

## THE KNOWLEDGE AND ATTITUDE AMONG MEDICAL STUDENTS TOWARD RADIATION ONCOLOGY AS A SPECIALTY IN A GOVERNMENT MEDICAL COLLEGE IN SOUTH COASTAL ANDHRA PRADESH - AN OBSERVATIONAL STUDY

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### ABSTRACT

Medical education is a continuously evolving field. Despite the radiation damage to normal cells, radiotherapy (RT) has emerged as an inevitable option for moderate-to-advanced stages of cancer. This highlights the need for radiation oncology for the growing oncology patient community. The present observational study assessed the 468 male and female Bachelor of Medicine and Bachelor of Surgery students' knowledge and attitude toward radiation oncology as a specialty at A.C. Subba Reddy Government Medical College, Nellore, Andhra Pradesh, during the period of May–June 2024. The outcome measure of this study was the participants responses to a simple, internally validated, 18-item questionnaire. Four hundred and sixty-seven students completed the questionnaire and communicated through the same medium they received. The mean age of the male and female participants was 20.47±1.42 and 20.37±1.39, respectively. Data analysis revealed that, among participants, 312 (133 males and 179 females) knew RT was part of their curriculum. However, 70 students reported never knowing it, and 143 were never assessed on their knowledge. Despite RT being the second most preferred postgraduate field, students cited a lack of awareness about career prospects and inadequate undergraduate exposure as major barriers. Students recommended early curriculum integration, increased exposure, and more RT departments in government hospitals to attract bright students to the field. The findings of the present study reveal that efforts from regulatory bodies like the National Medical Commission are essential to enhancing awareness, training, and facility standards to guide more students toward radiation oncology.

**Keywords:** Radiotherapy, Radiation oncology, Oncology, Observation study, Curriculum.

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### INTRODUCTION

Cancer, one of the most dreaded illnesses for a very long time, is frequently associated with death. In India, there are over a million new instances of cancer every year, and the country has a 67.2/100,000 mortality rate, mostly from delayed diagnosis [1]. According to estimates from the National Center for Disease Research and Information, 1.72 million instances of cancer will occur annually by 2020. Due to the delayed onset of the disease, cancer mortality rates are also predicted to increase (0.74 million in 2016–0.88 million in 2020) [2]. In recent years, significant progress has been achieved in understanding the suggested hallmarks of cancer development and treatment. Nonetheless, the 21<sup>st</sup>-century still faces challenges in the therapeutic management of cancer due to its rising occurrence. Radiation therapy, surgery, chemotherapy, immunotherapy, and hormone therapy are among the available treatment options. About 50% of cancer patients receive radiation therapy at some point during their illness, and it makes up 40% of the curative treatment for the disease. Radiation therapy is still a crucial part of cancer care. Radiation therapy's primary objective is to deprive cancer cells of their capacity for cell division and proliferation [3]. One physical agent that's employed to kill cancer cells is radiation. Ionizing radiation is the term for the radiation that is employed because it creates ions, which are electrically charged particles, and leaves energy behind in the cells of the tissues that it touches. This energy can either kill cancer cells directly or induce genetic alterations that destroy cancer cells. High-energy radiation deteriorates a cell's genetic material, or deoxyribonucleic acid, which prevents the cell from dividing and multiplying further. Radiation therapy aims to minimize exposure to normal cells that are in the radiation's path or adjacent to cancer cells while maximizing the radiation dose to aberrant cancer cells. This is

because radiation affects both cancer and normal cells [4,5]. Current initiatives, such as the National Cancer Grid, have begun mobilizing government and private sector resources to improve the infrastructure of radiotherapy (RT) centers across the nation. However, access to clinical trials and research training is limited to only a few radiation oncology centers, underscoring the urgent need to educate and train staff for effective radiation delivery [6]. Although the development of contemporary RT dates back to the late 1800s with the discovery of the X-ray, radiation oncology has seen several renaissances since its official founding six decades ago. Radiation oncology's applications have grown as imaging and therapy delivery methods have advanced. Radiation therapy is thought to be administered to about half of patients at some point following a cancer diagnosis, for purposes ranging from symptom relief to curative care. To provide the best possible application of radiation therapy and to improve treatment, close collaboration amongst oncological specialties is essential. Numerous advancements have been made in RT [7]. Even though RT necessitates the installation of large, expensive equipment, it is a simple, painless, and noninvasive treatment option. RT is a significant and helpful cancer treatment option, along with surgical oncology and medical oncology, two other oncology specializations. Roughly 20–25% of newly diagnosed cancer patients may receive multiple radiation treatments, and 45–55% will receive RT. With today's highly advanced RT technology, the procedure is safe, precise, and has few adverse effects, in addition to producing good clinical outcomes. The advancement of technologies made RT gain more popularity and attention than other medical disciplines. India has a population of over one billion, and compared to the US, where the ratio is 1:10,000, there is around one radiologist for every 100,000 people in India. Because diagnostic investigations are required

