

Knowledge Description of Dental Clinic Student in RSGM Unsyiah about Ionizing Radiation and Negative Effect of Ionizing Radiation in Dental Radiography

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ABSTRACT Radiology in medicine always involves ionizing radiation. Ionizing radiation in dentistry is used to diagnose, treatment planning, treatment, or lesion development monitoring. Dental radiography procedures must be carefully managed because X-rays radiation can damage healthy cells and tissues. The degree of radiation injury is related to the total radiation dose, the proportion of body irradiated, the volume of tissues irradiated, and the time interval of the radiation dose received. This study was aimed to know about the knowledge description of dental clinic students in RSGM Unsyiah about ionizing radiation and the negative effect of ionizing radiation in dental radiography. The method of this study is a cross-sectional survey. The study included 254 dental clinic students at RSGM Unsyiah who fulfill inclusion criteria. Subjects were asked to fill questioner about ionizing radiation and the negative effect of radiation in dental radiography. The result of that study shows that knowledge of dental clinic students about ionizing radiation (27,1%) dental clinic students had deficient knowledge, (46,4%) dental clinic students had sufficient knowledge, (26,3%) dental clinic students had a good understanding and knowledge of dental clinic student about negative effect ionizing radiation in dental radiography (15,7%) dental clinic student had deficient knowledge, (62,2%) dental clinic student had sufficient knowledge, (22%) dental clinic student had good knowledge. The conclusion of this study showed that knowledge of dental clinic students about ionizing radiation and the negative effect of ionizing radiation in dental radiography is sufficient.

KEYWORDS: ionizing radiation, negative effect ionizing radiation, dental radiography

INTRODUCTION

Existing research mentions that knowledge about ionizing radiation is quite minimal among medical students, including dentists who propose a radiographic procedure.¹ It is known, knowledge is the result of knowing particular objects through the five senses of human senses, namely the senses of sight, hearing, smell, taste, and touch. Another reference states that knowledge is information that changes something or someone either with a reason for action or by making someone or institutions to be able to act more effectively.

As is well known, dentists use radiographs more often than other health professionals others.² The application of dental radiographic procedures must be extra careful because: X-rays are known to damage healthy cells and tissues.^{3,4} Radiation becomes dangerous when there is negligence or professional ignorance.⁵ Furthermore, the

radiation used within the radiology department has a harmful negative effect on the system biologic, can cause some types of irreversible injury.⁶

Ionizing radiation is radiation that will appear electrically charged particles called ions when hit or hit something. The occurrence of this ion is called ionization. Ionization is essential because, through this process, the body will experience abnormalities or damage to body cells.

Based on the problems above, this study aims to analyze an overview of the knowledge of young dentists at RSGM Unsyiah Banda Aceh regarding ionizing radiation and the negative effects of ionizing radiation in dental radiography. The result is expected to be the additional reference and as input to the management of the RSGM

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Hospital regards ionizing radiation and the negative effects of ionizing radiation in dental radiography

MATERIALS AND METHODS

This descriptive research was conducted by distributing questionnaires on ionizing radiation and the negative effects of radiation ionization in dental radiography to young dentists at RSGM Unsyiah Banda Aceh, who is

willing to participate and meet the research inclusion criteria.

RESULTS

The results are obtained in Table.1. shows a picture of the knowledge of young dentists at RSGM Unsyiah Banda Aceh regarding ionizing radiation. There was 60 dental clinic student who had less knowledge about ionizing radiation (27.2%). 118 dental clinic students had sufficient

knowledge about ionizing radiation (46.4%). Meanwhile, 67 dental clinic students had good knowledge of ionizing radiation (26.4%). The results of this research are shown in **Table 1**.

