

ABSTRACT

DEVELOPMENT OF A LOCAL-BASED ADVICE RADIOTHERAPY MANAGEMENT SYSTEM FOR QUALITY AND SAFETY MONITORING OF RADIOTHERAPY PATIENTS

Ikhsan Bagatondi Nasution, 24040125225066, Universitas Diponegoro

Background: Radiotherapy requires high accuracy and safety. However, many radiotherapy facilities in Indonesia still use manual or semi-digital quality monitoring systems, which pose risks to patient safety.

Objective: This study aims to analyze the requirements for an integrated radiotherapy quality monitoring system based on the ADVICE model (Analyze, Design, Verify, Implement, Control, Evaluate) and to design appropriate features based on the perceptions of professional staff.

Methods: This research employed a quantitative descriptive survey design. Questionnaires were distributed electronically to radiotherapy professionals in Indonesia. Data were analyzed using descriptive statistics (mean, percentage, frequency).

Results: A total of 37 respondents participated, consisting of Medical Physicists (34%), RTTs (31%), Doctors, Nurses, and Administrators from private hospitals (72%), government hospitals (22%), and a specialized cancer center (3%). The main problems with current systems were: lost files (mean 2.8/5), difficulty in real-time status tracking (2.9/5), and hindered inter-unit communication (2.8/5). A total of 59,4% of respondents rated patient safety risks as high. Only 31% have a dedicated digital system. The most desired features included: a real-time dashboard (90%), a mandatory digital checklist (85%), automated final reports (85%), and QR/barcode scanning (75%). Digital FMEA was desired by 90% of respondents, with priorities on radiotherapy failure mode templates (90%) and automated RPN calculation (85%). Priority quality indicators were verification-to-first-treatment time (70%) and fractional dose accuracy (65%). Infrastructure readiness was reasonably good (shared computers 72%, stable internet 64%), but the primary concern was patient data security (67%).

Conclusion: There is a significant gap between quality monitoring needs and currently available systems. The ADVICE Radiotherapy Management system, featuring a real-time dashboard, digital FMEA, and automated quality indicators, is highly needed as a solution to enhance radiotherapy patient safety in Indonesia.

Keywords: radiotherapy, quality monitoring system, ADVICE model, FMEA, quality indicators, patient safety