

ABSTRACT

Radiation protection optimization is a fundamental principle in ensuring occupational safety within radiotherapy facilities. This study aimed to analyze occupational radiation doses received by radiation workers, evaluate their compliance with regulatory dose limits, and establish a dose constraint value as part of radiation protection optimization efforts. A quantitative descriptive approach was employed using secondary data obtained from personal dosimetry monitoring records of radiation workers at the Radiotherapy Department of Dr. Sardjito General Hospital during the period of 2021–2025. The analyzed dose data were derived from Thermoluminescent Dosimeter (TLD) BARC and Optically Stimulated Luminescence (OSL) systems. Dose constraint values were determined using the third quartile (Q3) method based on the distribution of occupational doses across professional groups. The results demonstrated that all recorded occupational doses remained below the dose limits established by the Nuclear Energy Regulatory Agency of Indonesia (BAPETEN). The highest mean annual dose was observed among radiographers (0.764 mSv/year), while the lowest was recorded among medical physicists (0.579 mSv/year). Third-quartile analysis yielded the highest dose constraint value of 1.478 mSv/year for radiation oncologists. Given the relatively small variation in mean doses among professional groups, a local Diagnostic Reference Levels (DRL) of 1.478 mSv/year was established for all radiation workers. These findings indicate that the radiation protection program has been effectively implemented and supports the ALARA (As Low As Reasonably Achievable) principle in occupational radiation safety management.

Keywords: *radiation protection, dose constraint, dose limitation, radiotherapy, radiation workers, ALARA.*