
The Relationship Between Knowledge Level and Anxiety Level During CT Scan Examinations at the Radiology Department of Level II Prof. Dr. J. A. Latumetten Hospital

Niwele Amelia^{1)*}, Malisngorar Maritje²⁾, Niwele Dea³⁾
^{1,2,3)}Program Studi DIII Radiologi STIKes Maluku Husada

*Corresponding Author
Email : amelianiwele11@gmail.com

Abstract

Computed Tomography (CT) Scan is a diagnostic imaging procedure that combines X-ray technology and computer processing to produce detailed cross-sectional images of the human body. Despite its diagnostic benefits, undergoing a CT Scan can provoke anxiety in patients, often due to limited understanding of the procedure, concerns about radiation exposure, and uncertainty regarding the examination results. Elevated anxiety levels may compromise patient comfort and interfere with the examination process. This study aimed to examine the relationship between patients' knowledge about the CT Scan procedure and their anxiety levels during examinations at the Radiology Department of RUMKIT TK II Prof. Dr. J.A. Latumeten. A quantitative research design with a cross-sectional approach was employed. Total sampling was used, involving 30 patients who underwent CT Scan examinations. Data were collected using structured questionnaires and analyzed using the Chi-Square statistical test to determine the association between knowledge and anxiety levels. The results indicated that there was no significant relationship between patients' level of knowledge and their anxiety during CT Scan examinations, as evidenced by a significance value of 0.674, which is greater than the 0.05 threshold. This finding suggests that patients' knowledge alone does not significantly influence anxiety levels during the procedure. Other factors, such as prior experiences with medical imaging, current health conditions, and environmental or staff support, may also play a role in shaping patients' anxiety. In conclusion, while knowledge about the CT Scan procedure is important, it does not appear to directly reduce patient anxiety. Health practitioners should consider a holistic approach, addressing psychological, environmental, and experiential factors to minimize anxiety and improve patient comfort and cooperation during CT Scan examinations.

Keywords: Knowledge, Anxiety, CT Scan Examination

INTRODUCTION

CT Scan (Computed Tomography Scan) is a diagnostic support tool used to examine human body organs by utilizing X-rays through modern tomographic equipment and computer-assisted technology (Iqbalawaty et al., 2019). The purpose of a CT scan is to use ionizing radiation to detect abnormalities in body organs without the need for surgical procedures and to obtain more accurate diagnostic results (Amraini & Setiawan, 2024). Knowledge is the result of knowing, which occurs after an individual performs sensory perception of an object (Huzaifah & Iswara, 2023). Sensory perception takes place through the human senses, namely hearing, sight, smell, taste, and touch. Most human knowledge is acquired through the eyes and ears (Jung, 2021). Knowledge plays a very important role in the formation of a person's actions, because based on experience and research, behavior that is grounded in knowledge tends to be more enduring than behavior that is not based on knowledge (Notoatmodjo, 2012).

Anxiety is a psychological condition in which an individual is overwhelmed by feelings of fear and worry, resulting in apprehension and concern about uncertain future events. Anxiety originates from the Latin word *anxius* and the German word *angst*, which describe negative influences or physiological stimulation (Muyasaroh et al., 2020). Anxiety occurs when an individual experiences stress that leads to feelings of nervousness, worried thoughts, and physical reactions such as increased heart rate, elevated blood pressure, and others (Muyasaroh et al., 2020).

Based on the results of a survey conducted by the researcher at RUMKIT TK II Prof. Dr. J. A. Latumetten, the data obtained showed that in 2022 there were 440 patients, in 2023 there were 717 patients, and in 2024 there were 1,081 patients. Meanwhile, in January 2025 there were 68 patients, February 80 patients, March 67 patients, and April 59 patients. The total number of patients from

January to April 2025 was 274 patients who experienced anxiety during CT scan examinations. Based on these findings, the author is interested in conducting further research through a survey presented in the form of a scientific paper entitled “The Relationship Between Knowledge Level and Anxiety Level During CT Scan Examinations at the Radiology Department of RUMKIT TK II Prof. Dr. J. A. Latumetten.”

RESEARCH METHODS

This study employs a quantitative approach, which is defined as a research method grounded in positivist philosophy and used to examine a particular population or sample. The quantitative approach enables data collection through standardized research instruments, with data analysis conducted using statistical techniques aimed at testing predetermined hypotheses. Quantitative data are presented in the form of numbers and statistics, thereby facilitating the interpretation of research findings.

The instrument used in this study is the State-Trait Anxiety Inventory (STAI) questionnaire, which consists of four answer options for each statement item. Each item is scored using a scale of 1–4 with the following descriptions for State Anxiety: 1 = not feeling at all, 2 = feeling slightly, 3 = feeling moderately, and 4 = feeling very much. The total score range for each section (state anxiety and trait anxiety) is between 20 and 80. Anxiety data are obtained by summing the scores of all items in the STAI questionnaire.

