

An Assessment of Knowledge of Nurses Towards X-Radiation During Operation Theatre And Ward Radiography in Private Hospitals In Villupuram District, Tamilnadu

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Abstract- *This study aimed to assess the knowledge of Nurses towards X-Radiation during operation theatre and ward radiograph working in private hospitals in Villupuram district, Tamilnadu, India. A questionnaire is formulated to retrieve relevant demographic data and quantitative data about the knowledge regarding the X radiation and its effect. The questionnaire was derived from previous study. The questionnaire consists of both open ended and closed ended questions. Majority of the nurses shows their interest in participation of this study. About 90 nurses from various private hospitals in Villupuram district participated as respondent. The study shows that knowledge of nurses towards X-Radiation working in private hospitals in Villupuram district was adequate. Gender, age, qualification, experience were correlated with the knowledge towards the Radiation effect. Comparatively the experienced nurses were having more knowledge towards radiation protection of X-Radiation. Compare with the qualification, the PG and UG qualified nurses are much aware of the effect of radiation. The overall knowledge can be improved by continuous awareness programme and training.*

Keywords- X-Radiation, Knowledge, Nurses , Ward, Theatre , Radiography.

I. INTRODUCTION

In our environment radiation has always been present in various forms .However, mankind was not directly aware of its existence until the scientific discoveries were made [1]. The media is aggressive and exaggerated the risk of radiation awareness among the people. It creates several misconception, confusion and erroneous beliefs that exist with regard to medical radiation hazards. Studies shows that most people underestimate the risk of medical radiation application and overestimate the risk of industrial radiation [2].

In medical imaging X radiation is considered as one of the powerful diagnostic tool.[3]. Several studies have revealed that many doctors have reported that to complete their diagnosis they always sent their patients for a radiologic examination [4]. Although all medical interventions have potential benefits, but it's potential risks should not be ignored [3].

The potential risks of radiation depend on the biological effect of radiation. The biological effect of X-Radiation can be classified into two categories namely Somatic effect and genetic effect.

Somatic effect arise from damage to somatic cells and affect only the exposed individual. The acute whole body exposure to low LET (Linear Energy Transfer) radiation causes Early somatic effect such as chromosomal aberration, NVD syndrome, gastrointestinal syndrome and central nervous syndrome. Exposure to low level of radiation over a prolonged period may lead to late somatic effect. Late effect are characterized by latent period which can be as long as 30 years. The important late somatic effect are cataract and cancer.

Genetic Effect result due to damage to reproductive cells and manifest in the progeny of the exposed person. Only the amount of radiation dose to reproductive organs, which occurs up to the time of conception, can affect the general characteristics of the offspring.

Both somatic and genetic effect of radiation can be classified into deterministic effect and stochastic effect. All somatic effects except cancer, are deterministic effects of radiation. All these effects will definitely appear in the exposed individual, if the radiation dose received is above the respective threshold doses. As such deterministic effect can be

completely avoided by limiting the dose levels well below the threshold doses.

Genetic effect and induction of cancer are stochastic effect of radiation. Induction of stochastic effect is of random or statistical nature. Hence the risk of stochastic effect cannot be completely avoided. However, it can be minimized to an acceptable level. Therefore, before undertaking any radiological examination, it is important that the physician, radiologist and radiographer all understand the potential risks of radiation and also its advantages or benefits to the patients [5].

Reduction of exposure time, increasing distance from source, and shielding of patients and occupational workers have proven to be of great importance in protecting patients, personnel, and members of the public from the potential risks of radiation [5]. These three radiation protection actions of "time-distance-shielding" are the triad of radiation protection. Radiation protection is a general term applied to the profession or science related to protecting man and the environment from radiation hazards.

Nurses posted to the radiology department and those in the wards and theatre where radiography procedures are done, offers professional care to patients before, during and after radiologic procedures. They help to book reassure and prepare patients for special radiologic procedures and as well provide after care to patients after the procedures. Nurses also help to support the patient during the procedure and also prepare the equipment and instruments needed during the examination. Nurses working in departments, units or wards where ionizing radiation take place need to be knowledgeable about radiation and radiation protection practices so as to be able to give the patient the rightful information and protect themselves as well as the patients and the general public from unnecessary radiation exposure.

