Radiotherapy Technology Education in Iran: A Year after the COVID-19 Pandemic

Armin Hoveidaei (BSc)[1]*

¹Student Research Committee, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Dear Editor,

Coronavirus Disease 2019 (COVID-19) is the latest global health threat recognized for the first time in December 2019. Social distancing was announced as the most effective strategy to control the pandemic until developing a treatment, vaccine, or both [1]. This announcement led to the universities making new rules affecting the medical profession education. In Iran, students experienced an unintended temporary pause in their education which was resumed by virtual learning. Students of Bachelor of Science in radiotherapy technology (BSc. RTT) were no exception.

The major consists of two main stages, clinical and pre-clinical. While many clinical fields limited their activities to the treatment of emergency cases, RT was continued almost the same as pre-COVID-19 age, as it is a lifesaving treatment [2]. Thus the clinical-stage students of BSc. RTT had the ability to continue their learning and practice in less crowded rotation groups using personal protective equipment and the observance of social distancing. However, the theoretical content was provided through national virtual systems.

The first three years, BSc. RTT are dedicated to the pre-clinical stage, including theoretical and practical courses. The universities of the Ministry of Health and Medical Education (MOHME) of Iran have developed a virtual learning platform delivering theoretical educational content through a National Learning Management System called NAVID. This free, unlimited learning system causes the instructors to monitor the students, reposit the medical contents, manage courses, take quizzes, and facilitate checking the students' homework. Although there were some deficiencies in content preparation at the start of the pandemic, the professors of RTT adapted their educational system with the new infrastructures. In some other majors, such as medicine, Iran's Virtual University of Medical Sciences (VUMS) provided national educational content for medical doctor (MD) students all around our country. However, this university has not provided much content for BSc. RTT students. Providing national content has considerable benefits, it costs less in both money and time, and avoids duplicate work. Students can learn from the country's best professors in each field without regard to the university at which they are studying.

Virtual Learning for Practical Courses

Although virtual learning has its positive points, it is not without challenges. The most difficult challenges in BSc. RTT education are for practical courses. There is still a notable lack of virtual laboratories for this field. Most practical lessons have been postponed for the post-vaccination age. However, simultaneous learning of related theoretical and practical cours-

*Corresponding author:
Armin Hoveidaei
Student Research Committee, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran
E-mail: arminhoveidaei@gmail.com

es are inevitable. Maybe this is not only the problem of BSc. RTT education, as there is no other known commonly used virtual laboratory system in our country for other majors, as well. Reviewing the literature shows some successful experiences in virtual laboratories for students in RT fields in other countries. Jimenez et al. reported a positive experience with the Virtual Environment for Radiotherapy Training (VERT) system for their Master of Medical Physics (MMP) at the University of Sydney. They demonstrated the viability of this system for the MMP program based on three implemented practical sessions, including "RT treatment planning systems", "Anatomy for physicists" and "Linear accelerator measurements". Bridge et al. also reported an 80% positive feedback from the students after using a software-based environment, named "The Virtual Radiation Laboratory application". They mentioned that through this application, students could conduct virtual experiments using radiotherapy X-ray generators and simulated diagnosis, and it could teach students about the half-value layer, inverse square law, and radiation protection measures [3, 4]. Their expertise can develop a reliable system for medical professions' practical laboratory education.

Necessity of the Evaluation

Evaluation is an inseparable part of education. Although there are noticeable reports on the rate of medical students' satisfaction with the post-COVID-19 education condition. To the best of our knowledge, there is not any report for BSc. RTT. Insufficiencies in the knowledge about this issue lead to a difficult situation for the education stakeholders to improve the learning system.

Vaccination

Although clinical students have continued their education under new policies observation, the present situation has considerable limitations. They should be present at the hospital fewer days per week, so that there is a lower chance of COVID-19 transmission from patients to students and vice versa. This issue becomes more impor-

tant, while we notice that about one-third of cancer patients' infection is nosocomial transmission [5]. COVID-19 vaccination can help the student back to their normal education sooner. Iran has started the vaccination on February 9, 2021. Based on the MOHME announcements, the frontline healthcare workers (HCWs), such as those at Intensive Care Units (ICUs) or infection wards, have the highest priorities for vaccination. Non-frontline HCWs such as those in RT fields are in the next group. Clinical students can be considered the HCWs, but they are not sure if they will be vaccinated at the same time as the other non-frontline HCWs. If MOHME emphasizes the clinical students' coverage, it can make the situation more equitable and prevent any challenges at the injection time.

Conflict of Interest

None

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