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Relationship Between Respondent Characteristics and The Level of Knowledge of Outpatient Patients' Family About Radiation Signs in The Radiology Installation of Pasaman Barat Regional Hospital

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Abstract
Signs that have been installed in the Radiology Installation of West Pasaman Hospital are indicator lights, red triangle radiation hazard signs, and radiation hazard signs for pregnant women. This study aims to determine the relationship between the characteristics of respondents, namely age, gender and education with the level of knowledge of families of outpatients. The type of research used in this study is quantitative. This research was conducted at the radiology installation of West Pasaman Hospital. The population of this study were families of outpatients at the radiology installation of West Pasaman Hospital. The sample in this study amounted to 82 people with purposive sampling technique. Data collection used a questionnaire, and the data obtained was then processed using the SPSS application. The results showed that in this study there were three characteristics of respondents, namely age with p value <0.05, which means Ho is rejected and Ha is accepted, so there is a significant relationship, gender with p value <0.05, and gender with p value <0.05.

Keywords: *Knowledge of Radiation Signs; Relationships; family outpatients in the radiology installation of West Pasaman Hospital.*

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1. Introduction

Clinical Radiology Services are medical services that utilize all modalities of ionizing and non-ionizing radiation sources for imaging-guided diagnosis and/or therapy. Ionizing radiation is electromagnetic waves and charged particles that, due to their energy, can ionize the medium they pass through. Clinical Radiology Services aim to ensure the safety, security, and health of healthcare workers, patients, the public, and the environment.

Clinical Radiology Services are provided to meet the standards of Clinical Radiology Services in Healthcare Facilities and improve the quality of Clinical Radiology Services in Healthcare Facilities. Diagnostic Clinical Radiology Services are intended for examination and expert opinion to establish a diagnosis. Therapeutic Clinical Radiology Services are intended to guide and provide therapeutic interventions (Regulation of the Minister of Health of the Republic of Indonesia No. 24 of 2020).

In the radiation safety management system in radiology installations, installation businesses must implement a radiation safety management system that includes radiation protection organizations, radiation dose and radioactivity monitoring, radiation protection equipment, health checks, document storage, quality assurance and education and training according to PP No. 63 of 2000. According to (BAPETEN) number 8 of 2020 Ionizing Radiation Safety in the Medical Field hereinafter referred to as Radiation Safety is an action taken to protect patients, workers, community members, and the environment from the dangers of radiation. Radiation Protection is an action taken to reduce the damaging effects of radiation due to radiation exposure. Safety Culture is a combination of organizational and

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individual attitudes within an organization that give top attention and priority to Radiation Safety issues.

West Pasaman Regional Hospital is a Type C hospital. This hospital is the only regional general hospital in West Pasaman Regency, thus allowing for a high frequency of patient visits to the Radiology Installation, which will also increase family visits. Patient data from July to September 2023 shows 450 outpatient visits, with an average of 5 patients per day.

Based on the results of the author's initial interview, namely by giving a simple questionnaire to 5 patients' families, 4 out of 5 patients' families at West Pasaman Regional Hospital did not know and did not understand the meaning of the radiation signs that had been installed in the Radiology Installation of West Pasaman Regional Hospital. The signs that had been installed in the Radiology Installation of West Pasaman Regional Hospital were indicator lights, red triangle radiation hazard signs, and radiation hazard signs for pregnant women. These three signs had been installed for a long time, but there were still many patients and patients' families who did not know and understand the warning signs of radiation hazards.

With the installation of radiation hazard warning signs in the radiology installation of West Pasaman Regional Hospital, is there a relationship between respondent characteristics and the level of knowledge of outpatient families at the Radiology Installation of West Pasaman Regional Hospital?.

2. Method

This research is a quantitative analytical method with a cross-sectional design, namely a study to study the relationship between independent variables with a single measurement at the same time (Notoatmodjo, 2005). This study will examine the relationship between respondent characteristics and the level of knowledge of outpatient families regarding radiation signs in the Radiology Unit of West Pasaman Regional Hospital. The study was conducted at the Radiology Unit of West Pasaman Regional Hospital from July 2023 to June 2024.

Research instruments are the tools used to collect data. These can include questionnaires, observation forms, other forms related to data recording, and so on. The independent variable in this study is the characteristics of the respondents or patient's families. The dependent variable is the level of knowledge of outpatient families. After the data is collected, it is classified into several groups according to the existing variations, then entered into a frequency distribution table, and then described using a predetermined scale.

3. Results and Discussion

The characteristics of respondents in this study include age, gender and education with a total of 82 respondents.