Data analysis is conducted in two stages. First, univariate or descriptive analysis is used to describe respondent characteristics individually and collectively through frequency distributions and proportions (Notoatmodjo, 2012). The data collection tool used is a questionnaire sheet containing a list of questions to be completed by respondents as a means of obtaining information related to anxiety levels. Second, bivariate analysis is used to examine relationships or differences between two variables. This study applies a cross-sectional design, in which data are collected at a single point in time to identify the relationship between patients’ knowledge levels and anxiety levels during CT scan examinations. Further statistical analysis is then performed to assess the significance of the relationships between variables.

RESULTS AND DISCUSSION

Results of Univariate Analysis

Level of Knowledge About CT Scan Examination

Table 1. Distribution of Knowledge Levels About Previous CT Scan Examinations Among Patients at RUMKIT TK II Prof. Dr. J. A. Latumetten

CT Scan Examination	(n)	(%)
Good	15	50.0
Fair	13	43.3
Poor	2	6.7
Total	30	100.0

Based on Table 1, the results show that the majority of respondents had a good level of knowledge, totaling 15 people (50.0%), followed by the fair category with 13 people (43.3%), and the poor category with 2 people (6.7%). Thus, it can be concluded that most patients possessed good knowledge regarding CT scan examinations.

Patients’ Anxiety Levels

Table 2. Distribution of Anxiety Levels Toward CT Scan Examinations Among Patients at RUMKIT TK II Prof. Dr. J. A. Latumetten

Anxiety Level	(n)	(%)
No Anxiety	2	6.7

Mild Anxiety	2	6.7
Moderate Anxiety	4	13.3
Severe Anxiety	14	46.7
Panic	8	26.7
Total	30	100.0

The distribution of anxiety levels indicates that most respondents experienced severe anxiety, totaling 14 people (46.7%), followed by the panic category with 8 people (26.7%), moderate anxiety with 4 people (13.3%), mild anxiety with 2 people (6.7%), and no anxiety with 2 people (6.7%). These results indicate that the majority of patients experienced severe anxiety while undergoing CT scan examinations.

Analysis of Knowledge Level About CT Scan Examination and Anxiety Level Among Patients

Table 3. Distribution of Respondents' Knowledge Levels About CT Scan Examinations and Anxiety Levels Among Patients at RUMKIT TK II Prof. Dr. J. A. Latumetten

Knowledge	Anxiety						Total			
	No Anxiety	N	%	Mild	N	%	Moderate	N	%	
Good	0	0	1	6.7	2	13.3	8	53.3	4	26.7
Fair	2	15.4	1	7.7	2	15.4	4	30.8	4	30.8
Poor	0	0	0	0	0	0	2	100.0	0	0
Total	2	6.7	2	6.7	4	13.3	14	46.7	8	26.7

Based on Table 3 above, the cross-tabulation analysis shows that respondents with good knowledge mostly experienced severe anxiety (53.3%) and panic (26.7%). Respondents with fair knowledge also mostly experienced severe anxiety (30.8%) and panic (30.8%). All respondents with poor knowledge experienced severe anxiety (100%).

Chi-Square Test Results

Table 4. Chi-Square Test Results on the Distribution of Respondents' Knowledge Levels About CT Scan Examinations and Anxiety Levels Among Patients at RUMKIT TK II Prof. Dr. J. A. Latumetten

Statistical Test	Value	df	p-value	(Sig. 2- sided)	Description
Pearson Chi-Square	5.758	8	0.674		Not significant
Likelihood Ratio	7.201	8	0.515		Not significant
Linear-by-Linear Association	0.469	1	0.494		Not significant
Contingency Coefficient	0.401	-	0.674		Weak, not significant relationship
Valid Cases (N)	30				

Based on the Chi-square test, a p-value of 0.674 (> 0.05) was obtained, indicating that there is no significant relationship between patients' knowledge levels and anxiety levels during CT scan examinations. The contingency coefficient value of 0.401 indicates a weak relationship, which is not statistically significant. This finding suggests that although patients may have good knowledge about CT scan examinations, many still experience severe anxiety, indicating that factors other than knowledge are likely to influence patients' anxiety levels (Schupp et al., 2005).

This study is consistent with several previous studies stating that patient anxiety during radiological procedures is more strongly influenced by emotional and situational factors than by knowledge level alone (Mueller et al., 2000). Patients with high levels of knowledge may actually experience increased anxiety when the information they receive emphasizes risks or side effects of the procedure (Andersen & Tewfik, 1985). Conversely, patients with limited knowledge may feel calmer when they receive adequate emotional support from healthcare providers (Huang et al., 2020). Therefore, health education provided to patients should be accompanied by psychological approaches

and therapeutic communication, rather than being limited to the delivery of factual information alone (Auerbach et al., 1983). Thus, this study emphasizes that patients' knowledge regarding CT scans is indeed important but not sufficient to significantly reduce anxiety (Heyer et al., 2015). Greater attention should be given to psychological and environmental factors that accompany patients during examination procedures (Carlsson & Carlsson, 2013).

