

## Radiation Safety Awareness among Radiation Workers and Clientele At Mulago Hospital, Kampala, Uganda.

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**Background:** All x-ray utilization in human medicine leads to exposure of the patient and personnel to radiation. Although the quantity is low in diagnostic examinations, special attention should be given to this fact in order to minimize unnecessary exposure for both groups. Exposure to ionizing radiation cannot be avoided in a medical imaging facility. Twenty-two radiation workers and fifty patients responded. The main objective of the study was to determine the level of radiation safety awareness among radiation workers (Personnel) and clientele at Mulago hospital.

**Methods:** Subjects were interviewed using two different questionnaires each one tailored to the radiation workers and the patient (clientele). Fifty patients and twenty-two radiation workers responded. Their views were assessed using structured questionnaires. The data was analysed using SSPS package.

**Results:** Fifteen (68.2%) reported that they had had a sensitization introduction about radiation safety before they started working with radiation. . 18 (81.8%) thought that the radiation safety measures taken at the work place were inadequate. It was noted that radiation workers were well informed about radiation safety, but that the patients expressed ignorance on the subject and many were convinced that x-rays were dangerous.

**Conclusion:** There is need for sensitization of the public on radiation safety and to allay their fears about radiation. The radiation workers should do this before patients are worked on. This requires good communication skills on the part of the radiation workers.

There is also need for radiation workers to have introductory seminars on radiation safety before they start working with radiation. They also need continuous education and update on radiation safety

### Introduction

All x-ray utilization in human medicine leads to exposure of the patient and personnel to radiation. Although the quantity is low in diagnostic examinations, special attention should be given to this fact in order to minimize unnecessary exposure for both groups<sup>1,2</sup>. The radiation worker determines most of the factors associated with exposure to the patient, though some are intrinsic within the patient like thickness and density<sup>3,4</sup>.

At the same time radiation workers are also exposed to x-rays during the process of working. Though medical utilization of x-rays has been practiced in Mulago Hospital for a long time, more work needs to be done in the area of radiation safety. With this in mind, we set out to study the radiation safety awareness among the patients and personnel at Mulago hospital.

### Materials and Methods

The main objective of the study was to determine the level of radiation safety

awareness among radiation workers (Personnel) and clientele at Mulago hospital. People were interviewed using two different questionnaires each one tailored to the radiation workers and the patient (clientele). Fifty patients and twenty-two radiation workers responded. The data was analysed using SSPS package.

### Results

The patients' ages ranged from 16 to 87 years with a mean of 38 and median of 37 years. Twenty (40%) of the patients had education up to secondary school level while 17 (34%) had only primary education. Only 9 (18%) had a degree or diploma; 4 (8%) had no formal education. Eleven (22%) of the patients came for x-ray examinations, 8 (16%) for ultrasound, 5 (10%) for fluoroscopy and 7 (14%) for both x-ray and ultrasound while 5 (10%) had come for computer tomography (CT). Twenty six (52%) of the patients were visiting the department for the first time, 12 (24%) for a second visit, 12 (24%) for a 3<sup>rd</sup> or more times.

Twenty (83%) of the 24 patients who had visited the department before, were visiting for

the second or third time. Thirty nine (78.%) of the patients reported they would not ask for an x-ray themselves. Thirty six (72%) reported they could not refuse to have an x-ray if it was requested by their doctor. There was an equal distribution (43% each) of patients who thought that x-rays were dangerous and those who thought that they were not dangerous; 7 (14%) did not know. Half (50%) reported that x-rays reduce or affect the life span in some way. The majority (83.3%) had no idea on how to protect themselves from radiation. A total of 43 ( 86%) knew that x-rays were invisible while 7 (14% ) thought they were visible; 95.7% did not know the radiation symbol.

Thirty three (66%) did not mind standing in areas where there was radiation while 30 (60%) said they would not feel comfortable working with radiation. Twelve (24%) did not mind. Forty six (92%) expressed the desire to know more about radiation mainly from medical workers. None of the patients knew about background radiation.

Twenty two radiation workers responded. Their ages ranged from 24 to 55 years with a mean of 36 and a median of 34years. Nine (40.9%) were Degree holders, 6 (27.3%) had diplomas, 5 (22.7%) had certificates, and one (4.5%) had had secondary education.

**Table 1.** Level of Education of workers

LEVEL OF EDUCATION	NUMBER	PERCENTAGE
Graduates	9	40.9
Diploma Holders	6	27.3
Certificate Holders	5	22.7
Secondary Education	1	4.5

Duration of hospital employment varied from 2 – 30yrs with a mean of 9yrs and mode of 6yrs. Eleven 50% worked with diagnostic radiation alone, 4 (18.2%) with therapeutic radiation and 7 (31.8%) with both.

Only one worker expressed ignorance on the type of radiation safety measures taken at his work place. Others sited shielding, time and distance as the methods used, 19 (86%) expressed that personnel radiation monitoring was carried out regularly at their work place and 17 (77%) stated that work area monitoring was

done regularly at the work place. One (4.5%) expressed ignorance. Seven (86.4%) said they had had some form of training on radiation safety while 5 (13.6%) had had none.

Fifteen (68.2%) reported that they had had a sensitization introduction about radiation safety before they started working with radiation. . 18 (81.8%) thought that the radiation safety measures taken at the work place were inadequate. They suggested that protective wear be increased in number, have regular monitoring of working places, genital shields be provided, radiation protection workshops, teachings and seminars be carried out. Equipment should be monitored and if old should be replaced.

## Discussion

Radiation safety is a vital component of protective measures taken at any hospital that has diagnostic radiological and radiotherapy equipment<sup>5,6</sup>. Most of the respondents in this study were visiting the department of radiology for the first time. A large number of the patients were of the view that x-rays were dangerous while some thought they were not dangerous. It was noted that a large number of the patients were ignorant of the radiation symbols and this implies that they could innocently walk into a radiation field. Many did not mind standing in areas where they could be exposed and saw no danger working with radiation.

Despite this ignorance many were willing to learn more about radiation and they preferred this to be done by the medical workers. Patients thought direct dialogue with the radiation worker was the best and most effective source of information. The challenge for the radiation worker is two fold. To develop communication skills so that they can effectively inform the patient without arousing unnecessary fear and at the same time alleviate their fears. At the same time to devote time to safety issues in view of the overwhelming number of patients.

Most of the radiation workers were young well-educated people who had worked for a reasonable length of time in the department of radiology. Most of them were working with radio diagnostics. It was noted that a large number had received some form of training in radiation safety although few had got an introductory sensitization at the time they joined the department. Many of them recommended

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that there was need for more monitoring at their places of work.

### Conclusion

- There is need for sensitization of the public on radiation safety and to allay their fears about radiation. The radiation workers should do this before patients are worked on. This requires good communication skills on the part of the radiation workers.
- There is also need for radiation workers to have introductory seminars on radiation safety before they start working with radiation. They also need continuous education and update on radiation safety.

### References

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