A. Univariate Analysis

1. Age characteristics with level of knowledge of radiation signs.

Table 1. Level of knowledge based on age

		CATEGORIC KNOWLEDGE					
		Not enough		TALL		TOTAL	
		N	%	N	%	N	%
AGE CATEGORICS	TEENAGER	3	9.4	10	20	13	15.8
	MATURE	16	50	33	66	49	59.7
	ELDERLY	13	40.6	7	14	20	24.5
Total		32	100	50	100	82	100

Based on the table1, it is known that the level of knowledge of radiation signs by age with the adolescent category having less knowledge of 3 people, and height of 10 people with a total of 13 people, then with the adult category having less knowledge of 16 people and height of 33 people with a total of 49 people, and in the elderly category having less knowledge of 13 people and height of 7 people with a total of 20 people. The highest level of knowledge of radiation signs in the families of outpatients was found in the adult category, namely 49 people.

2. Gender characteristicswith the level of knowledge of radiation signs

Table 2. Level of knowledge based on gender

		CATEGORIC KNOWLEDGE					
		NOT ENOUGH		TALL		TOTAL	
		N	%	N	%	N	%
JK	man	9	28.5	20	40	29	35.5
	Woman	23	71.5	30	60	53	64.5
Total		32	100	50	100	82	100

Based on table 2, it is known that the level of knowledge about radiation signs based on gender categories has the following results: in the male category, 9 people have less knowledge and 20 people have high knowledge with a total of 29 people, then in the female category, 23 people have less knowledge and 30 people have high knowledge with a total of 53 people. The level of knowledge about radiation signs in the female gender category is higher with a total of 53 people compared to the male category, namely with a total of 29 people.

3. Characteristics of education with the level of knowledge of radiation signs.

Table 3. Level of knowledge based on education

		CATEGORIC KNOWLEDGE					
		NOT ENOUGH		TALL		TOTAL	
		N	%	N	%	N	%
PDD	Elementary School	14	43.7	4	8	18	22
	JUNIOR HIGH SCHOOL	10	31.2	9	18	19	23.5
	SENIOR HIGH SCHOOL	7	21.8	14	28	21	25.6
	BACHELOR	1	3.1	23	46	24	29.1
Total		32	100	50	100	82	100

Based on the table3, the level of knowledge about radiation signs based on education with the elementary school category having a knowledge level of 14 people and a high level of 4 people with a total of 18 people, in the junior high school category having a knowledge level of 10 people and a high level of 9 people with a total of 19 people, then in the high school category having a knowledge level of 7 people and a high level of 14 people with a total of 21 people, and in the bachelor's category having a knowledge level of 1 person and a high level of 23 people with a total of 24 people. the level of knowledge

about radiation signs based on education with the bachelor's category having the highest total level of knowledge with a total of 24 people compared to high school, middle school, and elementary school.

B. Bivariate Analysis

1. The relationship between the level of knowledge of radiation signs and age

Table 4 chi-square tests of age

		CATEGORIC KNOWLEDGE						Person chi-square
		Not enough		TALL		TOTAL		
		N	%	N	%	N	%	
AGE	TEENAGER	3	9.4	10	20	13	15.8	0.019
	MATURE	16	50	33	66	49	59.7	
	ELDERLY	13	40.6	7	14	20	24.5	

The results of the statistical test using the chi-square test with a value of*p* =0.019 (p-value <0.05) so that Ho is rejected and Ha is accepted, it is concluded that there is a significant relationship between knowledge of radiation signs and age. The reason for choosing the Pearson chi-square decision making is that this variable test uses a 3x2 table so that the selection of the asymptotic significant value in the Pearson chi-square section is 0.019

2. The relationship between the level of knowledge about radiation signs and gender

Table 5. Chi-square tests of gender

		CATEGORIC KNOWLEDGE						*Pearson chi-square*
		NOT ENOUGH		TALL		TOTAL		
		N	%	N	%	N	%	
JK	man	9	28.5	20	40	29	35.5	0.237
	Woman	23	71.5	30	60	53	64.5	

The results of the statistical test using the chi-square test with a value of*p* =0.237 (p value > 0.05) so that Ho is accepted and Ha is rejected, it is concluded that there is no significant relationship between knowledge of radiation signs and gender. The reason for choosing the Pearson chi-square decision making is that this variable test uses a 2x2 table so that the selection of the asymptotic significant value in the Pearson chi-square section is 0.237

3. The relationship between the level of knowledge about radiation signs and education

Table 4.10 chi-square tests of education

	CATEGORIC KNOWLEDGE			
	NOT ENOUGH	TALL	TOTAL	*Pearson chi-square*

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		N	%	N	%	N	%	
PDD	Elementary School	14	43.7	4	8	18	22	0.000
	JUNIOR HIGH SCHOOL	10	31.2	9	18	19	23.5	
	SENIOR HIGH SCHOOL	7	21.8	14	28	21	25.6	
	BACHELOR	1	3.1	23	46	24	29.1	

The results of the statistical test using the chi-square test with a value of*p* =0.000 (p-value <0.05) so that Ho is rejected and Ha is accepted, it is concluded that there is a significant relationship between knowledge of radiation signs and education. The reason for choosing the Pearson chi-square decision making is that this variable test uses a 4x2 table so that the selection of the asymptotic significant value in the Pearson chi-square section is 0.000.

