

ABSTRACT

This study aimed to analyze the radiation exposure rate and evaluate radiation safety in a Nuclear Medicine facility through quantitative measurements to optimize radiation protection and environmental safety. Measurements were conducted over 20 days in eight key areas—SPECT-CT room, post-injection room, injection room, operator room, patient waiting room, decontamination room, waste room, and hotlab—using a calibrated Inspector surveymeter (Sn. 35654). Results showed radiation exposure rates varied between 0,046 $\mu\text{Sv/h}$ and 1.864 $\mu\text{Sv/h}$, all below the safety limit of 10 $\mu\text{Sv/h}$ (BAPETEN/ICRP standards). The decontamination room recorded the highest exposure (1.864 $\mu\text{Sv/h}$), attributed to direct handling of radioactive materials, while the operator room exhibited the lowest (0.001 $\mu\text{Sv/h}$), demonstrating effective shielding and distance protocols. Statistical analysis revealed consistent compliance with safety thresholds, with fluctuations linked to radioisotope activity (e.g., Tc-99m, I-131) and operational procedures. The study confirms the facility's adherence to ALARA principles but recommends enhanced monitoring in high-exposure areas and staff training to sustain safety standards. These findings provide a benchmark for radiation safety protocols in Indonesian nuclear medicine facilities.

Keywords: *Nuclear Medicine, Radiation Exposure Rate, Radioactive, Radiation Protection, ALARA, Surveymeter Inspector*