

Patient Knowledge & Description of Work Safety and Health (K3) in a Radiological Environment

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Work safety is a condition that is free from the risk of damage and accidents. Health is a condition of prosperity starting from the body, soul and moving to social aspects which allows all people to live productively both socially and economically. This work safety and health effort must be carried out to realize optimal work productivity and protection of workers and other people, especially places that are at risk of danger. Therefore, hospitals are included in the criteria for workplaces with various potential hazards that can have health impacts, such as potential radiation hazards. One hospital medical service that requires an important role in occupational health and safety is a radiology installation unit. The risks that may be caused by the use of ionizing radiation can be deterministic, stochastic or genetic effects. Unisma Malang Islamic Hospital (RSI) is one of the hospitals in Malang City that has a radiology installation. Therefore, Unisma Malang Hospital is required to apply Radiation Safety Management. The purpose of this study was to determine the Patient Knowledge Description of Occupational health and safety (K3) in the Radiology Installation of Unisma Hospital, in Malang in 2019. This study is descriptive. Sampling in this study uses total sampling, which is 30 patients who underwent examination at the radiology installation unit at Unisma Hospital, Hospital B and Hospital C. Information is obtained through the distribution of questionnaires and direct observation. The results showed that the patient's knowledge of radiology in general was included in the unfavourable category of 61.1%; radiation protection in a fairly good category of 52.3% and radiation to the body was included in the good category of 57.3%.

Key words: *Knowledge, Radiology, Patients and Unisma Islamic Hospital (RSI) Malang.*



Introduction

Work safety is a condition that is free from the risk of damage and accidents in which we work which and includes the condition of the building, the condition of the engine, the condition of the equipment and also the conditions of the workers (Simanjuntak, 1994). Health is a condition of prosperity starting from the body, soul and extending to social aspects which allows all people to live productively both socially and economically (Law Number 23, 1992). These occupational health and safety efforts must be carried out to realize optimal work productivity and the protection of workers and other people in all workplaces, especially places that are at risk of health hazards and prone to contracting diseases. Therefore, hospitals are included in the criteria for workplaces with various potential hazards that can cause health impacts, such as potential radiation hazards (Ministry of Health, 2010).

The hospital is a health service institution that organizes individual health services in a comprehensive manner, that provides inpatient, outpatient and emergency services. The implementation of occupational health and safety (K3) in hospitals is not only intended for health care providers, implementers and hospital managers but also aimed at hospital visitors including hospital patients, family accompanying patients and other hospital visitors.

One of the hospital medical services that requires strict adherence to occupational health and safety, in an effort to prevent the occurrence of risk, is the radiology installation unit.

The Radiology installation is a medical service unit that utilizes radiation light in an effort to improve the health status of the community. The use of X-rays is used for diagnostic radiology and interventional radiology (BAPETEN Number 8, 2011). These radiological activities must be considered in aspects of safety and health. X-ray itself is a type of ionizing radiation that can provide benefits (diagnosed) with radiation from an organ or disease abnormalities can be detected earlier and more thoroughly (Suyatno, 2011). The use of this radiation beam also has risks or side effects that can be caused.

The risks that may be caused by the use of ionizing radiation can be deterministic, stochastic or genetic effects. The use of radiation that is not in accordance with the standards can also cause radiation accidents. Other hazards that can be caused include damage to body tissue cells which can result in the appearance of cancer, the deterministic effects that can affect reproductive organs or gonads are sterilization or infertility and cause early menopause and genetic effects that can be caused are disability in the offspring. Harm may also be caused in the form of hair loss and skin damage.

Seeing as the potential danger caused by the use of X-rays is quite large, the safety factor is an important thing to note, this aims to minimize the impact of the risk of workplace



accidents in radiology installations as well as the impact on officers and patients who are conducting radiation tests. To prevent this, according to Government Regulation No. 11 of 1975 concerning occupational safety, and specifically for safety and health, the use of ionizing radiation is contained in Government Regulation No. 63 of 2000. Where in the regulation it is explained that every agency that uses ionizing radiation must implement Radiation Safety Management in an effort to prevent and control radiation accidents. These countermeasures are carried out to protect patients, workers and community members from the dangers of radiation.

