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Original Article

Assessment of Indoor Gamma Radiation and Related Annual Effective Dose in Zanjan, IRAN

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Abstract:

Backgrounds and Objectives: Due to importance of ionizing radiation on human health, many studies have been performed to measure the background gamma radiation all around the world as well as some cities in Iran. According to this fact that everybody spends almost 80% of his time in indoor areas, this study was carried out to measure the amount of background gamma radiation in indoor areas in Zanjan city located in northwest of Iran to determine the annual effective dose of the city residents.

Materials and Methods: To determine the dose rate of background gamma radiation in indoors, 30 dwelling (in the main geographical directions and in the downtown areas) were selected. All of them were one floor and iron roofed. A Geiger-Muller detector (RDS-110) calibrated by Cs-137 was used in each living room of each dwellings that performed in one meter far from the earth. In 30 minute 30 values was recorded. The mean value was considered as indoor gamma dose rate in each dwelling.

Results: The mean value of dose rate in Zanjan indoor areas due to gamma background radiation was determined 146 ± 25 nGy/h. According to the results and findings in our previous study about gamma background radiation in outdoor areas in Zanjan, the annual effective dose was determined and 0.87 mSv for Zanjan city residents.

Conclusion: The annual effective dose of Zanjan city residents due to the gamma background radiation is 0.87 mSv that in comparison with UNSCEAR-2000 report is higher than the mean value for the world (0.48 mSv).

Keywords:

[Gamma background radiation](#) , [Indoor](#) , [Annual effective dose](#) , [Geiger- Muller detector RDS-110](#)

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