CONCLUSIONS

Based on the results of the univariate analysis, it can be concluded that patients' level of knowledge regarding CT scan examinations at the Radiology Department of RUMKIT TK II Prof. Dr. J. A. Latumetene falls within the good category. This indicates that most patients already have an adequate understanding of the procedures and purposes of CT scan examinations. The univariate analysis of anxiety levels shows that the majority of patients at the Radiology Department of RUMKIT TK II Prof. Dr. J. A. Latumetene experience high levels of anxiety, with a predominance of severe anxiety. This condition indicates that even though patients' knowledge levels are generally good, anxiety remains a significant issue when undergoing CT scan examinations. Furthermore, based on the results of the bivariate analysis, it can be concluded that there is no significant relationship between patients' knowledge levels about CT scan examinations and the level of anxiety experienced by patients. This finding suggests that having a good level of knowledge does not necessarily have a direct influence on reducing patients' anxiety when undergoing CT scan examinations.

REFERENCES

- Amraini, A., & Setiawan, E. (2024). Penatalaksanaan Pemeriksaan CT-Scan Cardiac Dengan Modifikasi Tatalaksana Pada Kasus Heart Rate Tinggi Di Rumah Sakit Primaya Tangerang. *Termometer: Jurnal Ilmiah Ilmu Kesehatan Dan Kedokteran*, 2(1), 66–71.
- Andersen, B. L., & Tewfik, H. H. (1985). Psychological reactions to radiation therapy: Reconsideration of the adaptive aspects of anxiety. *Journal of Personality and Social Psychology*, 48(4), 1024–1032. <https://doi.org/10.1037/0022-3514.48.4.1024>
- Auerbach, S. M., Martelli, M. F., & Mercuri, L. G. (1983). Anxiety, information, interpersonal impacts, and adjustment to a stressful health care situation. *Journal of Personality and Social Psychology*, 44(6), 1284–1296. <https://doi.org/10.1037/0022-3514.44.6.1284>
- Carlsson, S., & Carlsson, E. (2013). 'The situation and the uncertainty about the coming result scared me but interaction with the radiographers helped me through': A qualitative study on patients' experiences of magnetic resonance imaging examinations. *Journal of Clinical Nursing*, 22(21–22), 3225–3234. <https://doi.org/10.1111/jocn.12416>
- Heyer, C. M., Thüring, J., Lemburg, S. P., Kreddig, N., Hasenbring, M., Dohna, M., & Nicolas, V. (2015). Anxiety of Patients Undergoing CT Imaging—An Underestimated Problem? *Academic Radiology*, 22(1), 105–112. <https://doi.org/10.1016/j.acra.2014.07.014>
- Huang, L., Wang, Y., Liu, J., Ye, P., Chen, X., Xu, H., Qu, H., & Ning, G. (2020). Factors Influencing Anxiety of Health Care Workers in the Radiology Department with High Exposure Risk to COVID-19. *Medical Science Monitor : International Medical Journal of Experimental and Clinical Research*, 26, e926008-1-e926008-9. <https://doi.org/10.12659/MSM.926008>
- Huzaifah, Z., & Iswara, W. (2023). Hubungan Komunikasi Efektif Terhadap Kecemasan Pasien Dengan Pemasangan Kateter Di IGD. *Journal of Nursing Invention*, 4(1), 35–41.
- Iqbalawaty, I., Machillah, N., Farjriah, F., Abdullah, A., Yani, M., Ilzana, T. M., Rahmi, C. R., & Khaled, T. M. (2019). Profil hasil pemeriksaan CT-Scan pada pasien tumor paru di Bagian Radiologi RSUD Dr. Zainoel Abidin periode Juli 2018-Oktober 2018. *Intisari Sains Medis*, 10(3). <https://doi.org/10.15562/ism.v10i3.661>

- Jung, H. (2021). Basic physical principles and clinical applications of computed tomography. *Progress in Medical Physics*, 32(1), 1–17.
- Mueller, P. R., Biswal, S., Halpern, E. F., Kaufman, J. A., & Lee, M. J. (2000). Interventional Radiologic Procedures: Patient Anxiety, Perception of Pain, Understanding of Procedure, and Satisfaction with Medication—A Prospective Study. *Radiology*, 215(3), 684–688. <https://doi.org/10.1148/radiology.215.3.r00jn33684>
- Muyasaroh, H., Baharudin, Y. H., Fadjarin, N. N., Pradana, T. A., & Ridwan, M. (2020). Kajian Jenis Kecemasan Masyarakat Cilacap dalam menghadapi Pandemi Covid 19. *Lp2m Unugha Cilacap*, 3.
- Notoatmodjo, S. (2012). Promosi kesehatan dan perilaku kesehatan. *Jakarta: Rineka Cipta*, 193.
- Schupp, C. J., Berbaum, K., Berbaum, M., & Lang, E. V. (2005). Pain and Anxiety during Interventional Radiologic Procedures: Effect of Patients' State Anxiety at Baseline and Modulation by Nonpharmacologic Analgesia Adjuncts. *Journal of Vascular and Interventional Radiology*, 16(12), 1585–1592. <https://doi.org/10.1097/01.RVI.0000185418.82287.72>