

Measuring Awareness of Workers and Patients of the Importance of Safety Measures and their Impact in the Radiation Department

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Abstract

This study assesses worker and patient awareness of the significance of safety measures, as well as their effect, in Taif. The experimental strategy proposed for achieving the study's goals with using a questionnaire. The sample was selected from the Children's Hospital is 123 divided into 81 patients and 42 workers. There are 20 questions in total: 10 for patients and 10 for staff. The researcher used Google Form to statistically analyses the data collected from the patients and workers after receiving their responses. The results revealed that the majority of the patients in this study were aware of the benefits of safety protective precautions and their effects, such as the need to remove metal pieces before exposing to radiation, the impossibility of exposing a pregnant woman to radiation, and television radiation is appropriate for the fetus. They even know what to do if they hear the ORANGE alert. However, responses to concerns about radiation damage that occurs outside of the radiation room and whether radioactive material are harmful to those that come into communicating with the patient it varied. Besides, the findings have revealed that staff in the radiology department are aware of the importance of wearing the lead apron correctly, and the patient's mate in the radiology unit. As well as the patient undergoing a Nasal Bone scan must wear the Thyroid Gland Shield. Furthermore, the workers are familiar with the word ALARA and have shown that it is important to notify the patient of the whole scan process.

Keywords: Workers; Patients; Safety Measures; Radiation Department

Introduction

Radiation protection in many departments, including radiology, is essential for patients, doctors and staff. In the world of medicine, the use of ionizing radiation is an indispensable instrument used for the diagnosis and treatment of various medical conditions. As the use has varied, both patients and treatment practitioners have many doses of lifetime radiation. Radiation safety is intended to mitigate the damaging effects of ionizing radiation in order to limit excessive radiation exposure. Formal preparation for radiation safety aims to reduce care personnel and patients' radiation exposure.

RPC refers to a collection of beliefs, priorities, regulations, and procedures related to radiation protection. An RPC program's foundation is a complex framework that requires ongoing assessment and systematic change using quantitative and qualitative methods to assess how well the RPC is being applied and whether the program is meeting its objectives. RPC should be a regular aspect of clinical practice, and it necessitates a thorough understanding of radiation hazards, safety regulations, and constructive involvement from all

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stakeholders [1]. The risk of excessive exposure to radiation is not negligible and could result in a number of health problems, from cataracts, hair loss, birth defects, and cancer. Consequently, it is beneficial for both patients and health professionals to follow the latest radiation management standards [2].

To raise the environment and awareness of workplace safety, topics relating to its significance and priority should be included in educational curricula, followed by orientation and in-service preparation following graduation. Thus, rather than raising safety awareness while working, better working environments will be accomplished by workers with proper occupational safety awareness upon completion, and awareness will be further improved by ongoing training activities after graduation [3]. Radiation hazard awareness and expertise can vary depending on the occupational responsibilities, level of experience, and also nationality of healthcare professionals. The current results showed that the current survey, on average, had a high degree of knowledge about radiation hazards. When working in conditions including radiation exposure, the majority of the participants reported wearing safety equipment. These results highlight the importance of improving anesthesia personnel's and surgical subspecialists' understanding and knowledge of radiation hazards [4]. Since the strongest correlations were observed between safety education and safety citizenship behaviour as opposed to other aspects of safety awareness, education and preparation should be prioritized. Results also showed that low levels of safety citizenship behaviour were mainly among female workers, poorly-educated workers, and overworked workers of both genders. Particular attention needs to be given to these three groups of workers [5]. The standard of conformity with safety precautions was generally acceptable. Occupational health and safety laws, guidelines, and policies seek to improve the environment for employees, coworkers, family members, consumers, and other stakeholders. A potential cause of harm or adverse health effects on an individual or individuals as a result of the work one does or the atmosphere in which one works is referred to as an occupational hazard. Occupational safety is concerned with possible safety threats that could result in injuries to the worker, while occupational health is concerned with potential health risks associated with a certain type of job [6]. The radiation safety training given to doctors by various health facilities was insufficient and unsuccessful. The overall mean score of 5.3 per cent indicates that physicians' experience and understanding of radiation safety remains poor. Basic radiation knowledge and understanding of biological effects among physicians, especially in staff and patient protection, are recommended through training courses.

Future major studies are proposed to assess radiation expertise and sensitivity around the world, including all health care staff of various specialities, and we highly advise that the subject be included in the undergraduate curriculum in medical specialities [7]. The bulk (80%) of occupational health safety measures were available in the radiology department of a chosen hospital, indicating that health care workers in the department were knowledgeable of occupational health safety. The steps are taken to ensure radiation protection is well known to the respondents. And if the team were knowledgeable of radiation protection, it is always a good idea to keep them up to date. They should be informed about radiation protection on a daily basis. Before they begin dealing with radiation, radiation personnel may attend introductory workshops on radiation protection. They may also receive ongoing radiation protection training and updates [8]. For both healthcare practitioners and patients, a lack of information in applications that require radiation is a critical parameter in radiation safety. Even in occupational classes that operate in a radiation field on a regular basis, the current research revealed a lack of understanding and sensitivity about radiation safety. All of the required requirements must be met in order for all hospital staff to operate safely in radiation-related applications. This will mean that all staff and patients, as well as their families, are subject to the least amount of radiation available [9].

