

Assessment of Stress Levels amongst Radiation Oncology Health Care Workers during COVID-19 Pandemic: A Double Centre Study

Acharya B^{1*}, Chapagain S², Rayamajhi A³, Khanal B⁴

^{1,2*}Department of Clinical Oncology, National Academy of Medical Sciences, Bir Hospital, Nepal.

³Department of Radiation Oncology, Nepal Cancer Hospital and Research Center.

⁴Department of Dental Surgery, National Academy of Medical Sciences, Bir Hospital, Nepal.

ABSTRACT

Purpose: To evaluate stress levels of health care workers in Radiation Oncology in Nepal during COVID-19.

Methods: A total of 46 eligible health care workers working in radiation oncology departments of two tertiary care hospitals in Nepal were enrolled in this study from May 2020 to July 2020. The 7- item Generalized Anxiety Disorder, 9- item Patient Health Questionnaire, and 22-item Impact of Events Scale-Revised were used for assessing anxiety, depression, and post-traumatic stress disorder. Precautionary measures are taken by the health care workers and satisfaction of organizational preparedness was also assessed.

Results: Responses to the given questionnaire of all the participants were assessed. The median age was 33 years. The majority of participants had the mild impact of anxiety (70%), depression (75%), and post-traumatic stress (89%). Most of the participants (97.9%) followed hand hygiene as precautionary measures. Though anxiety and depression were mild, worry about family members getting COVID-19 was more (65.2%). Approximately half of the responders thought that organizations were concerned about their safety and necessary precautionary measures were taken.

Conclusion: This survey highlighted the importance of taking measures for addressing the need of health care workers and finding out a solution to eliminating mild anxiety and depression amongst them.

Key words: COVID 19, Pandemic Stress Levels, Precautionary Measures, Personal Concern, Radiation Oncology Health Workers, Satisfaction of Organizational Preparedness.

Address for Correspondence Author

Dr. Acharya B; HOD, Department of Clinical Oncology, National Academy of Medical Sciences, Bir Hospital, Nepal.

E-mail: abibek@gmail.com

Crossref Doi: <https://doi.org/10.36437/irmhs.2021.4.2.C>

Introduction

COVID-19 Pandemic started as there was a cluster of cases of pneumonia reported in Wuhan, Hubei Province in China in late December 2019.¹ Soon after cases were seen in Europe, Australia, United States, Asia, and Africa affecting 219 countries and their territories. WHO (World Health

Organization) declared COVID 19 as a pandemic on March 11, 2020.²

The first case in Nepal was detected in January 2020 in a Nepalese student who returned from Wuhan, China. After two months of the first case with all the strict government measures second case was reported on March 23, 2020, and local

transmission was detected on 4th April 2020.^{3,4} Government of Nepal issued a nationwide lockdown from 24 March to 21 July 2020. lockdown.⁵

In this time of global chaos, the psychological impact of COVID-19 was poorly addressed as the priority was driven towards prevention and medical management of it.^{6,7} Evidence has shown that health care workers (HCW) directly involved in the diagnosis, management, and treatment of patients on a day-to-day basis were more at risk of developing mental health symptoms.⁸

Increased work burden, inadequate personal protective equipment (PPE), lack of specific treatment, vulnerability to infection, isolation from family, fear of spreading the virus to family members along with inadequate support in the workplace contributed to the mental burden on health workers.⁹ A study conducted to assess the mental health impacts among health workers during COVID 19 in Nepal showed a high prevalence of anxiety, depression, and insomnia during the initial phase with nurses having higher odds of developing anxiety than other health workers.¹⁰

This study was conducted to assess the mental health status among the radiation oncology health workers. The study also assesses the precautionary measures taken by the health care workers and their satisfaction on organizational preparedness.

