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REVIEWER'S REPORT

Manuscript No.: **IJAR-53243** Date: 12-08-2025

Title: Verification of linear accelerator Quality at Oncology Center in Nouakchott by comparison with IAEA standards

Recommendation:
Accept as it is .....YES.....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality			✓	
Clarity			✓	
Significance			✓	

Reviewer Name: Mr Bilal Mir

Reviewer's Comment for Publication.

Abstract Review:
The abstract provides a concise overview of the study, starting with the clinical relevance of radiation therapy in cancer treatment and emphasizing the importance of quality control for linear accelerators in ensuring safe and accurate radiotherapy. It specifies the equipment at the National Center of Oncology, including the two photon energies (6 MV and 18 MV) available. The objective—quality verification through comparison of measured results with Treatment Planning Systems (TPS) calculations—is clearly stated. The methodology is briefly described, noting the use of ionization chambers for measuring Percentage Depth Dose (PDD) across different field sizes. The conclusion effectively states that the measured results are comparable with TPS values for all chosen field dimensions, thus validating the quality of the accelerator. Keywords are appropriate and reflect the core technical elements of the study.

Introduction Review:
The introduction sets a clear institutional and technical context by describing the facilities at the National Center of Oncology and its compliance with international standards, including oversight by the International Atomic Energy Agency (IAEA). The text briefly explains the principle of external radiotherapy and the necessity of precision in dose delivery, reinforcing the critical role of medical physicists and trained personnel in ensuring treatment accuracy. The link between accurate dosimetry and optimal therapeutic outcomes is clearly established, referencing the goal of maximizing tumor control while minimizing side effects in healthy tissue. The inclusion of citations underscores the scientific grounding of the discussion.

Scientific Content Review:
The study addresses an essential aspect of clinical radiotherapy—verification of linear accelerator performance—by focusing on the measurement and validation of PDD values. The use of ionization chambers for dosimetric measurements is standard practice and indicates methodological rigor. The

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comparison with TPS-calculated data aligns with international protocols for quality assurance. The consideration of two beam energies and multiple field sizes ensures that the evaluation covers a relevant range of clinical scenarios.

Clarity and Presentation Review:
The writing is clear, technically precise, and logically organized. Terminology such as "Percentage Depth Dose," "Treatment Planning System," and "photon regime" is used appropriately, ensuring comprehension for readers familiar with medical physics and radiotherapy. The flow from clinical relevance to methodological details is smooth, and the abstract and introduction are coherent and complementary.

Overall Assessment:
The study is relevant to the field of medical physics and radiotherapy quality assurance. It contributes practical data validating the performance of a linear accelerator against IAEA standards, with direct implications for patient safety and treatment efficacy. The methodology, scope, and conclusions are well-aligned, making the work valuable for both clinical and institutional quality control documentation.