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abstract

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Bridging the AI Competency Gap: A Needs Assessment for Education in Radiation Oncology

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Introduction: Artificial Intelligence (AI) holds significant promise for enhancing efficiency, precision, and personalized treatment within Radiation Oncology (RO). However, the critical challenge to equitable global implementation lies in addressing prevalent knowledge deficits and formal training barriers. This study aimed to quantitatively assess the self-perceived AI knowledge, anticipated impact, and dominant obstacles reported by practicing RO professionals in Morocco.

Methodology: A cross-sectional survey was anonymously distributed via professional networks, yielding N=104 responses. The cohort was comprised exclusively of Radiation Oncologists (Specialists) and Residents (100.0%), exhibiting a predominantly young demographic (83.6% aged 20–40 years). Data were analyzed using descriptive statistics, alongside the Chi-squared test for independence to analyze associations between categorical variables (e.g., age and knowledge level).

Results: A significant disparity between optimism and current competency was evident: Low Knowledge & Ambiguity: Self-assessed knowledge was critically low, with 91.4% of professionals rating their competency as ‘”Average”’ or lower. Furthermore, 36.5% demonstrated a conceptual gap by misidentifying AI. Despite this deficit, professional interest was high, with 52.9% expressing a desire for specific training. The knowledge deficit was found to be uniform and independent of experience level. Analysis revealed no significant correlation between knowledge and age category (x2=8.42, p=0.49), and no significant difference was observed in knowledge level between specialists and residents. This confirms the gap spans all professional experience levels. The dominant practical obstacle cited was Insufficient Training (78.85% of respondents), exceeding Cost (67.31%). The most critical ethical concerns were Data Confidentiality (87.50%), Informed Consent (64.42%), and Algorithmic Bias (42.31%).

Conclusion: The clinical RO community demonstrates strong enthusiasm for AI but is limited by a critical, uniform knowledge deficit and definitional ambiguity. Since the primary constraint is educational accessibility, professional organizations must prioritize the rapid development and deployment of accessible, standardized training curricula that address fundamental AI concepts and mandate guidelines for ethical challenges, particularly data confidentiality, to ensure responsible integration of AI into patient care.

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