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Assessment of Knowledge and Attitude of Nurses towards Ionizing Radiation During Radiography in Jeddah City, 2017

Mohammed Ali Alzubaidi[1], Huda Hamad al Mutairi[2], Soliman Mohammed Alakel[3], Hani Ahmed Saleh Al Abdullah[4], Ibrahim Abdullah Albakri[5], Saleh Fahad Abdullah Alqahtani[6]
1-Umm AlQura university,2-Qassim university, 3-King Abdulaziz University,4-King Faisal University, 5-Najran University, 6-King Khalid University

ABSTRACT

Background: The nurses working in radiation wards need to have an adequate knowledge about the risks and preventive measures of radiation exposure to protect themselves from health hazards of radiation as well as giving the patient the correct information about radiation exposure practices. Adiography in Jeddah city, Kingdom of Saudi Arabia (KSA). **Methods:** A cross sectional study was assessed among 300 nurses in Jeddah city from June 2017 to August 2017. All the nurses were interviewed then filled up a questionnaire sheet. The questionnaire included 3 parts and the first part comprised questions about the demographics of included subjects, the second and third parts included questions about the knowledge and attitude of nurses toward radiation. **Results:** The majority of nurses (65%) had adequate knowledge regarding the ionizing radiation risk factors and protective measures and about 35% had poor knowledge. The level of nurse's attitude was good among 79% and poor among 21% toward ionizing radiation. The level of knowledge was significantly associated with the level of educational degree and magnitude of practical years of experience. **Conclusion:** the nurses' radiation protection knowledge and attitude were good among most of nurses. However, there is a need for other educational safety programs to increase the knowledge of the rest of nurses.

Keywords: Knowledge, Attitude, Radiation, Nurses; Radiology, KSA.

INTRODUCTION

The medical imaging is a powerful tool for diagnosis of many diseases using Ionizing radiation. Many studies focused on the hazards of industrial radiation and the risks of medical radiation exposure were underestimated as several studies have revealed a need for radiological examination in most of patients for disease diagnosis and confirmation [1, 2]. The benefits of medical diagnostic interventions are major but have some potential risks that can't be ignored[3, 4]. The radiation has various medical hazards which increases with the increasing dose level and the exposure time to radiation [5]. The major potential effects of radiations are induction of cancer, cataracts, fertility and blood dyscrasias [6].

Decreasing the exposure time and dose a well as increasing the distance from the source could protect patients and occupational health workers. The nurses usually present at the radiology wards and theatre as they offer the health care for patients during and after radiological investigations [7]. Also, nurse's responsibilities include preparing the equipment used in radiological procedure and help patients till finishing the procedure [8, 9].

The nurses working in radiation wards need to have an adequate knowledge about the risks and preventive measures of radiation exposure to protect themselves from health hazards of radiation as well as giving the patient the correct information about radiation exposure practices[10, 11]. The lack of awareness about radiation risks is very dangerous to health thus , this study was conducted to assess the knowledge and attitude of nurses towards Ionizing Radiation during Radiography in Jeddah city, Kingdom of Saudi Arabia (KSA).

METHODS

- ***Study design***

This is a cross sectional study that was assessed among a sample of nurses in Jeddah city from June 2017 to August 2017.

- ***Study setting and population***

This study was conducted at different governmental and private hospitals in Jeddah City and included 300 nurses.

- ***Study tools***

A self-administrated questionnaire was designed and validated after reviewing the previous studies. The questionnaire was revised by 3 experts then a pilot study was conducted in 3 different random hospitals on 20 nurses for validating the questionnaire then was translated into simple Arabic. The questionnaire included 3 parts. The first part comprised questions about the demographics of included subjects, the second and third parts included questions about the knowledge and attitude of nurses toward radiation. **The study was done after approval of ethical board of King Abdulaziz university.**

Statistical analysis: Statistical analysis was performed by using software SPSS (version 22).

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Definite variables are shown as percentages and frequencies.

Ethical approval: Ethical approval was obtained from the included hospitals. A written informed consent was given from all the nurses included in the study.

RESULTS

- ***Demographic Characteristics***

The age of the included nurses was 20-30 years old among 42.4%, 25.3% aged from 31-40 years old and 32.3% aged from 41-50 years old.The majority of nurses (45%) had bachelor degree while 27% had diploma and 28% had other educational degrees. The years of experience were less than five years among 39.3% of nurses, 27.7% of nurses has 5-10 years of experience and 33% had experience level more than 10 years old (Table 1).

Table (1): Demographic Characteristics of included nurses (n=300)

Age (year)	Frequency	Percentage (%)
20-30	127	42.4
31-40	76	25.3
41-50	97	32.3
Education level		
Diploma	81	27
Bachelor	135	45
Others	84	28
Years of experience		
≤5 years	118	39.3
5-10 years	83	27.7
≥10 years	99	33

Knowledge of included subjects

The knowledge of included nurses regarding the ionizing radiation was distributed in Table 2.

Most of the nurses had adequate awareness toward the symptoms of acute radiation sickness (53%), skin injuries (64.3%), eye cataract (55.3%), bone marrow depression (51.3%) and infertility issues (59.7%).

Also, higher levels of awareness were found among 76.7% of subjects about the congenital malformations in babies delivered by pregnant women exposed to ionizing radiations.

The risk of cancers and death were underestimated among 54.7% and 62% of nurses, respectively.