A review of the literature reveals that research on this subject is mostly conducted in the automotive and construction industries. There aren't many studies in the healthcare sector. It is suggested that further research be conducted in this area. So, according to the previous studies, the researchers aim to measure the awareness of protection measures.

Materials and Methods

To address the study question, the researcher used an experimental approach method to explore the awareness of patients and workers of safety measures and their impacts in the radiation department at Children's hospital. In 2021, the researchers used a questionnaire

to collect the data, then they used Google Form to statistically analyze the responses of the questionnaire. The sample is 123 participants divided into 42 workers, 81 patients of both genders (Male and Female). This study was applied among radiation staff at Children’s hospital. The study takes place for 5 weeks. the researchers applied two questionnaires; one for measure the awareness of safety measures of workers and another one for measure the awareness of safety measure of patients. Both questionnaires were done at the same time.

Limitation of the Study

Shortage of time, the precautionary precautions for the Corona epidemic have made and created difficulties in writing. Difficulty in reaching workers in the radiology department

Results

This study concluded that most of the patients in the radiology department have knowledge that radiation causes harm to the human body, they have knowledge of the reason for removing metal pieces before they are exposed to the rays, and they also have knowledge about the risk of exposing a pregnant woman to radiation. In addition, more than half of the patients have knowledge that television radiation is safe for the fetus, and most of them have knowledge of the procedures required when hearing the ORANGE code, the appropriate procedure in the event of cardiac stents and MRI scan. However, the responses differed about knowing whether the radiation damage reaches the person in the waiting room, and about knowing whether the dye causes harm to the human body or not, and the responses also differed about whether the radioactive substance poses harm to the people in contact, as it turned out that the workers in the radiology department Knowledge about the necessity of requesting the patient’s facilities in the radiology room to wear the Lead Apron and it was also found that the workers have knowledge about the necessity to wear the lead Apron well sand it was found that the workers have knowledge of the necessity to wear the patient in the Nasal Bone X-ray examination to wear the Thyroid Gland Shield. As well as the knowledge workers have About the settings for the x-ray image quality. The questionnaire also shows the workers’ knowledge of the term ALARA. Most of them inform the patient of the full examination procedure. Most of them deny the high sensitivity of the brain to radiation.

The responses indicate that the most sensitive group of radiation is children first, then nursing mothers, then the elderly. The questionnaire shows that most workers have the knowledge that it is necessary to verify complete patient data before the examination. In the event that the x-ray is not clear, most of the responses indicated to the workers that they must change the quality factors to reach the appropriate image quality.

Discussion

The first questionnaire for workers



Figure 1

Figure 1 showed the responses of the first question of workers questionnaire that it got 42 responses which indicated that 73.8% of responses of total answered with Yes, I do that. Whereas 26.2% of responses totally answered with No, there is not necessary.

73.8% refer to workers who know the necessity of asking a patient's mate to wear Lead Apron, but 26.2% refer to workers who do not know the necessity of asking the patient's mate to wear Lead Apron.

That means more than half of the total have known the necessity of asking the patient's mate to wear Lead Apron. The majority of the participants reported wearing safety equipment [4]. As the majority of the respondents (83.7 per cent) were mindful of the workplace health and safety measures [8].



Figure 2

Figure 2 showed the responses of the second question of workers questionnaire that it got 42 responses which indicated that 64.3% of responses of totally answered with Yes. Whereas 35.7% of responses totally answered with No, there is not necessary.

64.3% refer to workers who know the necessity of wearing Lead Apron, but 35.7% refer to workers who do not know the necessity of wearing Lead Apron. That means more than half of the total have known the necessity of wearing Lead Apron. The majority of the participants reported wearing safety equipment [4]. As the majority of the respondents (83.7 per cent) were mindful of the workplace health and safety measures [8].

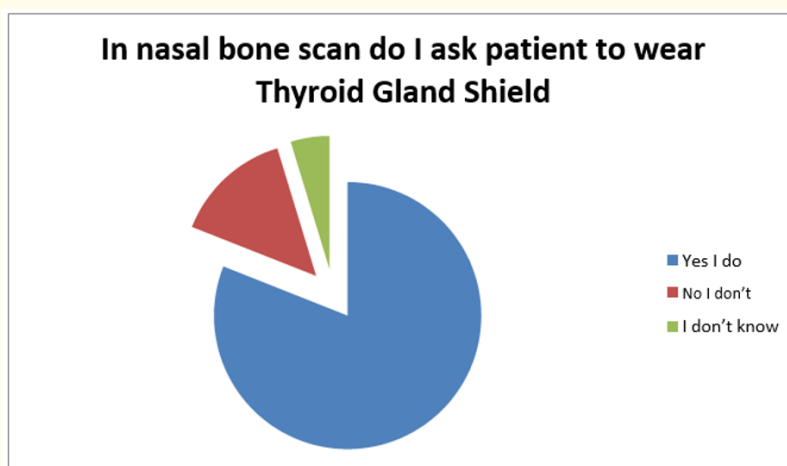


Figure 3

Figure 3 showed the responses of the third question of workers questionnaire that it got 42 responses which indicated that 81% of responses of total answered with Yes, I do that. Whereas 14.3% of responses totally answered with No, there is not necessary.