Methods

This is a cross-sectional study conducted on the radiation oncology department in two institutes, NAMS (National Academy of Medical Sciences), Bir Hospital, and Nepal Cancer Hospital (NCH). For this study,

approval was obtained from the Ethical Review Board (ERB) of the Nepal Health Research Council (NHRC). All the HCW in the department of radiation oncology were included. It comprised staff at all cadres and disciplines (oncologists, physicists, technologists, and nurses). Personnel unable to fill the English versions of the instruments and those unwilling to give consent were excluded. Informed consent was taken from all the eligible participants. The GAD-7, PHQ-9, and IES-R questions were provided as handwritten forms and asked to be filled and responses were recorded for analysis. Along with it, the precautionary measures taken by the participants and the satisfactory response towards organizational preparedness were assessed with the questionnaire. The 7 items Generalized Anxiety Disorder (GAD-7) scale and 9-item Patient Health Questionnaire (PHQ-9) is routinely used to assess anxiety and depression in a clinic and the 22-item Impact of events scale revised can analyze the psychological trauma and assess the post-traumatic stress disorder. All these instruments have been validated and used for assessment.^{11,12,13}

The severity of anxiety, depression, and post-traumatic stress disorder was assessed from the GAD-7, PHQ-9, and IES-R scores. GAD-7 includes scores 0-4 that represent minimally, 5-9 mild, 10-14 moderate, and 15-21 severe anxiety. PHQ-9 scores 0-4 represent none, 5-9 mild, 10-14 moderate, 15-19 moderately severe and, 20-27 severe depression. For IES-R scored from 0 to 88, a total score of 24 or more suggested post-traumatic stress disorder.¹⁴

Participants

A total number of 46 participants of all cadres (oncologists, physicists, technologists, nurses) participated in the study from May 16, 2020, to July 25, 2020. All the selected HCW of these two centers were requested to fill the questionnaire with the assured confidentiality of information provided.

Statistical Analysis

Data analysis was done using Statistical Package for Social Sciences software, Version 25. Univariate analysis was done to identify the most common symptom and also the causative factor for anxiety, depression, and stress. Cox proportional hazards model expressed as hazard ratio (HR) with 95%

Confidence Interval. Any p-value of ≤ 0.05 was considered statistically significant.

Results

Demographic Profile: All the 46 total consented participants included were considered for final analysis. A basic sociodemographic profile was collected from all participants. This included factors such as age, sex, marital status, number of household members, rooms in the household, distance from home to workplace, education level, occupation, co-morbidities, history of smoking or any COVID-19 related symptoms, contact history in the prior 14 days, lifestyle changes and personal concerns. The sociodemographic details of all 46 participants are shown in Table.1.

		N (%)
Sex	Male	20 (43.5)
	Female	26 (56.5)
Marital status	Single	17 (37.0)
	Married	29 (63.0)
Occupation	Physician	18 (39.1)
	Nurse	17 (37.0)
	Therapist	6 (13.1)
	Administrator	3 (6.5)
	Physicist	2 (4.3)
Cadre of employment	Junior staff	13 (28.3)
	Middle run staff	15 (32.6)
	Senior staff	18 (39.2)
Medical history	Hypertension	4 (8.7)
	DM	1 (2.2)
	Asthma/COPD	2 (4.3)
	Others	2 (4.3)
	None	37 (80.4)
History of smoking/tobacco use	Yes	6 (13.1)
	No	40 (86.9)
Educational qualification	Primary	1 (2.2)

	Secondary	8 (17.4)
	Bachelor	19 (41.3)
	Masters	16 (34.8)
	Doctorate	2 (4.3)

Table 1: Sociodemographic Profile of Study Population

COVID-19 Symptoms

COVID-19 symptoms usually appear mostly after 2-14 days after exposure to the virus. For this study, we have taken a recall period of 2 weeks before the date of filing of the

forms. Though the majority reported no symptoms in the last 14 days, those who had symptoms, among them headache was the commonest followed by lethargy as shown in table 2.

S NO	Symptom	N (%)	
		Yes	No
1	Headache	19 (41.3)	27 (58.7)
2	Throat pain	5 (10.9)	41 (89.1)
3	Cough	2 (4.3)	44 (95.7)
4	Fever	0 (0.0)	46 (100.0)
5	Coryza	0 (0.0)	46 (100.0)
6	Myalgia	4 (8.7)	42 (91.3)
7	Breathing difficulty	1 (2.2)	45 (97.8)
8	Palpitations	2 (4.3)	44 (95.7)
9	Anxiety	8 (17.4)	38 (82.6)
10	Lethargy	11 (23.9)	35 (76.1)
11	Insomnia	6 (13.1)	40 (86.9)
12	Dizziness	1 (2.2)	45 (97.8)

Table 2: Physical symptoms in last 14 days

COVID-19 contact history in last 14 days

None of the respondents have a history of hospitalizations and three of them had a history of contact with suspected COVID positive cases or infected material as shown in Table 3.