In addition, the level of awareness about the protective measures was good regarding the limit on the effective dose of ionizing radiation for a radiation worker aged 18 years and above in any single calendar year is 20mSV in 81% of subjects.

More than half of nurses had good knowledge about the use of lead (55%) and apron goggles (51%) as personal protective devices for reducing radiation exposure.

On the other hand, the majority had inappropriate knowledge toward using lead gloves (54%), thyroid shield (58%) and gonad shields among 53%.

Table (2): Awareness of included nurses (n=300)

Radiation risks	Correct	Incorrect
1- Acute radiation sickness such as nausea and vomiting	159 (53%)	141 (47%)
2- Skin injuries such as erythema, skin pigmentation, dermatitis, hair loss and skin desquamation	193 (64.3%)	107 (35.7%)
3- Cataract of the eye lens	166 (55.3%)	134 (44.7%)
4- Bone marrow depression	154 (51.3%)	146 (48.7%)
5- Infertility in men and women	179 (59.7%)	121 (40.3%)
6- Congenital malformations in babies delivered by pregnant women exposed to ionizing radiations	203 (76.7%)	97 (32.2%)
7- Cancers such as skin cancer, leukaemia etc.	136 (45.3%)	164 (54.7%)
8- Death	114 (38%)	186 (62%)
Protective measures		
1- The limit on effective dose of ionizing radiation for a radiation worker aged 18 years and above in any single calendar year is 20mSV.	243 (81%)	57 (19%)
2- Lead goggles is a personal protective device for reducing radiation exposure.	165 (55%)	135 (45%)
3- Lead apron is a personal protective device for reducing radiation exposure.	153 (51%)	147 (49%)
4- Lead gloves is a personal protective device for reducing radiation exposure.	138 (46%)	162 (54%)
5- Thyroid shield is a personal protective device for reducing radiation exposure.	126 (42%)	174 (58%)
6- Gonad shields is a personal protective device for reducing radiation exposure.	**141 (47%)**	**159 (53%)**

Level of awareness:

The majorityof nurses (65%) had adequate knowledge regarding the ionizing radiation risk factors and protective measures and about 35% had poor knowledge (Table 3).

Table (3): nurses' awareness about ionizing radiation

Level of knowledge	Frequency	Percent (%)
Poor	105	35
Good	195	65
Total	300	100

Attitude of included subjects

The attitude of nurses was good toward the hazardous effects of radiation (88%) and 77% had positive attitude toward using personal protective devices for reducing the radiation exposure.

Also, most of nurses had positive attitude toward the importance of the periodical monitoring the level of radiation (62.3%) and 92% will read the safety radiation policy (Table. 4).

Table (4): Attitude of nurses toward ionizing radiation (n=300)

Do you think radiation is hazardous?	**No.**	Percentage (%)
Yes	264	88
No	36	12
Will you use personal protective device for reducing radiation exposure		
Yes	231	77
No	69	23
Is periodical monitoring the level of radiation important?		
Yes	187	62.3
No	113	37.7
Will you read the safety radiation policy?		
Yes	276	92
No	24	8

Assessing attitude level:

The level of nurse's attitude was good among 79% and poor among 21% toward ionizing radiation as presented in table. 5.

Table (5): nurses' attitude toward ionizing radiation

Level of attitude	Frequency	Percent (%)
Poor	63	21
Good	237	79
Total	300	100.0

Association between subjects' knowledge and demographics:

The level of knowledge was significantly associated with the level of educational degree and years of experience. However, the age showed no association with the good knowledge (Table. 5).

Table 5: Association between knowledge of ionizing radiation and demographic variables

	Good (n=195)		**Poor (n=105)**		P-value
Age (year)	**No.**	**%**	**No.**	**%**	
20-30	82	42.1%	45	42.9%	0.332
31-40	49	25.1%	27	25.7%	
41-50	64	32.8%	33	31.4%	
Education level					
Diploma	59	30.2%	22	21%	0.001*
Bachelor	96	49.2%	39	37.1%	
Others	40	20.5%	44	41.9%	
Years of experience					
≤5 years	47	24.1%	71	67.6%	0.001*
5-10 years	62	31.8%	21	20%	
≥10 years	86	44.1%	13	12.4%	

DISCUSSION

A high level of knowledge and attitude were found among most of the nurses toward radiation hazards and protection. This was in the same respect with a present study that was conducted among health care workers toward ionizing radiation which showed good knowledge among most of respondents but with poor protective practicing techniques [(12)]. Also, in Nigeria, a high level of knowledge was found among radiographers regarding the dangerous effects of ionizing radiation [(13)].

On the other hand, the knowledge was moderate among the nuclear medicine nurses toward radiation safety in Malaysia[(14)].Another study indicated that the knowledge of nurses toward radiation safety and hazards was insufficient [(10)]. The level of knowledge was significantly associated with higher experience years and educational degree. The higher educational degree and more levels of experience would increase the knowledge and protection procedures among nurses [(15)].

There is a lack of studies regarding the knowledge and attitude of nurses toward ionizing radiation in Saudi Arabia. Thus, this study had some limitations of time, sample size and the lack of studies among nurses that could be comparable with the present results.

CONCLUSION

The nurses' radiation protection knowledge and attitude were good among most of nurses. However, there is a need for other educational safety programs to increase the knowledge of the rest of nurses.

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