81% refer to workers who know the necessity of wearing Thyroid Gland Shield in Nasal Bone, but 14.3% refer to workers who do not know the necessity of wearing Thyroid Gland Shield in Nasal Bone. That means the majority of the total have known the necessity of wearing Thyroid Gland Shield in Nasal Bone. The majority of the participants reported wearing safety equipment [4]. As the majority of the respondents (83.7 per cent) were mindful of the workplace health and safety measures [8].

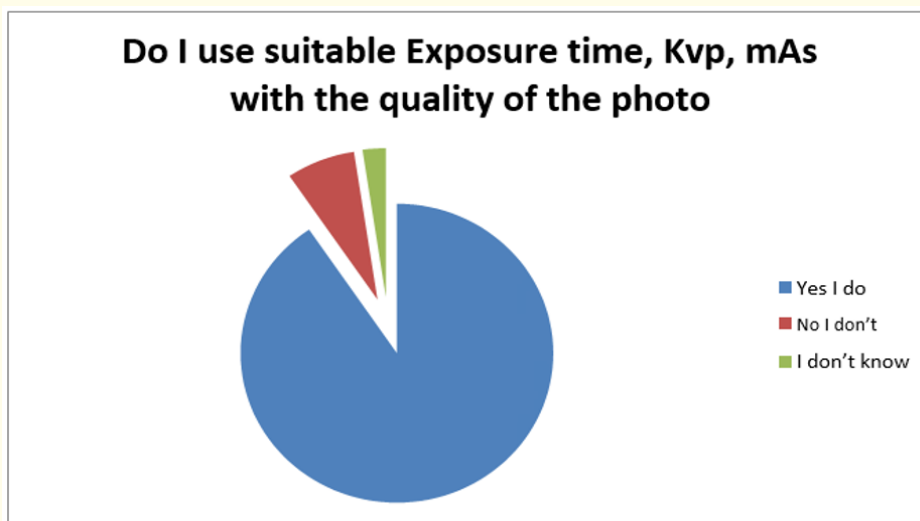


Figure 4

Figure 4 showed the responses of the fourth question of workers questionnaire that it got 42 responses which indicated that 90.5% of responses of total answered with Yes, I do that. Whereas 7.1% of responses totally answered with No, there is not necessary.

90.5% refers to workers who know the necessity of using suitable Exposure time, Kvp, mAs with the quality of the photo, but 7.1% refers to workers who do not know the necessity of using suitable Exposure time, Kvp, mAs with the quality of the photo. That means the majority of the total have known the necessity of using suitable Exposure time, Kvp, mAs with the quality of the photo.

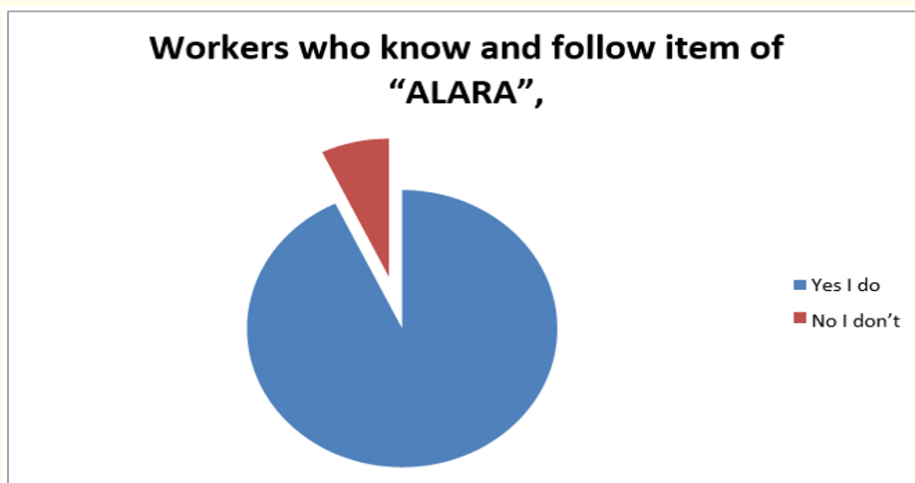


Figure 5

Figure 5 showed the responses of the fifth question of workers questionnaire that it got 42 responses which indicated that 92.9% of responses of total answered with Yes, I do that. Whereas 7.1% of responses totally answered with No, there is not necessary.

92.9% refers to workers who know and follow item of "ALARA", but 7.1% refers to workers who do not know and follow item of "ALARA". That means the majority of the total have known and followed item of "ALARA".