DISCUSSION

1. Level of Knowledge based on Age

Based on table 4, it is known that the level of knowledge of radiation signs by age with the adolescent category having less knowledge of 3 people, and height of 10 people with a total of 13 people, then with the adult category having less knowledge of 16 people and height of 33 people with a total of 49 people, and in the elderly category having less knowledge of 13 people and height of 7 people with a total of 20 people. The highest level of knowledge about radiation signs in the families of outpatients was found in the adult category, namely 49 people.

This is because in adulthood a person has a better level of knowledge as time goes by the level of development and technology is increasingly advanced and science will also change and increase so that the level of knowledge of adults is also different compared to the elderly because in the elderly the ability to remember something also decreases. This is supported by the theory of Azwar (2003), that as a person's age increases it can affect the increase in knowledge he or she acquires, but at certain ages or approaching old age the ability to accept or remember something will decrease. The older a person is, the more mature a person's level of maturity and knowledge will be in thinking and working (Hucklok, 1998). This research is in line with the research of Lilik Hanifah (2019) which states that a person's age also affects a person's ability to grasp and think patterns. The older they are, the more their ability to grasp and think patterns develop, so the knowledge they acquire is better.

The statistical results with the chi-square test with a p value = 0.019 (p value < 0.05) so that Ho is rejected and Ha is accepted, it can be concluded that there is a significant relationship between knowledge and age.

According to the theory of Corneles & Lesu (2015), age can influence a person's knowledge, where the older a person is, the more their knowledge will increase according to the information they obtain.

This research is in line with research conducted by Murman (2015). The significant relationship between knowledge and age occurs because the respondents' ages tend to be the same and their ages are in productive conditions where cognitive function is still good. This research is in line with research by Rozy Dian Putri (2022) which states that age is one of the factors that influences the level of knowledge, because it influences physical, psychological, and social maturity which can influence the learning process.

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Based on the results of this study, it can be concluded that, in the elderly category, the lowest level of knowledge in the questionnaire that has been filled out by the family of the outpatient is in question number 3 with the question "What is the meaning of the picture below?" with a total of 11 wrong answers, then in question number 5 with the question "What is the meaning of the sign of the picture of a person running below?" with a total of 10 wrong answers and in question number 7 with the question "What is the meaning of the red color in the picture below?" with a total of 10 wrong answers. level of knowledge based on age in the Radiology Installation of West Pasaman Regional Hospital, as a person's age increases, a person's level of knowledge will increase at a certain age, in adulthood the level of knowledge is higher but in the elderly it is lower because approaching old age the acceptance or memory of something will decrease.

2. Level of Knowledge based on gender

Based on table 5, it is known that the level of knowledge about radiation signs based on gender categories has the following results: in the male category, 9 people have less knowledge and 20 people have high knowledge with a total of 29 people, then in the female category, 23 people have less knowledge and 30 people have high knowledge with a total of 53 people. The level of knowledge about radiation signs in the female gender category is higher with a total of 53 people compared to the male category, namely with a total of 29 people.

Based on the data table above, the level of knowledge among women is higher than that of men. In theory, women achieve more than men because women have a high motivation to learn, while men tend to be indifferent to motivation and lazy (Zahroh, 2008).

This research is in line with the research of Setya Enti Rikomah (2020) which states that women are more concerned and the sources of information obtained by women are likely to be more numerous due to the fact that women often interact and are more active than men in the social world of society.

The statistical results with the chi-square test with a p value = 0.390 (p value <0.05) so that Ho is accepted and Ha is rejected, it can be concluded that there is no significant relationship between knowledge and gender. This study is in line with research conducted by Hardani et al. (2022), that there is no difference in knowledge by gender, this occurs because both men and women can obtain information from various sources so that it does not affect the level of knowledge. The study is also supported by Maidartati et al. (2021) that there is no relationship between gender and the level of knowledge. This study is also in line with research by Inriana (2016), that there is no significant difference in knowledge, this occurs because women participate in studies tend to be fewer so that the motivation to increase knowledge is reduced.

