al. Mental health status of the general population, healthcare professionals, and university students during 2019 coronavirus disease outbreak in Jordan: a cross-sectional study. *medRxiv.* 2020.
7. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry.* 2020;7(3):228-9.
8. Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet Psychiatry*. 2020;7(3):e14.
9. Khanal P, Devkota N, Dahal M, Paudel K, Joshi D. Mental health impacts among health care workers during COVID-19 in a low resource setting: a cross-sectional survey from Nepal. Globalization and health. 2020;16(1):89.
10. Tanner J, Zeffiro T, Wyss D, Perron N, Rufer M, Mueller-Pfeiffer C. Psychiatric symptom profiles predict functional impairment. *Frontiers in psychiatry*. 2019;10:37.
11. Thomas CC, Rathod SD, De Silva MJ, Weiss HA, Patel V. The 12-item WHO Disability Assessment Schedule II as an outcome measure for treatment of common mental disorders. *Glob Ment Health (Camb).* 2016;3:e14-e.
12. Hernández-Orduña O R-GR, Martínez-López N, Muñoz-Toledo C, González-Salas A, Cabello M, Domínguez-Martínez T, Medina-Mora ME. WHODAS and the evaluation of disability among people with mental disorders with and without psychotic symptoms. *Salud Mental.* 2017;40(5).
13. Arun MP, Bharath S, Pal PK, Singh G. Relationship of depression, disability, and quality of life in Parkinson's disease: a hospital-based case-control study. *Neurology India*. 2011;59(2):185-9.
14. Risal A, Manandhar K, Linde M, Koju R, Steiner TJ, Holen A. Reliability and Validity of a Nepali-language Version of the Hospital Anxiety and Depression Scale (HADS). *Kathmandu University Medical Journal.* 2015;13(50):115-24.
15. Apsara P, Chandrakala S, Ram Hari C, Narmada D, Kamal R, Suman P, et al. Stress, Anxiety, Depression and Their Associated Factors among Health Care Workers During COVID -19 Pandemic in Nepal. *Journal of Nepal Health Research Council*. 2021;18(4).
16. Sharma I, Misra A, Kumar Shrestha B, Kumar Koirala A, Banjade A, Banjade P. Depression, Anxiety and Stress among Nepali Health Care Workers during the Coronavirus Disease 2019 Pandemic: A Cross-sectional Survey. *Journal of Nepal Medical Association.* 2021;59(238).
17. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*. 2020;3(3):e203976-e.
18. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. *PloS one.* 2020;15(4):e0231924.
19. Mazza C, Ricci E, Biondi S, Colasanti M, Ferracuti S, Napoli C, et al. A nationwide survey of psychological distress among italian people during the COVID-19 pandemic: Immediate psychological responses and associated factors. *International journal of environmental research and public health.* 2020;17(9):3165.
20. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. *Asian journal of psychiatry.* 2020:102066.
21. Rehman U, Shahnawaz MG, Khan NH, Kharshiing KD, Khursheed M, Gupta K, et al. Depression, Anxiety and Stress Among Indians in Times of Covid-19 Lockdown. *Community mental health journal*. 2020:1-7.
22. Sharma R, Saxena A, Magoon R, Jain MK. A cross-sectional analysis of prevalence and factors related to depression, anxiety, and stress in health care workers amidst the COVID-19 pandemic. *Indian J Anaesth*. 2020;64(Suppl 4):S242-S4.
23. Pandey A, Sharma C, Chapagain RH, Devkota N, Ranabhat K, Pant S, et al. Stress, Anxiety, Depression and Their Associated Factors among Health Care Workers During COVID -19 Pandemic in Nepal. *Journal of Nepal Health Research Council*. 2021;18(4):655-60.
24. Chorwe-Sungani G. Assessing COVID-19-related anxiety and functional impairment amongst nurses in Malawi. *African journal of primary health care & family medicine*. 2021;13(1):e1-e6.