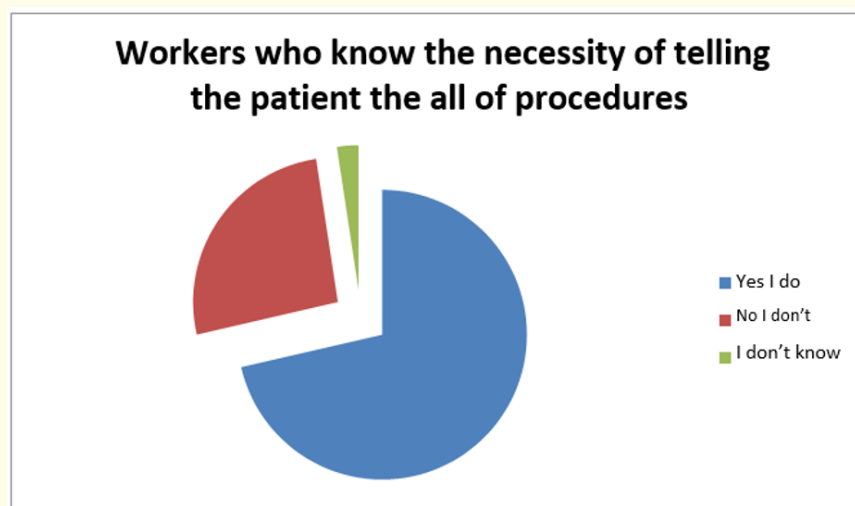


Figure 6

Figure 6 showed the responses of the sixth question of workers questionnaire that it got 42 responses which indicated that 71.4% of responses of total answered with Yes, I do that. Whereas 26.2% of responses totally answered with No, there is not necessary.

71.4% refers to workers who know the necessity of telling the patient the all of procedures, but 26.2% refers to workers who do not know the necessity of telling the patient all procedures. That means the majority of the total have known the necessity of telling the patient the all of procedures.

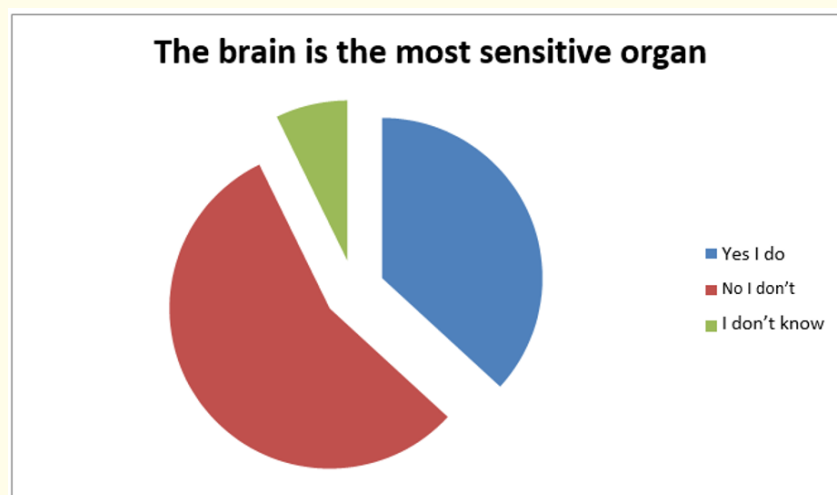


Figure 7

Figure 7 showed the responses of the seventh question of workers questionnaire that it got 42 responses which indicated that 54.8% of responses of totally answered with Yes. Whereas 38.1% of responses of total answered with No. 54.8% refers to workers who know that the brain is the most sensitive organ, but 38.1% refers to workers who do not know that the brain is the most sensitive organ. That means more than half of the total have known that the brain is the most sensitive organ.

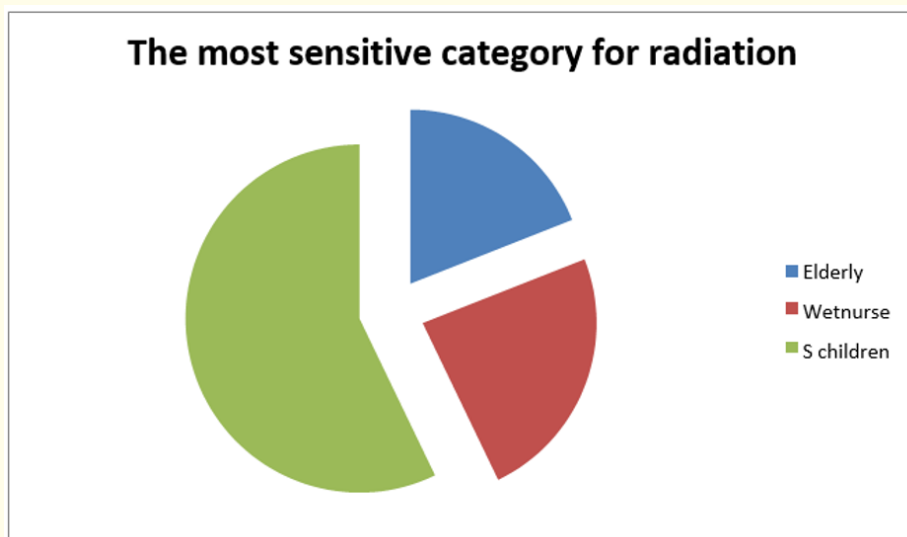


Figure 8

Figure 8 showed the responses of the eighth question of workers questionnaire that it got 42 responses which indicated that 57.1% of responses of total answered with the older. Whereas, 23.8% of responses of total answered with kids.

57.1% refers to workers who choose that the kids are the most sensitive category for radiation, but 23.8% refers to workers who choose wetnurses are the most sensitive category for radiation. That means more than half of the total have known that the kids are the most sensitive category for radiation. scientific evidence, children are in general more sensitive to radiation than adults and therefore require a greater degree of protection [10].