in many cases, clinical practices are becoming busier and busier. To boost the effectiveness and productivity of radiology departments, numerous hospitals have already established picture archive and communications systems and radiology information systems, and many more are in the process of doing so [8]. Despite the fact that RT is a dynamic specialty with evolving technologies and novel therapeutic offerings, it is still considered a low-priority subject in India. Medical graduates rarely choose this subject for post-graduation, and very few consider it a career option. This could be due to several factors, including the fact that there are a limited number of institutes that have recognized postgraduate (PG) courses in RT, limited job prospects, etc. However, the main factor seems to be a lack of proper exposure during undergraduate (UG) medical education due to the minimal teaching of RT in the UG curriculum. We decided to conduct a survey of UG medical students to study their awareness, understanding, and attitude toward the subject of RT.

## METHODS

### Study design

The present observational study was conducted using the convenience sampling method to study the knowledge and attitude among Bachelor of Medicine and Bachelor of Surgery (MBBS) students toward radiation oncology as a specialty in a government medical college in South-central Andhra Pradesh. The protocol of this study was approved by the respective institutional ethics committee.

### Population

This study is conducted at A.C. Subba Reddy Government Medical College, Nellore, Andhra Pradesh, during the period of May–June 2024. Four hundred healthy male and female students (age >18 years) who have completed 1<sup>st</sup>-year MBBS and are attending ward postings. Electronic informed consent was obtained from all the students before enrolling in the study. Subjects, who are unable to fill out the forms, express their unwillingness to fill out the forms, or self-report their concerns with psychological unwellness are excluded.

### Primary efficacy measure

A simple and self-validated 18-item questionnaire was used to assess the awareness, understanding, and attitude of medical UGs regarding the subject of RT and had 18 points addressing the above issues. The questionnaire was distributed in multiple-choice question format through Google Form. Each question had 2–5 choices, depending on the nature of the question, during May–June 2024. Certain questions required more than one choice to be checked, and for some questions, a short reason had to be mentioned for selecting a particular answer. 24 to June 2024. The 18-item questionnaire was presented in Table 1. The Google form link was shared either personally, through email, or through social media communications for the students of ACSR, GMC Nellore. A total of 458 students were reached by keeping 10% attrition in the response rate. Consistent efforts were made through telephonic and e-mail communications to enhance the response rate of participants. Hard copies of the questionnaires were distributed by hand or postal mail to the participants who were willing to use paper to complete the questionnaire. The respondents were asked to send the completed forms back to the authors by e-mail, post, or by hand.

### Data handling and statistical analysis

The data from respondents were collected and pooled together in a Microsoft Excel sheet. Data of participants who didn't answer the all questions were excluded. The responses for each question were assessed and results were presented for male and female participants separately.

## RESULTS

During the tenure of the present observation study, a total of 457 students completed the questionnaire. Among them, 197 males and 260 females represent 43% and 57%, respectively. The mean age of the male and female participants was 20.47±1.42 and 20.37±1.39,

**Table 1: The 18-item internally validated questionnaire used in this study**

S. No.	Question
1	Year of joining MBBS
2	Gender (Male/female)
3	Age
4	Is Radiotherapy/radiation oncology part of your MBBS curriculum? (Yes/No/I am not aware)
5	In which year are you introduced to radiotherapy as a part of your MBBS curriculum? (3 <sup>rd</sup> year/final year/Posting during Internship/never at all)
6	In what way are you exposed to radiotherapy during your MBBS tenure? (Theory only/clinical postings/both/never at all)
7	How many postings and lectures in total are assigned to radiotherapy in your college? (1–5/5–10/ more than 10/None)
8	Do you have separate postings for radiotherapy or are they merged with some other branch? (Separate/ merged with other subjects/I am not aware)
9	How are you assessed in the field of radiotherapy? (viva/theory questions/both/never assessed)
10	What is the status of radiotherapy postings during your internship? Mandatory/elective/i am not aware
11	If mandatory, please specify the duration
12	If elective, please specify the duration
13	Do you think radiotherapy is a low-priority field in the postgraduate setting? (Yes/No)
14	What would be your preference order for post-graduation for the following fields? write 1 for most preferred and continue up to 5 for the least preferred (do not tick please) Internal medicine/ General surgery/Radiotherapy-radiation oncology/Radiodiagnosis-Radiology/Pathology
15	What according to you is the reason for not choosing radiotherapy at PG Level? no proper exposure at UG level/Lack of awareness about the current status of radiotherapy/Lack of awareness about the current status of radiotherapy/ Lack of awareness about future placement prospects/if other please specify
17	What in your opinion should be done to attract bright students to this field? Increasing exposure at the UG level/creating awareness about the essentiality of this modality in cancer treatment/ setting up radiotherapy departments in more government hospitals/colleges/
18	What should be the role of NMC for improvement in course of radiotherapy? Initiate radiotherapy as a separate subject at the undergraduate level/ mandatory internship postings in radiotherapy/ introduce radiotherapy at an early stage in MBBS Curriculum/separate examination (written/oral) at any stage in MBBS