Among the participants, three had suspected places of contact in the workplace and only two had special leave due to the perceived high risk of contracting COVID-19.

S NO	Symptom	N (%)	
		Yes	No
1	Recent H/O of close contact with confirmed COVID positive case	1 (2.2)	45 (97.8)
2	Recent H/O testing for COVID	1 (2.2)	45 (97.8)
3	Recent H/O quarantine for COVID	1 (2.2)	45 (97.8)
4	Recent H/O of indirect contact with confirmed COVID positive case	2 (4.3)	44 (95.7)
5	Recent H/O of contact with suspected COVID positive case or infected material	3 (6.5)	43 (93.5)
6	Recent H/O hospitalization	0 (0.0)	100.0)

Table 3: Covid contact history in last 14 days

Precautionary measures taken for COVID

Among the participants, most of them followed the precautionary measures, with washing hands with soap and water being

the commonest where 45 participants followed the measure and wearing scrubs at the workplace being the lowest was just 32 followed the measure.

S NO	Symptom	Yes	No
1	Cough etiquettes	38 (82.6)	8 (17.4)
2	Washing hands with soap and water	45 (97.9)	1 (2.2)
3	Social distancing	42 (91.3)	4 (8.7)
4	Wearing mask at all time	44 (95.7)	2 (4.3)
5	Sanitizing the work place frequently	37 (80.4)	9 (19.6)
6	Avoid unnecessary visits to other departments or other places	41 (89.1)	5 (10.9)
7	Avoid personal belongings to workplace	39 (84.8)	7 (15.2)
8	Warm water bath and cloth wash	38 (82.6)	8 (17.4)
9	Wearing scrubs at work place	32 (69.6)	14 (30.4)
10	Use of appropriate PPE as per risk	37 (80.4)	9 (19.6)

Table 4: Precautionary measure during COVID-19

Anxiety, depression and Stress scores

Anxiety, depression, and stress score were assessed using GAD-7, PHQ-9, and IES-R. Among the participants, there was mild

anxiety among 70% of the participants, mild depression on 75% of the participants, and subclinical or mild impact of post-traumatic stress disorder based on IES-R score was

seen on 89% of the participants. Regarding personal concern worry about other family members getting COVID-19 was highest with

a total of 65.2% participants as depicted in table 5.

S NO	Symptom	N (%)			
		Very much	Quite a bit	A little	Not at all
1	Likelihood of contracting COVID-19 during the current outbreak	22 (47.8)	15 (32.6)	5 (10.9)	4 (8.7)
2	Worry about other family members getting COVID-19 infection	30 (65.2)	7 (15.2)	1 (2.2)	8 (17.4)
3	Worry about your child getting COVID-19 infection	15 (32.6)	4 (8.7)	22 (47.8)	5 (10.9)
4	Fear of being isolated	11(23.9)	10 (21.7)	13 (28.3)	12 (26.1)
5	Feelings of uncertainty and social stigmatization	12 (26.1)	11 (23.9)	9 (19.6)	14 (30.4)
6	Fear of family care in case of self-isolation	20 (43.5)	13 (28.3)	7 (15.2)	6 (13.0)

Table 5: Personal concern

Satisfaction of organization preparedness for COVID-19

Among the participants, most of the respondents were somewhat satisfied with organizational preparedness during COVID-19 with a majority of responding on

somewhat satisfied being on the preparedness of the department and necessary support provided to be able to perform the duty (travel, working hours, PPE) as shown in Table 6.

S NO	Symptom	Very satisfied	Somewhat satisfied	Not very satisfied	Not at all satisfied
1	Preparedness of the department for COVID	4 (8.7)	22 (47.8)	8 (17.4)	12 (26.1)
2	Necessary support provided for you to be able to perform your duty (travel, working hours, PPE etc.)	4 (8.7)	22 (47.8)	10 (21.7)	10 (21.7)
3	Provision of updated information on regular basis	7 (15.2)	17 (37.0)	13 (28.3)	9 (19.6)
4	Provided a secure and safe working conditions	5 (10.9)	19 (41.3)	14 (30.4)	8 (17.4)
5	Capability of the institution of managing COVID positive cases	1 (2.2)	20 (43.5)	16 (34.8)	9 (19.6)

Table 6: Satisfaction of Organizational preparedness during COVID 19 outbreak

Working hours and safety

Approximately half the respondents think that their organization is concerned about their safety (56.5%, n=26) and their concerns were addressed in a satisfaction and timely (50.0%, n=23) (Table). The mean working hours per week during the pandemic reported by the respondents was 31 hours, ranging from 24-48 hours.