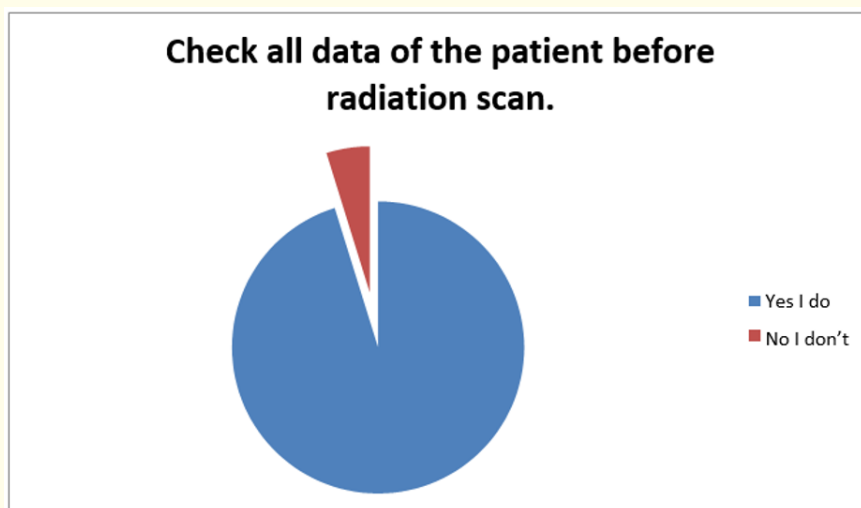


Figure 9

Figure 9 showed the responses of the ninth question of workers questionnaire that it got 42 responses which indicated that 95.2% of responses of total answered with Yes, I do that. Whereas, 4.8% of responses of total answered with No, it is not necessary.

95.2% refers to workers who check all data of the patient before the radiation scan, but 4.8% refers to workers who do not check all data of the patient before the radiation scan. That means the majority of the total have known that necessary to check all data of the patient before radiation scan.

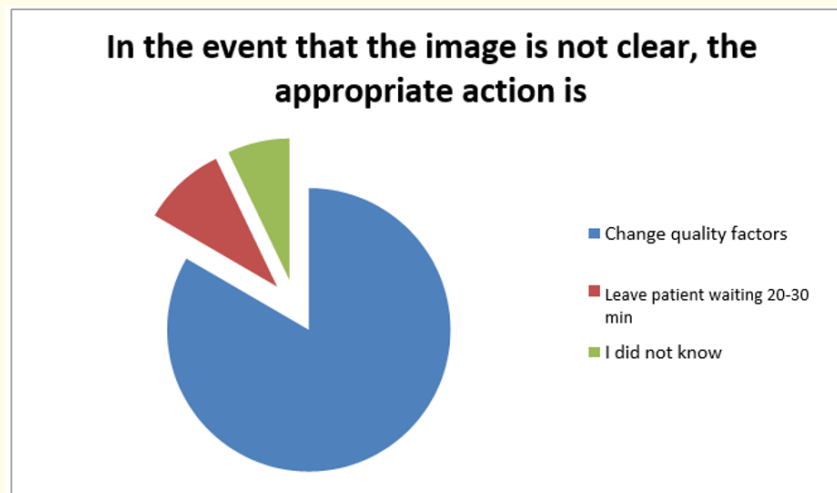


Figure 10

Figure 10 showed the responses of the tenth question of workers questionnaire that it got 42 responses which indicated that 83.3% of responses of total answered with “change quality factors”. Whereas, 9.5% of responses of total answered with leave patient waiting 20-30 min. 7.1% of responses of total answered with they did not know.

95.2% refers to workers who change the quality factor to clear the photo, but 9.5% refers to workers who leave patient waiting 20-30 min. That means the majority of the total have known that the suitable procedure, in that case, is to change the quality factors.

The second questionnaire for patients

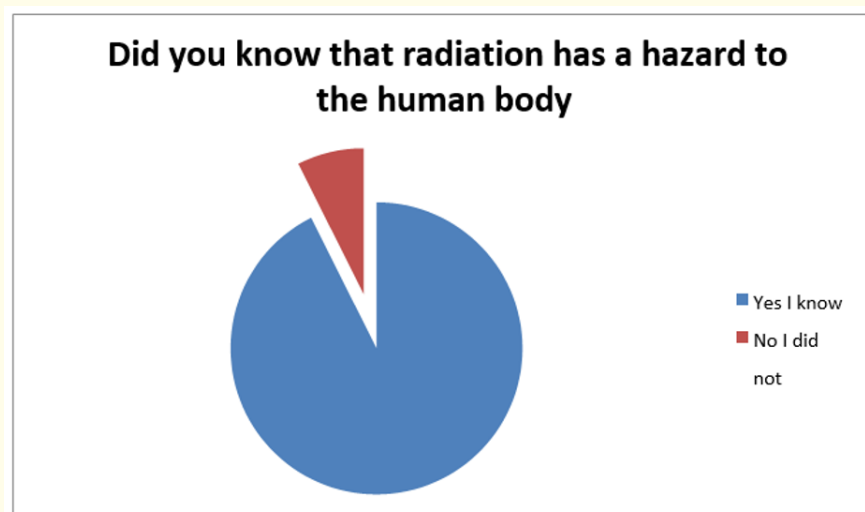


Figure 11

Figure 11 showed the responses of the first question of the patient’s questionnaire that it got 81 responses which indicated that 92.6% of responses of total answered with Yes, I know that. Whereas 7.4% of responses totally answered with No, I do not know.