Based on the results of this study, it can be concluded that, in the male category, the lowest level of knowledge in the questionnaire that has been filled out by the family of the outpatient is in question number 6 with the question "What is the meaning of the skull sign in the picture below?" with a total of 14 wrong answers, then in question number 5 with the question "What is the meaning of the sign of the person running below?" a total of 12 wrong answers and in question number 7 with the question "What is the meaning of the red color in the picture below?" with a total of 12 wrong answers. The level of knowledge based on gender in the Radiology Installation of West Pasaman Regional Hospital, the family of female outpatients has a higher level of knowledge compared to the level of knowledge of men, according to the author this is caused by women having a more caring nature towards sources of information and high curiosity so that the possibility of getting more information and men tend to have an indifferent attitude and less concern for the surrounding environment which allows for a lack of getting information.

3. Level of Knowledge based on Education

Based on table 6, the level of knowledge about radiation signs based on education with the elementary school category having a knowledge level of 14 people and a high level of 4 people with a total of 18 people, in the junior high school category having a knowledge

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level of 10 people and a high level of 9 people with a total of 19 people, then in the high school category having a knowledge level of 7 people and a high level of 14 people with a total of 21 people, and in the bachelor's category having a knowledge level of 1 person and a high level of 23 people with a total of 24 people. The level of knowledge about radiation signs based on education with the bachelor's category having the highest total level of knowledge with a total of 24 people compared to high school, middle school, and elementary school.

This research aligns with Richa Yuswantina's (2019) research, which showed that the higher a person's education, the higher their level of knowledge. This research also aligns with Octarina Sofyan's (2022) research, which states that the higher the education level, the greater the knowledge level.

The results of the statistical test using the chi-square test with a p value = 0.000 (p value <0.05) so that Ho is rejected and Ha is accepted, it is concluded that there is a significant relationship between knowledge of radiation signs and education.

According to Notoatmodjo (2018) which states that education will affect a person's cognitive in increasing knowledge even though knowledge is not actually formed only by education alone but there are other sub-fields that will also affect a person's knowledge such as experience, information, personality and others, so that if education is low, then the possibility of a low level of knowledge is also low. According to Notoatmodjo (2008) Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual strength, religion, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. According to Aditya Ariwibowo's theory (2013) states that the higher a person's level of education, the better their mindset is in digesting information that can underlie the person's behavioral patterns.

This research is in line with Purwati's (2013) research. It cannot be denied that the higher a person's education, the more information they receive, and ultimately the more knowledge they have. Conversely, if a person's level of education is low, it will hinder the development of a person's attitude towards newly introduced information and values. This research is in line with Ayu Dharmawati's (2016) research which states that it cannot be denied that the higher a person's education, the more information they receive, and ultimately the more knowledge they have. Conversely, if a person's level of education is low, it will hinder the development of a person's attitude towards receiving newly introduced information and values. And this research is also in line with Tri Indah Septiyani's (2019) research which states that the lower a person's education, the less knowledge and information they obtain.

Based on the results of this study, it can be concluded that, in the elementary school category, the lowest level of knowledge in the questionnaire that has been filled out by the family of the outpatient is in question number 3 with the question "What does the picture below mean?" with a total of 12 wrong answers, then in question number 1 with the question "What is the meaning of radiation?" a total of 10 wrong answers and in question number 2 with the question "what is the impact/effect of radiation on the body?" with a total of 10 wrong answers. The level of knowledge based on education in the Radiology Installation of West Pasaman Regional Hospital has the highest level of knowledge in the undergraduate category which is caused by the higher a person's education, the higher the level of knowledge and curiosity of a person. Then the lowest category is in elementary school which is caused by low education resulting in a lower level of knowledge and curiosity of a person.

4. Conclusions and Suggestions

The respondents studied described that the families of outpatients in the radiology installation of West Pasaman Regional Hospital had the highest level of knowledge category in the high category, namely 52 people (61.0%), then low, namely 30 people (39.0%).3. The results of the statistical test with the chi-square test with a p value = 0.019 (p value = <0.05) so that Ho is rejected and Ha is accepted, then there is a significant relationship between

knowledge of radiation signs with age then the results of the statistical test with the chi-square test with a p value = 0.390 (p value = <0.05) so that Ho is accepted and Ha is rejected, then there is no significant relationship between knowledge of radiation signs with gender. And the results of the statistical test with the chi-square test with a p value = 0.000 (p value = <0.05) so that Ho is rejected and Ha is accepted, then there is a significant relationship between knowledge of radiation signs with education in the radiology installation of West Pasaman Regional Hospital.

Suggestion

It would be best for the hospital to educate each patient's family about the radiation hazard signs and how to interpret the images. In addition,radiation hazard posters or signs are larger so they are easy for the patient's family to see, read and understand.

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