The researchers observed that during radiographic examinations on the ward, some nurses are extremely afraid to stay within the vicinity during radiation exposures, or just move some distance away but on sitting the radiographer with the mobile X-ray machine on the ward, they leave you with the patient and do not even want to come closer and help in lifting the patient even while no exposure is going on, and despite the reassurance and radiation protection measures employed by the radiographer. These reactions of some nurses towards ionizing radiation and the need to understand why they behave differently prompted the researchers' interest to find out the level of knowledge on ionizing radiation and radiation protection. This study aimed to assess the knowledge

of nurses towards radiation protection during ward and theatre radiography.

II. MATERIALS AND METHODS

Data Collection

An introductory cover letter was provided for the respondents to introduce researcher. The purpose and proposed benefits of the study were explained to the participants. The confidentiality of the participant was assured. The researcher visited the private hospitals and invited the Nurses to participate in the study. Some of the Nurses who agreed to participate in the study signed the consent form and completed the questionnaire at the same time. Some of the participants requested one or two days to complete the questionnaire. Respondent were left on their own to complete questionnaire and are collect by the researcher within a week. The data are collected from october 2017 to Decembere 2017.

Study Design and permission

The study used a descriptive study design utilizing a questionnaire to collect Data. The permission to carry out the study was obtained from the hospital managements. Each participant signed a written informed consent as a pre request to participate the study.

Inclusion

Nurses who are working in private hospitals in Villupuram district.

Exclusion

Nurses who are not working in private hospitals or working in Government hospitals and others who refused to participate in the study was excluded.

Sampling method and Sample Size

A convenient sample was used based on availability and willingness to participate in the study. Totally 100 questionnaire are distributed among the Nurses working in various private hospital in Villupuram district.

Instrument for Data Collection

Data was collected through questionnaire, which was derived from previous studies. The questionnaire mainly consist of closed ended questions. Some questions were

designed as open ended questions to allow the respondent to comment freely.

Section A consisted of demographic data and Section B consisted of items on knowledge towards radiation protection during radiography. Data was collected for a period of three month and analyzed using statistical package for social sciences (SPSS), and presented using frequency distribution tables and percentages. Informed consent was sought from all the participants and acceptance to participate in the study was considered as consent. Confidentiality of the data collected was maintained as no name of any nurse was mentioned in the research.

III. RESULTS

A total of 100 questionnaires were distributed and 90 were filled and returned within a period of three month giving a response rate of 90%. The study found that female respondents were 72 (80%) while male were 18 (20%). The respondents age ranged from 21 to 46 years and above with a mean age of 26.5 years. Respondents with the age group of 26-30 years had the highest while those within the age group of 46 and above had the least frequency. Most of the nurses 45 (50%) had diploma as their highest level of qualification followed by Under Graduate Degree holders who were 36 (40%). Only 9 nurses (10%) had a Post Graduate Degree. In years of experience, 40 (44.44%) had practiced for 0-5 years while 11 (12.22%) had practiced for 16-20 years.

Table 1: Demographic variables of the respondents

Variable		No. of Respondent	Percentage (%)
Age (Years)	21-25	13	14.5
	26-30	27	30
	31-35	18	20
	36-40	9	10
	41-45	14	15.5
	Above 45	9	10
Gender	Male	18	20
	Female	72	80
Qualification	Diploma	45	50
	Under Graduate	36	40
	Post Graduate	9	10
Working Experience	Up to 5 yrs	40	44.44
	6-10 yrs	13	14.44
	11-15yrs	14	15.56
	16-20 yrs	11	12.22
	Above 20 yrs	12	13.33

Table 2 : Nurses BASIC knowledge towards radiation

ITEMS	YES		NO		DON'T KNOW		TOTAL	
	No.	%	No.	%	No.	%	No.	%
Staying away from patient during exposure	68	75.56	19	21.11	3	3.33	90	100
Use lead apron during radiographic exposure.	70	77.78	16	17.78	4	4.44	90	100
Coming to the vicinity after x-ray exposure	36	40	45	50	9	10	90	100

Table 3 : Nurses knowledge towards radiation

ITEMS	YES		NO		DON'T KNOW		TOTAL	
	No.	%	No.	%	No.	%	No.	%
Radiation can cause harmful effects	72	80	15	16.67	3	3.33	90	100
Radiation can cause harmful effects	15	16.67	71	78.88	4	4.44	90	100
Radiation that is used in wards and theatres are more dangerous than those in the radiology department	24	26.67	50	55.56	16	17.77	90	100
Radiation is used for boosting the immune system	12	13.33	67	74.44	11	12.23	90	100
Generally we receive radiation in our everyday life	66	73.33	21	23.33	3	3.34	90	100
The lifespan of radiology workers are less compared to other health workers	44	48.89	26	28.89	20	22.22	90	100
Objects in the room emit radiation after an x-ray exposure	38	42.22	26	28.89	26	28.89	90	100