92.6% refers to patients who know that radiation has a hazard to the human body, but 7.4% refers to patients who do not know that radiation has a hazard on the human body. That means the majority of the total have known that radiation has a hazard to the human body. Biological (infectious) hazards, toxic hazards, physical hazards, environmental hazards, and psychological hazards are all typical hazards in a healthcare setting [6].

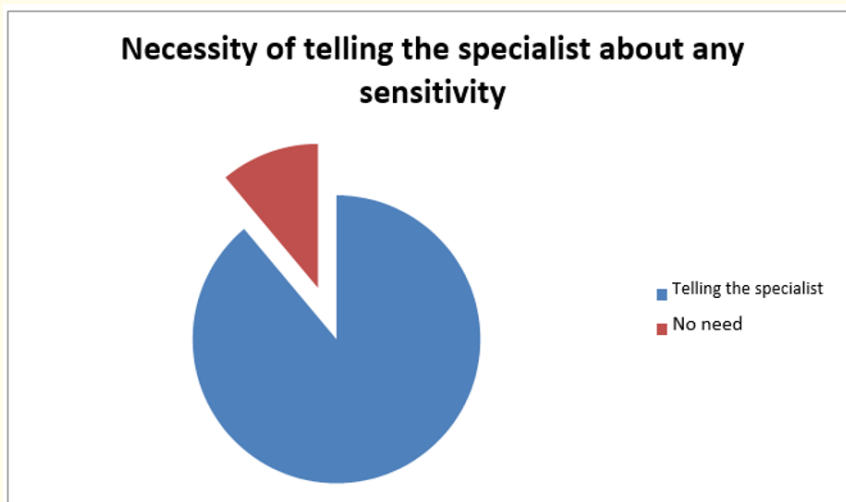


Figure 12

Figure 12 showed the responses of the second question of the patient’s questionnaire that it got 81 responses which indicated that 88.9% of responses of total answered with telling the specialist. Whereas, 11.1% of responses totally answered with there is no need.

88.9% refers to patients who know the necessity of telling the specialist about any sensitivity, but 11.1% refers to patients who do not know the necessity of telling the specialist about any sensitivity. That means the majority of the total have known the necessity of telling the specialist about any sensitivity.

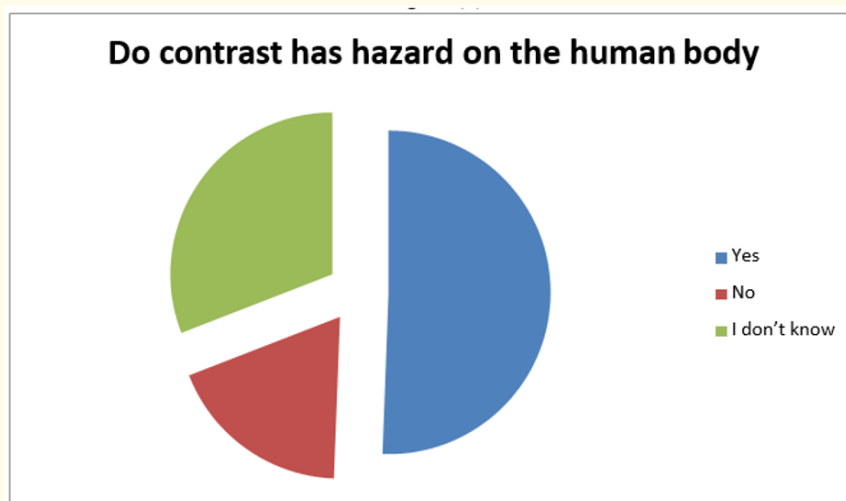


Figure 13

Figure 13 showed the responses of the third question of the patient’s questionnaire that it got 81 responses which indicated that 50.6% of responses of total answered with Yes.

Whereas, 18.5% of responses totally answered with No. 30.9% of responses answered with did not know.

50.6% refers to patients who know that contrast has hazard on the human body, but 30.9%% refers to patients who do not know that contrast has hazard on the human body. That means half of the total have known that contrast has hazard on the human body. A potential cause of harm or adverse health effects on an individual or individuals as a result of the work one does or the atmosphere in which one works is referred to as an occupational hazard [6].

