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Editorial

Mental Health Impact of COVID-19 in Radiation Oncology Health Care Workers of Asian Countries

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A pandemic of epic proportions, COVID-19, caused by the new virus SARS-CoV-2, has taken the Asian medical fraternity by storm, not to undermine its impact on the rest of the world [1]. The number of affected patients deluging hospitals has devastated the existing protocols of treatment and medical administration. Hospitals have been constrained to abandon traditional areas of medical attention and concentrate on the new epidemic [2]. The sudden surge in the number of COVID-19 cases, coupled with national lockdowns, has exacerbated the pressure on health care systems across the globe [3].

The highly infectious nature of the virus and the lack of a medical repertoire to effectively combat it have put health care workers (HCWs) across Asia under the burden of mental and physical fatigue. Hospitals are working around the clock, over the accepted and permissible limits of infrastructure and manpower. The pressure on HCWs, both physical and psychological, with the added dimension of social ostracism, has made them susceptible to a variety of health consequences [4]. This calls for ameliorative steps to be taken to keep the medical system from collapsing while facing an aggressive virus that has claimed over two million lives across the globe.

The COVID-19 pandemic created a detrimental impact on oncology centres worldwide [5]. In cancer care, especially radiation oncology, the course of treatment extends to several weeks. The physicians and health care personnel involved – medical physicists, nurses, radiation therapy technologists, trainees and social workers – are at risk of constant exposure due to the fractionated nature of the radiation course. Psychological effects, such as anxiety, depression, stress, etc., significantly affect the medical workforce in the pandemic setting. The ‘morale and mental health’ of the HCWs are vital at such critical times. The

indefatigable effort of the HCWs in the oncology community has made it possible to extend services to vulnerable cancer patients impacted by the pandemic [6].

An analysis of HCWs brings out a collective fear among them, largely sequestered in the domain of psychological pressure, infrastructural inadequacies, personnel administration and socioeconomic constraints [7]. There is a high risk of infecting family members, especially in an Asian joint family environment with low/middle income and a high density of family members; inadequacy of personal protective equipment and raw exposure to infected patients; long working hours, shifts, etc. The long period of mandatory quarantine for HCWs has also had a deleterious effect on their mental health [8].

In this backdrop, the psychological impact of COVID-19 among radiation oncology HCWs catering to patients from various tertiary cancer care centres in Asia was analysed. The approval of the Institutional Ethics Committee (IEC) and registration under the Clinical Trial Registry of India (CTRI) was taken before the start of the study. With informed consent, 758 HCWs from 29 cancer centres with radiation oncology facilities in Bangladesh, India, Indonesia and Nepal participated in the study.

The analysis covered a period of 3 months from May to July 2020, when the pandemic was at its peak. A basic demographic profile and answers to three questionnaires to evaluate mental health status, the seven-item Generalised Anxiety Disorder (GAD-7), the nine-item Patient Health Questionnaire (PHQ-9) and the 22-item Impact of Events Scale-revised (IES-R), were collected, with the help of responses documented on Google sheets. The severity of anxiety, depression and post-traumatic stress disorder was examined from the GAD-7, PHQ-9 and IES-R scores, respectively, with higher scores representing increased severity.

Of 758 eligible subjects, larger proportions of participants were from India and Indonesia followed by Nepal and Bangladesh. Gender was almost equally distributed, with a

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median age of 31 years. About one-third of the study participants had existing comorbidities, with a few subjects having a history of smoking. Participants were mostly married and most had above secondary education. About two-thirds of the population had less than three rooms in households and one-third had more than two children below 15 years of age. Physicians were the most important, followed by physicists, therapists, nurses, allied HCWs and administrators. Almost half the participants had COVID-19-associated symptoms during the study period.

