

## Inspiring Technologies and Innovations

<https://dergipark.org.tr/tr/pub/inotech>**Research Article**      **Evaluation the Knowledge and Radiation Protection of Radiation Workers at Ibensina Hospital**Yosef G.Ali Madec<sup>a</sup> Rezvan Rezaeizadeh<sup>b</sup> Aybaba Hançerliogulları<sup>c</sup><sup>a</sup>Sirte University Healty Faculty, Radiology Department, Sirte, Liby<sup>b</sup>University of Guilan Science Faculty, Physics Department, Rasht, Iran<sup>c</sup>Kastamonu University, Arts- Science Faculty, Physics Department, Kastamonu, TurkeyORCID<sup>a</sup>: 0000-0003-4652-2990ORCID<sup>b</sup>: 0000-0001-6219-6174ORCID<sup>c</sup>: 0000-0001-7008-480X

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**ABSTRACT:** To evaluate the knowledge and awareness of radiation worker's towards radiation protection. Each day people are effecting by Ionizing radiations. The ionizing radiation is produced several types of hazards. Thus, technicians are working at hospitals should be have good knowledge about radiation protection. In this study, the questionnaire based cross-sectional study performed at Ibensina hospitals-Sirte city, Libya between July -30August 2021 years out of 38 radiation workers. All data collected from some questionnaire and analyzed by microsoft Excel softwre surveyed. The results shows that the most age of the radiation workers are between 31 – 40 years bachelor holders 23 (76.7%), 6 male and 15 female. All radiation workers (100%) have studied primary examination while start work. However, periodical examination did not since started work (100%).

**KEYWORDS:** Radiation Protection, Radiation Workers, Ionizing Radiation and Film Badges

## 1. INTRODUCTION

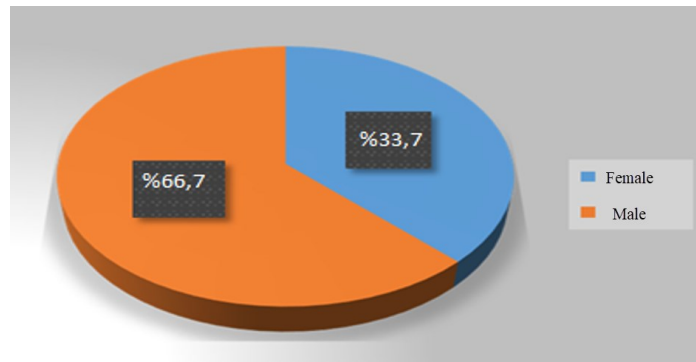
Medical imaging serves as first source of investigation and give appear to us proper diagnosis [1]. Ionizing radiation acts on living systems through indirect and direct effects. Indirect effects is interacting radiation with organic molecules and water then produced unstable free radical, whereas direct effects the biological molecules are absorbed high energy of ionizing radiation [2]. Important methods used in medicine are ionizing radiations. Which is energy in form of as alpha and beta particles or gamma and x-rays waves. The ionizing radiations have side effects and cause several kinds of cancers. That why protection applications against ionizing radiations should be applied [3]. Ionizing radiation has been found from the starting of creation, [4]. Radiotherapy, x-ray diagnostic and nuclear medicine all these examples of ionizing radiations. Radiation workers will be at risk due radiations exposures. The radiology technicians needs safety methods to prevent dangers of ionizing radiations and continues radiation measurement [4-5-6]. At the present days, medical imaging is very important for treatment and diagnosis [7-8]. In Kenya 2011 several studies have shown in difference countries to measure annual equivalent doses of radiation workers [9]. In Saudi Arabia 2017 the level of annual exposure ranged from 0.32 - 6.98 mSv [10]. For radiotherapy workers average annual effective dose found 0.28 mSv. Decreasing reasons might be due to application of international regulations for the radiation protection. The aim of this study is to evaluate the knowledge and awareness of radiation worker's towards radiation protection.

## 2. MATERIALS AND METHODS

In this study, we explored 30 samples selected randomly out of 38 radiation technicians working at Ibensina hospital Through differnt several multi choice questionnaires data was collected and by using Excial softwre surveyed data was analyzed. The study survey of radiation exposure measurements of radiation technicians in Ibensina hospital never done. Not all radiation technicians did periodic medical examinations and no radiation warning sign in work place. Most of radiation workers have poor knowledge as result about ionizing radiation. Increasing cancer mortality relative rate as result by increasing ionizing radiation exposure at low dose [13- 14]. Leukaemia hazard Estimates might be affect medical technicians exposed to X and gamma rays law doses, it useful used monitoring dosimeter [15]. Clinical indication had advised people should know to reduce radiation dose of CT scans uses in lowest possible radiation dose and limited cases of diagnostic image [16].