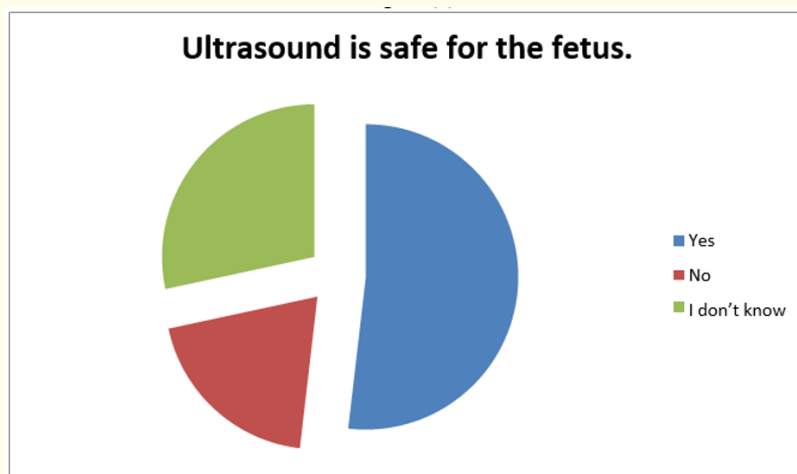


Figure 14

Figure 14 showed the responses of the fourth question of the patient’s questionnaire that it got 81 responses which indicated that 51.9% of responses of total answered with Yes. Whereas, 19.8% of responses of total answered with No.

51.9% refers to patients who know that television radiation is safe for the fetus, but 48.1% refers to patients who do not know that television radiation is safe for the fetus. That means half of the total have known that television radiation is safe for the fetus.



Figure 15

Figure 15 showed the responses of the fifth question of the patient’s questionnaire that it got 81 responses which indicated that 95.1% of responses of total answered with no.

Whereas, 4.6% of responses of total answered with yes.

4.6% refers to patients who know the required procedure when hearing the word “ORANGE”, but 95.1% refers to patients who do not know the required procedure when hearing the word “ORANGE”. That means the majority of the total have known that the required procedure when hearing the word “ORANGE”.

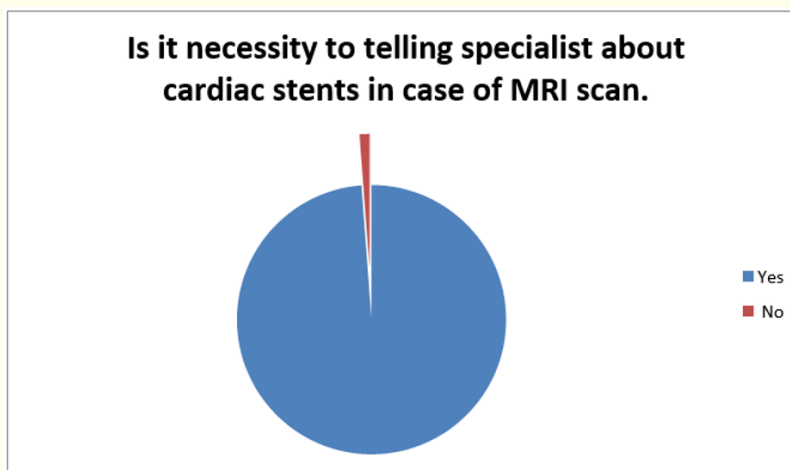


Figure 16

Figure 16 showed the responses of the sixth question of the patient’s questionnaire that it got 81 responses which indicated that 98.8% of responses of total answered with tell specialist. Whereas, 1.2% of responses of totally answered with there is no need.

98.8% refers to patients who know the necessity of telling specialist about cardiac stents in case of MRI scan, but 1.2% refers to patients who do not know the necessity of telling specialist about cardiac stents in case of MRI scan. That means the majority of the total have known that the necessity of telling specialist about cardiac stents in the scan of MRI.

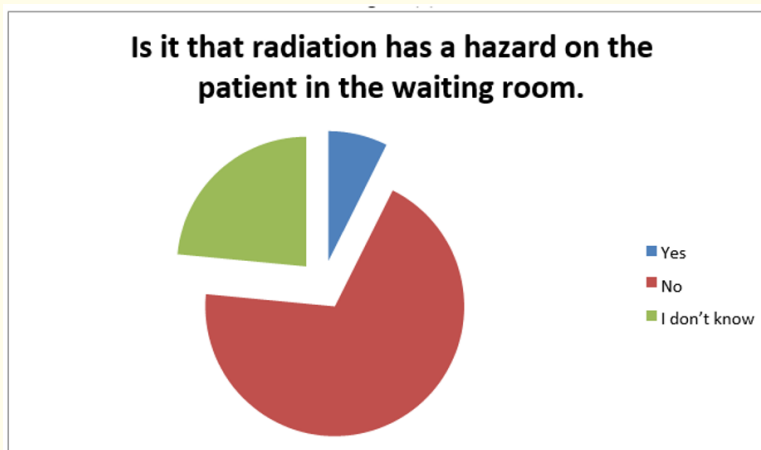


Figure 17

Figure 17 showed the responses of the first question of the patient’s questionnaire that it got 81 responses which indicated that 69.1% of responses of totally answered with No. Whereas, 7.4% of responses of total answered with Yes.

69.1% refers to patients who rejected that radiation has a hazard on the patient in the waiting room, but 23.5% refers to patients who do not know that radiation has a hazard on the human body. That means the majority of the total rejected that radiation has a hazard on the patient in the waiting room.