Table 1. Knowledge of Young Dentists About Ionizing Radiation

Category	Number of Subject	Percentage (%)
Deficient	69	27,2
Sufficient	118	46,4
Good	67	26,4
TOTAL	254	100

.The results are obtained in Table. 2. shows a picture of the knowledge of young dentists at RSGM Unsyiah Banda Aceh regarding the negative effects of ionizing radiation in dental radiography. Forty dental clinic students have less knowledge about the negative effects of radiation in dental radiography (15.7%). There were 158 young dentists

Who had sufficient knowledge about the negative effects of radiation in dental radiography (62.2%). Meanwhile, young dentists know about the negative effects of radiation in dental radiographs as many as 56 people (22.1%).

Table.2. Knowledge of young dentists regarding the negative effects of ionizing radiation in Dental Radiography

Category	Number of Subject	Percentage (%)
Deficient	40	15,7
Sufficient	158	62,2
Good	56	22,1
TOTAL	254	100

DISCUSSION

Radiographic examination always involves ionizing radiation. The use of ionizing radiation in dentistry, as well as in general medicine, is increasing rapidly. Radiographic examination is the basic guideline in dentistry, especially during patient care and follow-up care. Research conducted on young dentists regarding knowledge of ionizing radiation was sufficient, as shown in Table 1. This result is influenced by young dentists who have received dental radiology courses during the lecture. This result is slightly better than research by Yucel A¹ that states that knowledge about ionizing radiation is still lacking among medical students and doctors who request treatment for radiographic procedures. This result is influenced by the insufficient knowledge of medical students regarding ionizing radiation during the lecture period.

The procedure for using dental radiographs must be carried out with caution because X-rays, which are a source of ionizing radiation, can damage healthy cells and tissues. The energy emitted by X-rays is known to be waves or particles, which can be transferred through objects called radiation. As it passes through an object, radiation can remove an electron orbital from the atom it interacts with, causing the formation of negative ions and positive ions. These ions will then generate an effect or influence on materials, including living things. Based on the presence or absence of ionization, radiation can be divided into two categories, namely, ionizing radiation and non-ionizing radiation. Ionizing radiation is radiation that will appear electrically charged particles called ions when it hits or hits something. The occurrence of this ion

is called ionization. Ionization is essential because, through this process, the body will experience abnormalities or damage to body cells. Examples of ionizing radiation are X-rays, alpha particles (α), particles beta (β), gamma rays (γ), and neutron particles. Non-ionizing radiation is radiation that cannot cause ionization. Examples of non-ionizing radiation are radio waves, microwaves, infrared, visible, and ultraviolet light.^{7,8}

Results research on the description of the knowledge of young dentists about the adverse effects of Ionizing radiation in dental radiographs is sufficient, shown in Table.2. Many studies show an understanding of the harmful effects of ionizing radiation on the body was ignored by the doctor who requested a radiographic procedure to identify the disease encountered. There is no risk-free X-ray exposure. Therefore the use of radiation by dentists must be accompanied by a responsibility to ensure proper protection.¹ Assumption of young dentist researchers perceive radiation dose in dental radiography is relatively very small, and the effects on the body cannot be seen directly, so there are several young dentists at the time of taking photos X-rays do not protect themselves by wearing an apron, because the apron available is no longer suitable for use.

The absorbed dose is a measurement of the quantity of each type of ionizing radiation received by the mass of every kind of material. This is the amount of radiation absorbed by the patient's tissue.^{9,10} Meanwhile, the radiation dose is critical to know so that it is realized that everyone can be exposed to natural radiation every day. The annual amount of radiation is about 2.7 mSv. Ionizing radiation received from the dental bitewing technique (0.001-0.008 mSv) shows that the radiation dose received from dental X-rays is relatively tiny compared to natural radiation sources.¹⁰

The value varies depending on where people live and how they spend their time. This amount is about 360 millirem. About 20 percent comes from manufactured sources such as medical and dental diagnostic and therapeutic procedures, various consumer products, and occupational exposures. About 80 percent of radiation comes from natural sources, including cosmic radiation, UV rays, and natural radioisotopes. radon gas.¹¹