Discussion

COVID-19 Pandemic has been the question since the end of 2019 till date with no adequate answer and no exact solutions with a lot of anticipations resulting not only in physical symptoms but also impact on mental health. Increased risk of acquiring viruses in the workplace and daily transit to the workplace has exacerbated the mental health status of the health care workers.⁸

Health professionals in the radiation oncology department have to come in contact with the same patient for several days due to fractionation treatment. Most of the time, these patients are not admitted and they need to commute on daily basis. This predisposes the patient as well as the HCW to increased chances of getting infected.

The meta-analysis of 13 studies about the prevalence of depression, anxiety, and insomnia consisting of 33,062 health care workers showed anxiety in 12 studies with the prevalence of 23.2%, depression in 10 studies with the prevalence of 22.8%, and insomnia prevalence was 38.5% in 5 studies.¹⁵ In our study most of the participants showed only mild features of anxiety (70%) and depression (75%) and also suboptimal level or mild level of post-traumatic stress on 89%. In our country, the pandemic was in the gradual process and affected late compared to other countries there was a Leeway period of around 2

months where the health professionals were prepared physically and mentally to some extent. This could be the reason for anxiety and depression to be in a milder form. Similarly, in the context of Nepal, the pandemic resulted in an increased number of COVID positive cases in frontline workers but did not hit hard resulting in uneventful recovery which may have resulted more in mild features of anxiety and depression.

Personal concern was found more on the participants undertaking questions like the likelihood of contracting current outbreak, worry about family members getting COVID-19 infection, worry about child getting COVID-19 infection, fear of being isolated, feeling of uncertainty and social stigmatization, fear of family care in case of self-isolation which was similar to study that assess sources of anxiety in health care workers.¹⁶

Regarding precautionary measures taken by health workers, the majority of the participants followed the precautionary measure. Thus, our study showed their measures are in line with WHO-developed guidelines for health workers while working on the contagious situation.¹⁷

Assessing the view of participants regarding satisfaction of organization preparedness during COVID-19 outbreak, our study showed majority with a satisfactory response similar to study in the same aspect where 62.4 % of employees were satisfied with measures put to combat COVID-19. Staffs were most satisfied with infection prevention and control measures and information on respiratory hygiene and cough etiquette.¹⁸ Though our study showed a majority in "somewhat satisfactory" response but not in "very satisfactory" response, this could be

due to the difference between the two studies in the use of scales.

The majority of our responders did not develop symptoms during COVID -19, as there were very few cases who were suspected to have direct contact with COVID positive cases, and among those who had symptoms, there was mostly headache and lethargy which can also be a result of mental health. This finding is similar to a study that assesses the symptoms in health workers during the COVID-19 epidemic were workers who have been exposed but were not positive at the RT-PCR test. They were found to have an increased risk of exhaustion, muscle pain, sore throat, anxiety, and depression.¹⁹

Conclusion

Our study showed that there was a mild form of symptoms related to mental health during COVID-19 among radiation workers. With the increased possibility of a second wave of the pandemic, it is very necessary to address these milder forms of mental health issues with the adequate measure as psychotherapy, breathing exercises, customized consultations.