**3. RESULTS and DISCUSSION**

Medical radiology workers exposed to radiations should be under rules of general principles of occupational medicine as recommended by International commission on Radiation Protection (ICRP). [11]. The question are based cross-sectional study performed at Ibensina hospital-Sirte city, Libya between July and August 30 out of 38 radiation workers. Data collected from some question and analyzed by Excell simulation. The rules helpful and ensures initial and continues compatibility between radiology workers health and radiation work conditions. Thus, it gave perfect information’s in the case of occupational disease. Health conditions and work nature require medical surveillance programming for radiology workers [12]. The study survey of radiation exposure measurements of radiation technicians in Ibensina hospital never done. Not all radiation technicians did periodic medical examinations and no radiation warning sign in work place. X -rays machine calibration and Radiation survey never done. Most of radiation workers have poor knowledge as result about ionizing radiation. Increasing cancer mortality relative rate as result by increasing ionizing radiation exposure at low dose [13-14]. Leukaemia hazard Estimates might be affect medical technicians exposed to X and gamma rays law doses, it useful used monitoring dosimeter [15]. Clinical indication had advised people should know to reduce radiation dose of CT scans uses in the lowest possible radiation dose and limited cases of diagnostic image [16]. Thirty radiology technician completed primitive medical examinations since starting working. However, all radiation workers have done periodic medical test, as well as, radiology workers did not have personal monitoring devices to measuring the level of radiation exposure. As shown in table -2 periodic radiation and calibration have not done since started work. Figure-1 show that 30 radiation technicians (%33,3 male +%66.7 female) working at Ibensina hospital. At table-1 is given about radiation workers gender and working years in Ibensina Hospital at Sirte –Libya.



**Figure 1.** Radiations technician male and female distributions

**Table 1.** Male and Female Working Years

Gender	WORKING YEARS				Total	
	1-10 years		11-20 years		No	%
	No	%	No	%		
Male	8	42.1	2	18.1	10	33.3
Female	11	57.9	9	81.9	20	66.7
Total	19	100	11	100	30	100

**Table 2.** Periodic, Primitive and Radiation Protection Responsible

PRIMITIVE MEDICAL EXAMINATION	No	%
Yes	30	100
No	0.0	0.0
Total	30	100
Periodic Medical examination	-	Never done
Radiation Protection Responsible	-	NO
Supply Radiation Dosimeter	-	NO
Done x-ray machine calibration	-	Never done
Done periodic radiation survey	-	Never done

At the table-2 is given about supply radiation dosimeter and x-ray machine calibration and periodic radiation survey and primitive medical examination. At table-3 is given about radiation workers gender and working years in hospital.

**Table 3. Qualifications of Radiation Workers**

QUALIFICATIONS							
Gender	Age	Institute		University		Total	
		No	%	No	%	No	%
Male	20-30	1	100.0	2	22.2	33.3	3
	31 -40	0	0.00	6	66.7	6	66.7
	41- 50	0	0.00	1	11.1	0	0.0
	Total	1	100.0	9	100.0	100.0	9
Female	20- 30	0	0.00	3	15	15	3
	31- 40	0	0.00	17	85	85	17
	41- 50	0	0.00	0	0	0.0	0.0
	Total	0	0.00	20	100	100.0	20
	31- 40	0.0	0.00	17	85	85	17
	41- 50	0.00	0.00	0	0	0	0.0
	Total	0	0.00	0	100	100.0	20

**4. CONCLUSION**

In recent years, the opinion that the monthly and annual doses of the personnel working in the radiation and nuclear medicine departments of the hospitals are important for both their own health and their families has developed. I did not come across. The results study revealed knowledge and awareness regarding radiation protection. Healthy program for radiology workers should wear personal monitoring device and radiation department is required healthy physics candidate, safety professional and radiation technicians themselves. To follow international commission on radiation protection (ICRP) the radiation technicians should have courses about radiation risk and radiation protection. It is important for technicians during work to wear personal film badges as mentioned in international commission of radiation protection. However, all radiation workers dosent supplied with personal film badges and most of technicians each week working between 39 and 42 hours. Colibration X -rays machine and Radiation survey have not been done. Most of radiation workers have poor knowledge about radiation protection. Healthy program for radiation technicians is important. Thus, should be provide radiation workers by personal film badges and training radiation protection courses.

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