Safety regarding the use of radiation is also contained in Government Regulation Number 33 of 2007 concerning Safety of Ionizing Radiation and Security of Radioactive Sources, every person or entity that will utilize nuclear power such as energy originating from ionizing radiation sources must have a permit to use nuclear power and meet the requirements of radiation safety. Radiation safety requirements include (1) management requirements; (2) radiation protection requirements; (3) technical requirements; and (4) safety verification that aims to achieve the safety of workers and community members.

Unisma Malang Islamic Hospital (RSI) is one of the hospitals in Malang City that has a radiology installation. As a hospital with radiology service facilities that use ionizing radiation (X-rays) for x-ray activities then based on Government Regulation No. 63 of 2000 RSU Unisma Malang must implement Radiation Safety Management.

The purpose of this study was to determine the Patient Knowledge Description of Occupational health and safety (K3) in Radiological Installation of Unisma Hospital in Malang in 2019 which was viewed from 3 levels of knowledge namely radiology, radiation protection and body contamination.

Literatur Review

According to law No. 44 of 2009 concerning hospitals, what is meant by a hospital is a health service institution that organizes individual health services in a comprehensive manner that provides inpatient, outpatient, and emergency services. Hospitals that implement patient safety principles are obliged to identify and control all important strategic and operational risks. This covers all managerial and functional areas, including service areas, and clinical areas. Hospitals need to ensure the system runs to control and reduce risk.

Risk

Risk is something that leads to uncertainty over the occurrence of an event during a certain time interval in which the event causes a loss. Risk is generally seen as something negative, such as potential for loss, danger, and other consequences. These losses are a form of uncertainty that should be understood and managed effectively by the organization as part of the strategy so that it can be value added and support the achievement of organizational goals.

Sources of Risk Causes According to sources of causes, the risk can be distinguished as follows:

1. Internal Risk, the risk originating from within the company itself.
2. External Risk, the risk originating from outside the company or the environment outside the company.
3. Financial Risk, is a risk caused by economic and financial factors, such as changes in prices, interest rates, and currencies.
4. Operational Risk, is all risks that do not include financial risk. Operational risk is caused by human, natural and technological factors.

Danger Risk in the Hospital

Not all hazards in the hospital will appear if we cannot recognize them, especially the risk of biological hazards, because the presence of micro pathogenic organisms does not appear to be a risk of physical or chemical hazards. However, the impact of the risk of biological hazards in the hospital if not controlled, can have a serious impact on both the health and safety of workers and visitors and the community around the hospital. In general, the risk of harm in hospitals can be grouped into 5 groups as follows:

a. Physical Hazard Risk

There are two physical hazards, namely mechanical hazards and radiation hazards.

a) Mechanical danger.

1. Taper, sharp and hot objects.
2. Movable objects that can hit
3. Risk of being pinched, buried and drowned.
4. Risk of falling from the same height; slipping, tripping, etc.
5. Falling from a different height. This risk is in the child and mental care room..

b) Radiation Hazards.

1. The danger of ionizing radiation is electromagnetic radiation or particles that are capable of producing direct or indirect ions. Examples in hospitals: in radiodiagnostic units, radiotherapy and nuclear medicine.

2. Non-ionizing radiation hazards are electromagnetic radiation with insufficient energy for ionization, eg infrared radiation or microwave radiation. Radiation hazard control is carried out for radiation workers, students, visitors and pregnant patients.
3. The risk of danger due to noise is noise due to work tools or work environment that exceeds a certain threshold. This risk may be in the boiler room, electric generator, and equipment that uses large enough equipment where the noise level is not monitored and controlled.
4. Risk of danger due to lighting is lighting in a work environment that is lacking or excessive. The level of lighting throughout the hospital area has also been monitored and reported such as the noise risk.
5. The risk of electrical hazards is the danger of electrical short circuit and electric shock. Control that has been done is to preventive maintenance of all electrical equipment carried out by IPSRS.
6. The risk of danger due to the work climate is in the form of room temperature and humidity levels.
7. The risk of danger due to vibration is a risk that is not found in many hospitals but may still be present mainly in dentistry that uses a drill with an electric motor and in housekeeping / household that uses a lawn mower (garden section).