A countrywide symptom analysis showed that the novel coronavirus presented both short- and long-term side-effects. Headache and anxiety were common symptoms in Indian and Bangladeshi participants. In Indonesia and Nepal, myalgia and coryza were dominant. Levels of stress and fear among HCWs were disparate in countries scrutinised. Exposure to COVID-19-positive patients exhibited enhanced stress levels, largely related to fear of quarantine/isolation from family members, etc. The radiation workforce from Bangladesh had the highest number of contacts with COVID-19-positive patients, followed by India, Indonesia and Nepal. A recent history of COVID testing was highest in Indonesia (25.4%) and lowest in Nepal (1.7%).

In the international research study, levels of moderate to severe anxiety (31.5–38.2%), depression (27.8–34.3%) and stress (15.5–21%) concomitant with personal concerns were documented for HCWs from all the countries under review. Moderate to severe depression was conspicuous in one-third of all participants, with a slightly higher trajectory for participants from Bangladesh. One-fifth of the Indian participants studied had severe stress. Moderate to severe concerns were exhibited in more than half the HCWs from Indonesia and Nepal and one-third from Bangladesh and India.

The causative factors for mental anxieties that exhibited in depression and dejection were linked to the casual or negligent approach towards mandatory precautions for COVID-19, country of HCW (highest in Bangladesh and India), smoking status, history of contact with COVID-19 cases and its symptoms. Personal concerns related to the pandemic were intertwined with the mental symptoms and a significant correlation was observed with young age, marital status, higher number of family members and children in the family, cadre and Indonesians. All nations under study generally exhibited similar causative factors and variations were determined by the conditions of development, quality of human resources, provision of medical facilities and sociocultural climate in combating the coronavirus.

It has been conclusively seen that among radiation oncology personnel in Asian countries, moderate to severe levels of anxiety and depression were endemic in one-third

of the workforce, whereas moderate to severe stress was documented in one-fifth. The development of COVID-19-related symptoms, history of contact, non-compliance to precautionary measures and pressure on the available medical facilities were most significantly correlated with increasing levels of anxiety, depression and stress. The study highlights that appropriate and timely interventions in the backdrop of serious concerns are to be carried out to mitigate the lingering mental sequelae of the pandemic to HCWs. Future strategies and guidelines for cancer management during the pandemic should strongly recommend the provision of a sound environment to circumvent stress among HCWs, as it affects a significant proportion of the workforce.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Nguyen LH, Drew DA, Joshi AD, Guo CG, Ma W, Mehta RS, *et al.* Risk of COVID-19 among frontline healthcare workers and the general community: a prospective cohort study. *medRxiv* 2020.04.29:20084111. <https://doi.org/10.1101/2020.04.29.20084111>.
- [2] Cavallo JJ, Donoho DA, Forman HP. Hospital capacity and operations in the coronavirus disease 2019 (COVID-19) pandemic — planning for the nth patient. *JAMA Health Forum* 17 March 2020. <https://doi.org/10.1001/jamahealthforum.2020.0345>.
- [3] Chen KY, Yang CM, Lien CH, Chiou HY, Lin MR, Chang HR, *et al.* Burnout, job satisfaction, and medical malpractice among physicians. *Int J Med Sci* 2013;10(11):1471–1478. <https://doi.org/10.7150/ijms.6743>.
- [4] Shaikat N, Ali D, Razzak J. Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review. *Int J Emerg Med* 2020;13:40. <https://doi.org/10.1186/s12245-020-00299-5>.
- [5] Pramesh CS, Badwe RA. Cancer management in India during Covid-19. *N Engl J Med* 2020;382(20):e61. <https://doi.org/10.1056/NEJMc2011595>.
- [6] Mummudi N, Ghosh-Laskar S, Tibdewal A, Agarwal JP. COVID-19 pandemic and nationwide lockdown - implications of the double trouble on radiotherapy practice in India. *Clin Oncol* 2020;32(10):e219. <https://doi.org/10.1016/j.clon.2020.06.004>.
- [7] Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA* 2020;323(21):2133–2134. <https://doi.org/10.1001/jama.2020.5893>.
- [8] Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, *et al.* The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020;395(10227):912–920. [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8).