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Evaluation of the Knowledge and Radiation Protection of Radiology Technicians working at Tobruk Medical Center

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Abstract:

Background: Ionizing radiations x ray, gamma ray, alpha and beta particle emitted from natural and artificial radiation sources causes internal and external hazard. Therefore, radiation technicians should have high level of knowledge about radiation protection for patients and their self.

Aim: The aim of this study was to assess the knowledge and attitude of radiographers working at Tubruk Medical Center towards radiation protection.

Methods: The study design is questionnaire based cross-sectional study performed at Tobruk Medical Center, Tobruk city, Libya between March and June 2023.

The questionnaires covered 28 radiation technicians out of 35 workers in radiology department at Tobruk Medical Center. The answers collected and analyzed by microsoft Excel software surveyed.

Results and discussion: The results appeared 24 (85.7%) radiation technicians age between 31 – 40 years hold bachelor, 12 male and 16 female. All radiation technicians (100%) have done primary examination before start work. However, the periodical examination never done after started work for all radiology technicians

(100%). It is imperative for x-ray technicians during work to wear personal radiation dosimeter device, according to international commission of radiation protection. Unfortunately, all radiation technicians have not supplied with radiation dosimeter device. The study showed that majority of technicians stayed in work between 38 and 40 hours per week. Radiation survey and x-rays machine calibration have not ever been done. Majority of radiation technicians have inadequate knowledge and awareness about the ionizing radiation.

Conclusions: Healthy radiation protection for radiology technicians is necessary. That why should be as soon as possible provide radiology workers by dosimeter device and take training course of radiation protection.

Keywords: Training course, radiation protection, Ionizing radiation, Tobruk Medical Center, radiology workers.

Introduction

X-ray is most important source of ionizing radiation in medical field. It can be make several types of diseases. These effects may appear as a somatic effects or in next generation as a genetic effects. Measuring of occupational radiation protection is necessity whenever radiation used in the practice of medicine (1).

All of these individuals may considered radiation workers, depending on their level of exposure and on national regulations. All workers require appropriate monitoring continuously by common personnel dosimeters like film badge and thermos luminescence dosimeter. They must also receive education and training appropriate to their jobs and protect by tools and equipment (2,3). Following (ALARA) as low as reasonably achievable is important to reduce radiation patient

effects (4). The aim of this study was to assess the knowledge and attitude of radiographers working at Tubrak Medical Center towards radiation protection.

Materials and Methods

The study covered 28 radiation technicians out of 35 workers in radiology department at Tobruk Medical Center, because other radiation workers did not agree to answer the questionnaires. Through different several multi choice questionnaires data collected and by using Excel software, surveyed data was analyzed.

Results and discussion

The result appeared 28 radiation technicians working at Tobruk Medical Center 12 male (42.9%) and 16 female (57.1%) and their specifications. Such as, gender and technicians' number, as shown in figure (1).

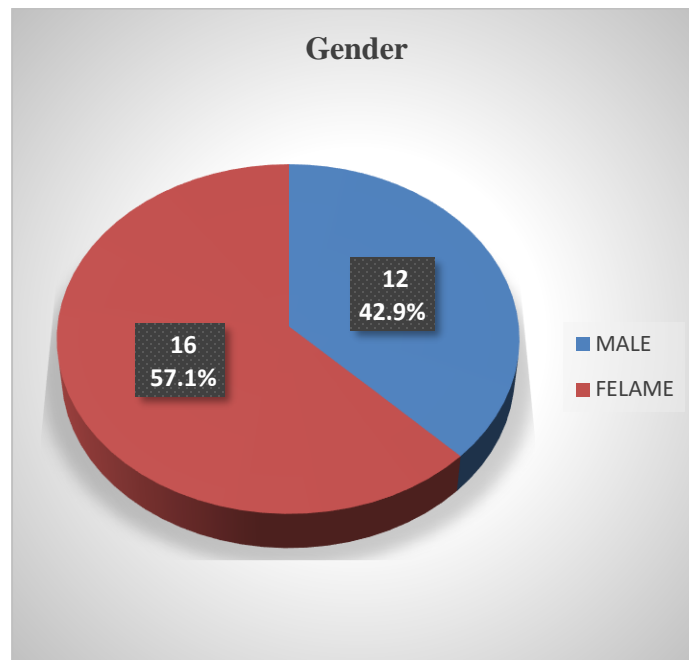


Fig. 1: Radiation technician's distributions

Majority of radiation technicians ages between 31 – 40 years, bachelor holders 24 (85.7%), 11 male and 13 female shown in Table (1).

Table. 1: Sample profile of age, gender and qualification

		Qualifications					
Gender	Age	Institute (Diploma)		University		Total	
		No	%	No	%	No	%
	20-30	1	100	2	18.2	3	25
Male	31 -40	0	0	9	81.8	9	75
	41- 50	0	0	0	0	0	0
	Total	1	100	11	100	12	100
	20- 30	2	66.7	3	23.1	5	31.3
Female	31- 40	0	0	10	76.9	10	62.5
	41- 50			0	0	1	6.2

	1	33.3				
Total	3	100	13	100	16	100

Radiation technologists working in the radiology department at Tobruk Medical Center for 1-10 years totaled 20 (71.4%), with 9 males and 11 females. also, 8 (28.6%), 3 male and 5 female, were working between 11 and 20 years, as shown in the table (2).

Table. 2: Gender and working years

		working years					
Gender	years	1-10		11-20		Total	
		No	%	No	%	No	%
Male		9	45	3	37.5	12	42.9
Female		11	55	5	62.5	16	57.1

Total	20	100	8	100	28	100
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Before beginning employment, every radiation technician at Tobruk physical Center's department of radiology had a baseline physical assessment. Nevertheless, as table (3) demonstrates, the center's radiation technicians have never performed routine radiation surveys, x-ray equipment calibrations, or annual medical assessments. Furthermore, none of the participants in this study had a personal radiation dosimeter to evaluate their level of radiation exposure, nor were they responsible for radiation protection.

Table. 3: Periodic, primitive, Radiation Protection Responsible, Supply Radiation Dosimeter, x-ray machine calibration and periodic radiation survey.

Primitive Medical examination	Num	%
Yes	28	100
No	0.0	0.0
Total	28	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	

The compatibility between radiology technician's health and radiation work conditions was maintained and the rules were used to ensure initial and ongoing

compatibility. There is no radiation technicians provided periodic medical checks and radiation warning light in the workplace. The process of radiation survey and x-ray machine calibration has not been executed due to the absence of any prior experience.

The estimate of leukemia danger may involve medical radiology technicians who are regularly exposed to x-ray and gamma ray radiation (5)

Conclusion:

Safe radiation protection techniques, such as medical surveillance and dosimeter monitoring, are crucial for technicians working in radiology facilities. Even for those who bought their own devices, training sessions are essential. Only trained personnel, safety professionals, and radiologists should have access to the radiology department.

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