b. Biological Hazard Risk

- a) Risk of pathogenic germs from patients (nosocomial). This risk in the hospital has been controlled by the Hospital Infection Monitoring Officer (PIRS) coordinating with the K3 Unit, RS Environmental Sanitation Installation (ISLRS) and the work unit providing services directly to patients.
- b) Risks from animals (rats, cockroaches, flies, cats, etc.). This risk is controlled by ISLRS and must be supported by good housekeeping from all employees and residents of the hospital.

c. Chemical Hazard Risk

Risks of chemicals used in the production process which include:

- a) Disinfectants namely materials used for environmental decontamination and equipment in hospitals such as; mopping the floor, disinfection of equipment and surfaces of equipment and rooms, etc.
- b) Antiseptics which are ingredients used for washing hands and washing the surface of the patient's skin such as alcohol, povidone iodine, and others.
- c) Detergents, namely materials used to wash linen and other equipment.
- d) Reagents, namely substances or materials used to carry out clinical laboratory examinations and anatomical pathology.
- e) Cytotoxic drugs, namely drugs used for the treatment of patients.

f) Medical gases, namely gases used for the treatment and support of patient treatments such as oxygen, carbon dioxide, nitrogen, oxide nitrous oxide, nitrous oxide, etc..

d. Physiological / Ergonomic Hazard Risk

This risk is found in almost all activities in the hospital in the form of activities: lift and transport, sitting position, incompatibility between work equipment and physical size of workers. Control is carried out through regular socialization by the K3 Unit.

e. Psychological Hazard Risk

This risk can also occur in all hospitals in the form of disharmony between people in hospitals, both fellow workers, workers and customers, and workers with leaders.

Research Method

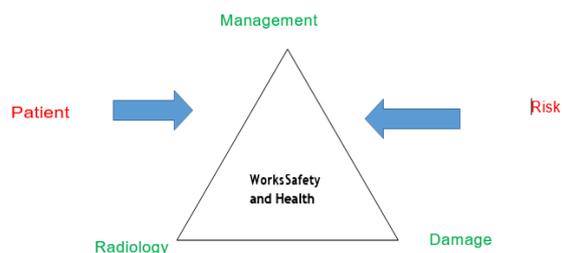
This research is descriptive. It is research carried out by describing the patient's knowledge of occupational health and safety (K3) in the Radiology Installation of Unisma Hospital Malang.

Sampling in this study uses total sampling, which is 30 patients who underwent the examination at the radiology installation unit at Unisma Hospital Malang, Hospital B. and Hospital C.

Information about this patient's knowledge is obtained by distributing questionnaires and making observations directly. There are 3 important levels of knowledge that need to be reviewed, namely knowledge about radiology itself, protection equipment used and contamination caused by radiation beams on the body.

Other Recommendations

The following are the results of the research conducted.



Characteristics of Patients in Radiology Installation of UNISMA Hospital, Hospital B, and Hospital C.

From the collected data, the characteristics of Patients in Radiology Installation Unisma Hospital Malang, Hospital B, Hospital C. consists of gender, and education:

1. Gender.

Table 4.1: Gender

No	Gender	Frequency		Percentage	
		Men	female	Man	female
1	Unisma Hospital	14	16	46,7%	53,3%
2	Hospital B	12	18	40%	60%
3	Hospital C	17	13	56%	44%

Based on Table 4.1, it can be seen that the sex of patients in the Radiology Installation of Unisma Malang are as follows. The most number of patients who are female as many as 16 people (53.3%) and the least are men as many as 14 people (46.7%), Hospital B patients who are female, 18 people (60%) and the least are men, 12 people (40%), and hospital C patients who are female, 13 people (44%) and the rest are men, 17 people (56%).