References

1. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H, Cheng Z, Xiong Y, Zhao Y. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia Wuhan, China. *Jama*. 2020 Mar 17;323(11):1061-9.[[PubMed](#) | [Full Text](#) | [DOI](#)]
2. Worldometer . (2020). <https://www.worldometers.info/coronavirus/>[[Full Text](#)]
3. Bastola A, Sah R, Rodriguez-Morales AJ, Lal BK, Jha R, Ojha HC, Shrestha B, Chu DK, Poon LL, Costello A, Morita K. The first 2019 novel coronavirus case in Nepal. *The Lancet Infectious Diseases*. 2020 Mar 1;20(3):279-80[[PubMed](#) | [Full Text](#) | [DOI](#)]
4. Panthee B, Dhungana S, Panthee N, Paudel A, Gyawali S, Panthee S. COVID-19: the current situation in Nepal. *New microbes and new infections*. 2020 Aug 5:100737. [[PubMed](#) | [Full Text](#) | [DOI](#)]
5. Parajuli KS, Banstola A, Parajuli RR. Assessment of COVID-19 pandemic in Nepal: A lockdown scenario analysis. *Med Rxiv*. 2020 Jan 1. [[Full Text](#) | [DOI](#)]
6. Duan L, Zhu G. Psychological interventions for people affected by the COVID-19 epidemic. *The Lancet Psychiatry*. 2020 Apr 1; 7(4):300-2. [[PubMed](#) | [Full Text](#) | [DOI](#)]
7. Xiang YT, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, Ng CH. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry*. 2020 Mar 1; 7(3):228-9. [[PubMed](#) | [Full Text](#) | [DOI](#)]
8. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA network open*. 2020 Mar 2;3(3):e203976.[[PubMed](#) | [Full Text](#) | [DOI](#)]
9. Neto ML, Almeida HG, Esmeraldo JD, Nobre CB, Pinheiro WR, de Oliveira CR, da Costa Sousa I, Lima OM, Lima NN, Moreira MM, Lima CK. When health professionals look death in the eye: the mental health of professionals who deal daily with the 2019 coronavirus outbreak. *Psychiatry Research*. 2020 Jun 1;288:112972.[[PubMed](#) | [Full Text](#) | [DOI](#)]
10. Khanal P, Devkota N, Dahal M, Paudel K, Joshi D. Mental health impacts among health workers during COVID-19 in a low resource setting: a cross-sectional survey from Nepal.

- Globalization and health. 2020 Dec;16(1):1-2. [[PubMed](#) | [Full Text](#) | [DOI](#)]
11. Spitzer RL, Kroenke K, Williams JB. Generalized anxiety disorder 7-item (GAD-7) scale. Arch Intern Med. 2006; 166:1092-7. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 12. Kroenke K, Spitzer RL, Williams JB. DSW2The PHQ-9. Validity of a Brief Depression Severity Measure J Gen Intern Med. 2001 Sep; 16(9):606-13. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 13. Weiss DS, Marmar CR. Impact of Event Scale-Revised (IES-R). Cross-cultural assessment of psychological trauma and PTSD. 2007:219-38. [[Full Text](#) | [DOI](#)]
 14. Creamer M, Bell R, Failla S. Psychometric properties of the impact of event scale—revised. Behaviour research and therapy. 2003 Dec 1; 41(12):1489-96. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 15. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. Brain, behavior, and immunity. 2020 May 8. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 16. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. Jama. 2020 Jun 2; 323(21):2133-4. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 17. World Health Organization. Risk assessment and management of exposure of health care workers in the context of COVID-19: interim guidance, 19 March 2020. World Health Organization; 2020. [[Full Text](#)]
 18. Ogboghodo EO, Nwaogwugwu JC, Obarisiagbon OE, Omo-Ikirodah OT, Uwugiaren EI, Akoria OA, Obaseki DE, Ndubuisi M. Health Facility Preparedness and Response to COVID-19: An Assessment of Employee Satisfaction in a Teaching Hospital in Southern Nigeria. Central African Journal of Public Health. 2020 Sep 10; 6(5):242. [[PubMed](#) | [Full Text](#) | [DOI](#)]
 19. Magnavita N, Tripepi G, Di Prinzio RR. Symptoms in health care workers during the COVID-epidemic. A cross-sectional survey. International journal of environmental research and public health. 2020 Jan; 17(14):5218. [[PubMed](#) | [Full Text](#) | [DOI](#)]

How to cite this Article: Acharya B, Chapagain S, Rayamajhi A, Khanal B; [Assessment of Stress Levels amongst Radiation Oncology Health Care Workers during COVID-19 Pandemic: A Double Centre Study](#); Int. Res. Med. Health Sci., 2020; (4-2): 19-27; doi: <https://doi.org/10.36437/irmhs.2021.4.2.C>

Source of Support: Nil,

Conflict of Interest: None declared.

Received: 14-2-2021; **Revision:** 7-4-2021; **Accepted:** 12-4-2021