Table 4 : Cross tabulation educational level against BASIC knowledge towards radiation

ITEMS	Diploma		Under Graduate		Post Graduate	
	No.	%	No.	%	No.	%
Staying away from patient during exposure	30	66.67	29	80.56	9	10
Use lead apron during radiographic exposure.	31	68.89	30	83.33	9	10
Coming to the vicinity after x-ray exposure	18	40	18	50	9	10

Table 5 : Cross tabulation professional experience against BASIC knowledge towards radiation

ITEMS	<5 yrs		6-10 yrs		11-15 yrs		16-20 yrs		>20 yrs	
	No.	%	No.	%	No.	%	No.	%	No.	%
Staying away from patient during exposure	28	70	9	69.23	10	71.43	9	81.82	12	100
Use lead apron during radiographic exposure.	27	67.5	10	76.92	11	78.57	10	90.91	12	100
Coming to the vicinity after x-ray exposure	11	27.5	8	61.54	8	57.14	8	72.73	10	83.33

IV. DISCUSSION

A total of 100 questionnaires were distributed and 90 were filled and returned within a period of two month giving a response rate of 90%. The study found that female respondents were 72 (80%) while male were 18 (20%). The respondents age ranged from 21 to 46 years and above with a mean age of 26.5 years. The higher number of female participants could perhaps be because the nursing profession is viewed as a female profession and dominated by them. This is in agreement with a study by Alotaibe and Saeed [6] and Maliro [7] who also found higher frequency of female.

Most of the nurses 45 (50%) had diploma as their highest level of qualification followed by Under Graduate Degree holders who were 36 (40%). Only 9 nurses (10%) had a Post Graduate Degree. These findings were similar to that of Alotaibe and Saeed [6] who found that most of the nurses had diploma as their highest qualification. This could be because there are more diploma awarding nursing institutions than those awarding bachelors of nursing sciences degree (BSc) and master's degree (MSc) as obtainable within the study locality.

In years of experience, 40 (44.44%) had practiced for 0-5 years while 11 (12.22%) had practiced for 16-20 years. The participants had good knowledge of ionizing radiation and about 60.4% knew the source, benefit and the potential harm of ionizing radiation. This is probably due to general knowledge about radiation and its associated hazards. These findings are in agreement with that of Rassin et al. [4], who found that majority (70%) of the nurses had average knowledge on radiation. However studies conducted by Alotaibe and Saeed [6] and Maliro [7] revealed that nurses

lack knowledge on radiation sources and radiation protection methods.

The study also found that the respondents had positive (good) attitude towards ionizing radiation during theatre and ward radiography, whereas 70 (77%) of them practice good radiation protection by shielding (use of lead apron) and keeping distance from patients during radiographic exposures. This is perhaps because of the fear of radiation motivating them either ignorantly or intentionally to adopt good radiation protection practices. This findings are different from that of Rassin et al. [4] who found that though there was an average knowledge on radiation, most of the participants do not follow radiation safety methods.

The study found that the level of education attained by the participants in this study, impacted positively on their attitude towards radiation protection because good radiation protection practice increased as the participants' level of education increased as seen in this study. This might be as a result of the increased information due to higher level of exposures that might come as a result of increased level of education. This finding are not similar to that of Alotaibe and Saeed [6], Maliro [7], and Urushizaka [8] who found that there is no influence of level of education on attitude of nurses towards radiation protection.

This study also revealed that as participants' years of practice increased, their attitude towards radiation also got better. This might be because of the abated fear and misconceptions about ionizing radiation that may accrue over the length of years of practice. This is not in agreement with to the findings of Alotaibe and Saeed [6] and Maliro [7], who found that years of professional practice did not affect the attitude towards radiation. However, geographical location, place and nature of practice should not be ignored as this could also impact on their attitude towards ionizing radiation.

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VI. CONCLUSION

Findings from this study showed that participants had good knowledge towards ionizing radiation during theatre and ward radiography and this was influenced by the level of education attained and years of professional practice, however,

more needs to be done to improve on the curriculum content on ionizing radiation in the nursing institutions and nurses should also be encouraged to pursue further studies to meet up with the current trend of evidence based practice. I recommend seminars and symposium on a regular basis within the hospitals to educate all the staff on radiation protection.

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