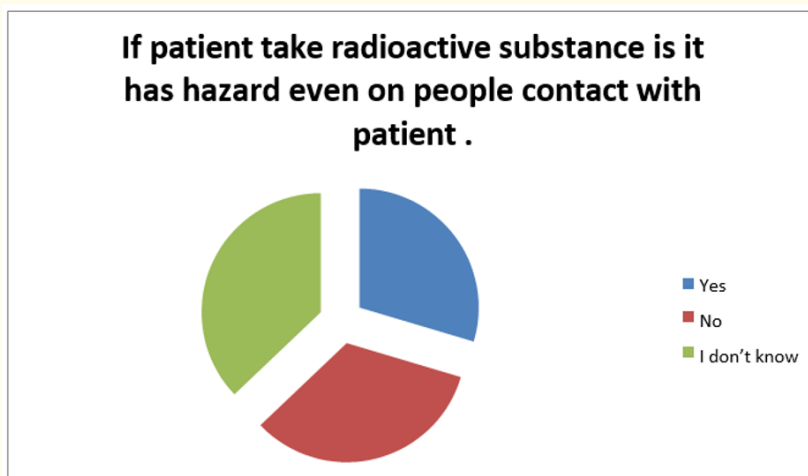


Figure 18

Figure 18 showed the responses of the eighth question of the patient’s questionnaire that it got 81 responses which indicated that 29.6% of responses of total answered with Yes. Whereas 37% of responses totally answered with No, I do not know.

29.6% refers to patients who confirm that radiation has hazard even on people contact with patient exposure to radiation, but 37% refers to who did not know the radiation has hazard even on people contact with patient exposure to radiation. That means the majority of the total have not known that radiation has hazard even on people contact with patient exposure to radiation.

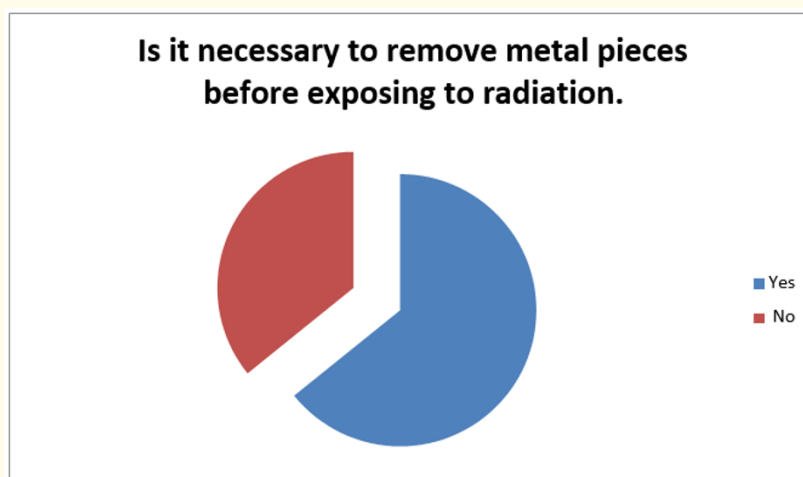


Figure 19

Figure 19 showed the responses of the first question of the patient’s questionnaire that it got 81 responses which indicated that 64.2% of responses of total answered with Yes.

Whereas, 35.8% of responses of total answered with I do not know.

64.2% refers to patients who know that necessary to remove metal pieces before exposure to radiation, but 35.8% refers to patients who do not necessarily remove metal pieces before exposing to radiation. That means more than half of the total have known the necessary to remove metal pieces before exposing to radiation.

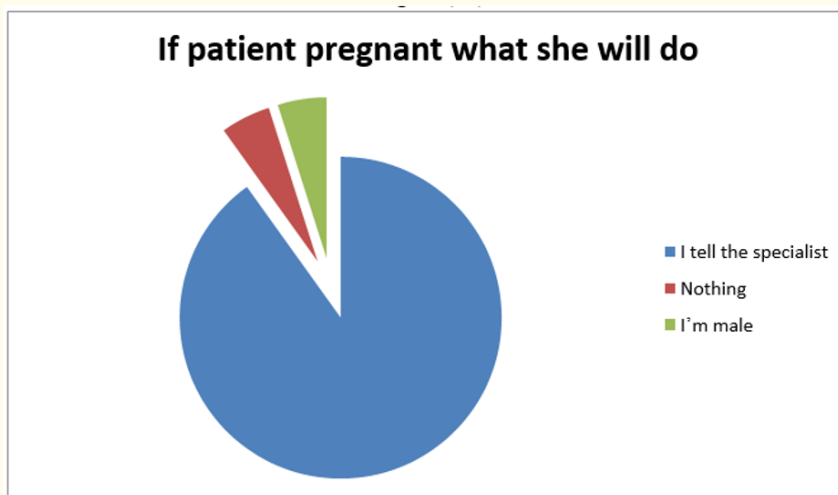


Figure 20

Figure 20 showed the responses of the first question of the patient’s questionnaire that it got 81 responses which indicated that 90.1% of responses of total answered with Yes, I know that. Whereas 8.9% of responses of totally answered with different replies; No, there is no need, do a scan before exposing, or the patient is male.

90.1% refers to patients who know the necessity of telling the specialist the pregnant patient, but 8.9% refers to patients who do not know that the necessity of telling the specialist the pregnant patient. That means the majority of the total have known that the necessity of telling the specialist the pregnant patient.

Conclusion

Most of the patients in the radiology department have knowledge that radiation causes harm to the human body, the workers in the radiation department also have a Knowledge about the necessity of requesting the patient in the radiational room to wear the Lead Apron and it was also found that the workers have knowledge about the necessity to follow safety measures.

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