Radon is a natural radiation source that has received the most attention due to its detrimental effects. These adverse effects are related to human health. Radon is a colorless, odorless, tasteless, and chemically unreactive radioactive gas. This substance is formed from derivatives of radium-226, which is included in the decay chain of uranium-238 present in rock, soil, and water. Fredrich Ernst Dorn discovered radon (Rn) in 1898. These substances can migrate from rocks and ground into the atmosphere. Exposure to radon and its derivatives induces mutations, chromosomal damage, and cancer.¹²

Based on the description above, the knowledge of young dentists at RSGM Unsyiah Banda Aceh regarding ionizing

radiation and the negative effects of ionizing radiation in dental radiography is in a good category. This result is influenced because the dentist's young people have received this lesson during their studies. Still, some dental clinic students don't know because they don't understand the dental radiology knowledge that has been given during the lecture. Some young dentists do not understand the procedure of use dental radiography examination, and several young dentists also performed photo errors. Hence, you have to repeat the photo more than three times at the same time the same to obtain good image quality. Excellent picture quality, whether influenced by density, contrast, detail, or good sharpness, so that radiographic images can be interpreted well. They can provide clear information about the object or organ being examined. As a result, the subject's teeth receive low doses of ionizing radiation. Radiation will accumulate and negatively affect the body over a long period.

According to the researcher's assumption, the knowledge of young dentists, in this case, is possible also influenced by the minimum learning time about dental radiography during lectures, lack of interest in seeking knowledge about radiology dentistry as well as perhaps not so much experience in terms of doing x-rays, because the subjects in this study also involve doctors young teeth who have just entered the clinical clerkship. Also affected by information obtained is still lacking. There may be an assumption that the examination radiology in their examination and treatment in small numbers, although. The radiological examination is critical, especially when determining treatment and follow-up examinations.

As a new hospital, the existing facilities are still very minimal, such as the absence of an apron used for self-protection from exposure ionizing radiation, the film badge used to measure the total amount of radiation exposure received by the radiographer or patient, adequate thyroid protection used to protect radiation exposure to the neck area or thyroid gland, dosimetry is a tool used to measure radiation dose, and where special waste disposal for radiographic waste management.

Knowledge is a guide that will shape the behavior of a person.¹³ According to Drucker in Notoatmodjo¹⁴, knowledge is information that changes something or someone either by reasoning for action or by making a person or institution act more effectively. Research Nonaka¹⁵, knowledge is a justified belief to increase a capacity for effective action. Research McKinsey et al. in Notoatmodjo¹⁶, knowledge is an understanding of the causal relationship, which is very important for effective action.

The training activity is needed for young dentist radiographers regarding ionizing radiation and the negative effects to minimize the radiation risk caused by radiographic examination. Radiology practitioners who manage ionizing radiation must be well acquainted with the amount of radiation exposure found in medicine and dentistry—information on ionizing radiation and its effects.

This negative ionizing radiation can be used as a reference to explain to patients the advantages and disadvantages of using X-rays because the radiation is used for any purpose, and no matter how small, it must contain potential hazards to humans. Radiation safety is carried out to create conditions for the dose of ionizing radiation that hits humans and the environment that does not exceed the specified limit value. Education is the most critical factor in preventing examination radiographs that are not needed, among physicians and among patients. Good awareness of patients and doctors regarding ionizing radiation and its dangers the effects of radiation will protect them from an increased lifetime risk of cancer. Ammeruunisa's research¹⁷ shows the radiation dose needed for Dentistry does not pose a considerable risk, but small quantities to remain at risk.

CONCLUSION

Based on the results of data analysis and discussion presented in the chapter previously, the following conclusions can be drawn: An overview of the knowledge of young dentists at RSGM Unsyiah Banda Aceh regarding ionizing radiation is sufficient. 46.4% of young dentists have sufficient knowledge of ionizing radiation.

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