respectively. Out of 457 students, 312 members (133 males and 179 females) were aware that RT/radiation oncology is the part of their academic curriculum. Fifty-six (male 24, female 32) students answered "no" and 88 (39 males and 49 females) were answered "I am unaware". RT/radiation oncology is a part of MBBS curriculum for 305 students. Eighty-two students responded that they have introduced to RT/radiation oncology during their internship postings. Surprisingly, when questioned, "In which year are you introduced to RT as a part of your MBBS curriculum?" seventy students said, "never at all." One hundred and fourteen students reported that as part of their medical graduation requirements, they were exposed to RT during their clinical postings. Thirty-one individuals reported having theoretical exposure during MBBS. A total of 244 participants responded, sharing both

theoretical and clinical postings related to their RT exposure. 68 people indicated they never did it at all. When they inquired, "How have you been exposed to RT during your time as an MBBS student?" Regarding RT-related assignments based on lectures and posts, 188 students had more than ten, 112 had five to ten, 66 had one to five, and 91 had none at all. Participants responded with I am not aware (145 students), merged with other subjects (111 students), and distinct postings (201 students) in response to the question, "Do you have separate postings for RT or are they merged with some other branch?"

The participants' knowledge was evaluated using theoretical questions (145), viva voce (45), and both (224). There was never a knowledge assessment for 143 students. In their future PG settings, the majority of students (397) believed that RT is not a low priority topic. There are four questions separately scored by all 457 participants asking "What would be your preference order for post-graduation for the following fields? Write 1 for most preferred and continue up to 5 for the least preferred (do not tick lease)."

The ranking order of the participant preference was general surgery (227 participants) >RT/radiation oncology (170 participants) >Radiodiagnosis/Radiology (166 participants) >Pathology (118 participants).

When asked to specify, "What according to you is the reason for not choosing RT at PG Level?" the responses were: lack of awareness about future placement prospects (131 participants), lack of awareness about the current status of RT (153 participants), no proper exposure at UG level (114 participants), and other (59 participants). One hundred and ninety-four participants opted to suggest "creating awareness about the essentiality of this modality in cancer treatment". The other options chosen were "increasing exposure at the UG level (172 participants) and setting up of RT departments in more government hospitals/colleges (91 participants). "What in your opinion should be done to attract bright students to this field?" was the question.

What should be the role of NMC for improvement in course of RT?" was the question. The option to "Introduce RT at early stage in MBBS curriculum" was selected by 175 participants. The other options selected were "Initiate RT as separate subject at UG level," "mandatory internship postings in RT," and "separate examination (written/oral) at any stage in MBBS" by 147, 110 and 25 participants, respectively.

## DISCUSSION

The present observational study was conducted with 458 students using an internally validated questionnaire covering all aspects related to the students' general awareness about radiation oncology. A total of 457 participants completed the questionnaire. The obtained data suggest significant gaps in their exposure to RT/radiation oncology during their MBBS program. While 305 students had some curriculum inclusion, 70 reported never encountering it. Knowledge assessments were inconsistent, with 143 students never being evaluated. Despite RT being the second most preferred PG field after general surgery,

many students cited a lack of awareness about career prospects and insufficient UG exposure as barriers. To address this, students suggested early curriculum integration, increased exposure, and establishing more RT departments in government hospitals. These measures, alongside enhanced awareness efforts, could attract bright students to this crucial field. To the best of our knowledge, this is the first study to assess the awareness of MBBS students in a large population, including both males and females. The only limitation is that this study's questionnaire did not include the views of teachers and parents on radiation oncology. Findings of this study suggest that efforts from regulatory bodies like the National Medical Commission (NMC) are essential to enhance awareness, training, and facility standards to guide more students toward radiation oncology.

## CONCLUSION

The knowledge assessment of 457 students revealed that radiation oncology is the second most popular PG profession, after general surgery. However, many students found that there were major obstacles in the form of inadequate UG exposure and a lack of knowledge about job possibilities. Students suggested early curriculum integration, increased exposure, and the creation of more radiation oncology departments in government hospitals as remedies to these problems. These steps, along with increased awareness initiatives, may draw talented students to this important subject. The results indicate that in order to improve knowledge, training, and facility standards and eventually encourage more students to pursue careers in radiation oncology, regulatory agencies such as the NMC have to ramp up their efforts.

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