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## Introduction

Sustainability is an increasing priority in healthcare, including oncology radiotherapy. Adopting sustainable practices is essential to reduce environmental impact, optimize resource utilization, and improve departmental operational efficiency. These measures can provide significant benefits for patients, professionals and the environment. The Italian Association of Radiation therapist and Medical physics technologist (AITRO) conducted a nationwide survey to investigate the perceptions, knowledge and practices of radiation therapists (RTTs) in relation to sustainability. The study aimed to identify barriers, challenges and opportunities in order to develop concrete initiatives and promote a sustainability-oriented culture in Italian radiotherapy centers.

## Materials and Methods

The study involved an anonymous questionnaire to analyze the sustainability culture among RTTs. The questionnaire, which comprised 17 questions, was divided into five thematic sections:

- Demographics
- Knowledge and perception of sustainability
- Sustainable initiatives and measures in radiotherapy
- Barriers and challenges
- The role of AITRO

The questionnaire was distributed during the AITRO National Congress 2024 and for a fortnight via the association's social media channels. The questions included multiple-choice answers and Likert-scale statements to gather both quantitative and qualitative data. The target population consisted exclusively of RTTs working in Italy.

## Results

191 RTTs completed the survey after data validation. 14.7% of respondents had attended formal training courses on sustainability, while 17.8% had participated in sustainability-related events or congresses. Most respondents rated their environmental sustainability knowledge as moderate (median = 3 ; Q1=2 -Q3=3). A statistically significant association ( $p < 0.05$ ) was found between sustainability knowledge and participation in at least one sustainability-related session/presentation. Respondents from Northern Italy reporting higher sustainability knowledge ( $p < 0.05$ ) than those from the Centre-South. 41.8% of respondents reported that their centers had implemented sustainability initiatives, with digitalization to reduce paper consumption (25.3%) being the most common measure.



Figure 1. Types of sustainability initiatives implemented in radiotherapy centers that reported having active measures in place.

The main barriers to sustainable practices were resistance to change (3.97/5) and insufficient staff training (3.92/5), and perceptions of sustainable initiatives and actions in radiotherapy are illustrated in Figure 2. Respondents highlighted the need for training programs (68.1%) and guidelines from professional associations (67.5%).



Figure 2. Agreement levels from the Likert scale in the Sustainable initiatives and measures in radiotherapy section.

## Conclusions

The findings show limited knowledge and low participation in sustainability training among Italian RTTs. However, there is a clear need for support from associations such as AITRO through targeted training and guidelines to overcome existing barriers and promote sustainable practices in radiotherapy centers.

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