2. Education.

Table 4.2: Education

No	Education	Frequency	Percentage
1	Primary school	6	10%
2	Junior high school	16	26%
3	Senior High School	20	33%
4	Diploma	6	10%
5	Bachelor	12	21%

Based on table 4.2, it can be seen that the level of education of patients in Radiology Installation Unisma Hospital, Hospital B and Hospital C is as follows. Most are patients with an undergraduate education (12 people (21%)) and the least are patients with Diploma as (6 person (10%)).

Results and Discussion

Based on the results of the research conducted at the Radiology Installation of Unisma Hospital, Hospital B and Hospital C the following data was obtained:

1. Knowledge about Radiology.

Table 4.3: Knowledge about Radiology

No	Frequency Knowledge about Radiology		Percentage	
	Yes	No	Yes	No
Unisma Hospital	14	16	46,7%	53,3%
Hospital B	12	18	40%	60%
Hospital C	9	11	30%	70%
		Total	38,9%	61,1%

From the results of the study, obtained from 60 respondents, it can be seen that the patient's knowledge of radiology at unisma hospital, hospital B and Hospital C in general is included in the poor category as evidenced by the results of the study which amounted to 61.1% who did not know about radiology, while those who knew numbered only 38.9%.

A lack of knowledge can be caused by several things, including: lack of information, lack of memory / memorization, misinterpreting information, cognitive limitations, lack of interest in learning and not familiar with the source of information (Nanda, 2005).

2. Knowledge of Radiation Protection Equipment

Table 4.4: Knowledge of Radiation Protection Equipment

No	Frequency Knowledge of Radiation Protection		Percentage	
	Yes	No	Yes	No
Unisma Hospital	17	13	56,7%	43,3%
Hospital B	14	16	46,7%	53,4%
Hospital C	16	14	53,4%	46,7%
		Total	52,3	47,7

From the results of the study, it can be seen that the patient's knowledge of radiation protection equipment is included in the fairly good category, which is equal to 52.3% who know the importance of radiation protection devices, while those who do not know is equal to 47.7%.

From the observations made, basically the patients already knew the importance of using protective devices when the radiation process was carried out, but the conditions that occurred in the Radiology Installation of Unisma Hospital in Malang were only used by officers, nurses / doctors on duty. So that the patient's perception that the protection device is only required to be carried out by hospital staff who are conducting the examination.

Further, 17 patients who knew the importance of radiation protection equipment also did not understand what type of protection should be used when around radiation, so that patients did not understand whether the protection equipment used was in accordance with the standards set or not.

3. Knowledge of radiation to the body

Table 4.5: Knowledge of radiation to the body

No	Frequency Knowledge of Radiation to body		Percentace	
	Yes	No	Yes	No
Unisma Hospital	18	12	60%	40%
Hospital B	17	13	56,7%	43,3%
Hospital C	16	14	53,4%	46,7%
		Total	56,7%	43,3%

From the results of the study it can be seen that the patient's knowledge of radiation beam contamination of the body is included in the good category, that is equal to 56.7% knowing about radiation contamination of the body, while the remaining 43.3% do not know.

This is certainly good. Patients with good knowledge of radiation beam contamination of the body will greatly facilitate officers who are negligent in carrying out radiation procedures. In addition, the patient him/herself can also protect him/herself from being exposed to radiation with an intensity that is too high. Not only that, the knowledge possessed by the patient is able to limit him/herself to other people in making open contacts directly with other people, especially after undergoing the radiation process. According to Peter Caracappa, direct contamination can occur through clothing and also skin exposed to radiation rays, but after their clothing and skin that are exposed to radiation are washed and sterilized, they no longer pose a threat to others around them.



Conclusions and Suggestions

Based on the results of this research on the description of patient knowledge about occupational health and safety (K3) in Radiology Installation 3 Hospital, namely Unisma hospital, hospital B, and hospital C, it can be concluded that the patient's knowledge of radiology, radiation protection and radiation to the body in Installation of Radiology 3 Hospital in Malang in 2019 is quite good, only a small proportion of patients need to be given an understanding of radiology, radiation protection, and the dangers of contamination that can affect the body. Therefore, we recommend that the hospital provide an understanding or knowledge of occupational health safety that is applied in the radiology unit



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