Factors Affecting Anxiety Level Before Examination Electrocardiogram (ECG) in Heart Clinic

Nur Isnaini[1(✉)] and Taufanti Yunitasari[2]

[1] Medical Surgical Nursing, Faculty of Health Science, University of Muhammadiyah Purwokerto, Purwokerto, Indonesia 53182
nurisnaini@ump.ac.id
[2] Cardiologist Nurse, Banyumas Hospital, Purwokerto, Indonesia 53192

Abstract. Introduction: Anxiety will affect the results of the Electrocardiogram (EKG) so that these worry factors need to be known so that they can be minimized and solutions are found. Purpose: To see what factors influence the patient's anxiety before the ECG examination Method: This research uses descriptive analytic method with cross sectional approach. The population in this study were all new patients with indications of ECG installation at the Heart Clinic of RSUD Banyumas by 60 respondents, a large sample of 52 respondents who were taken by purposive sampling with data analysis using Chi Square. Data were collected using the ZSAS questionnaire with interview techniques. Results. The results showed that the factors that influenced the level of anxiety before the ECG installation were gender, p value 0.000, age, p value 0.177, education level, p value 0.730, occupation, p value 0.016, ECG examination results, p value 1,000, installation of ECG electrodes, p value 0.029, ECG examination room p value 0.001. Conclusion. The conclusion of the relationship between gender, occupation, ECG installation and ECG examination room with the level of anxiety before the installation of the ECG and there is no relationship between age, education, results of the ECG examination with the level of preparation before the installation of the ECG. Originality. Factor influencing the level of anxiety before ECG installation is gender $p = 0.000$, occupation $p = 0.016$, ECG electrode installation $p = 0.029$, ECG examination room $p = 0.001$.

Keywords: Anxiety · ECG examination

1 Introduction

Cardiovascular disease is one of the main health problems in both developed and developing countries. In the world's population, 17.5 million people (31%) of the 58 million deaths are caused by heart disease [1]. The prevalence of heart disease in Indonesia (doctor's diagnosis) in the population of all ages is 1.5%. According to the results of the recapitulation in Central Java Province 2017, people with heart disease were 3.61%. According to data from medical records in 2018 at the heart clinic Banyumas Hospital,

I. Permana and E. Rochmawati (Eds.): ICOSI-HSN 2022, 55, pp. 239–247, 2022.
https://doi.org/10.2991/978-94-6463-070-1_29

the number of patients with heart disease from January 2018 to December 2018 was 19339 patients. Meanwhile, the number of visits for patients with heart failure from January 2018 to December 2018 was 6706 patients (18).

The ECG examination is not an invasive procedure, but a phenomenon that occurs in the Heart Clinic of the Banyumas Hospital there is a level of worry and anxiety experienced by patients who will have an ECG examination, so that it can affect the results of ECG readings such as the appearance of tachycardia and arrhythmias. The results of research conducted by [2] showed that anxiety will result in an increase in sympathetic nerve activity and will release catecholamine hormones which cause the pulse rate to increase and at the same time increase the heart's need for oxygen. Anxiety conditions in panic disorder usually occur suddenly, can increase to very high accompanied by symptoms similar to heart problems, namely pain in the chest, palpitations, cold sweats, to feeling like suffocating. Certain situation or series of events and usually not previously experienced [3].

Anxiety is a vague fear accompanied by feelings of uncertainty, helplessness, isolation, and insecurity. Anxiety is an emotional state without a specific object, it is triggered by the unknown and accompanies all new experiences [4]. Anxiety is a psychological problem that is influenced by various factors. Factors that can affect anxiety are predisposing factors (psychoanalytic, interpersonal, family, biological factors) and precipitation factors (age, gender, education, personality type and environment).

2 Method

The type of research used is descriptive analytic with the approach used in this research is cross sectional. The study was conducted at the Heart Clinic of the Banyumas Hospital with an implementation time of November 28 to December 28, 2019. The population in this study were all new patients who would undergo an ECG examination at the Heart Clinic of the Banyumas Hospital. Samples were taken by purposive sampling with inclusion criteria: new patients came to the Heart Clinic of RSUD Banyumas, patients aged between 18–75 years, cooperative patients, willing to be respondents, patients were able to read and write, patients had no hearing loss and patients had no mental disorders. Measurement of anxiety variables using the ZSAS questionnaire and interview techniques.

3 Results and Discussion

The result of the study can be initially seen on Table 1 below.

Based on Table 1, the results of the study found that most of the respondents were female (59.6%), elderly (82.7%), basic education (61.5%), working (57.7%), with ECG examination results abnormal (59.6%), uncomfortable ECG electrode placement (86.5%), uncomfortable ECG examination room (84.6%), and mild anxiety level of 78.2%.

Based on Table 2, the results show that there is a relationship between gender and anxiety levels with a p value of 0.000. In this study, 10 male patients (47.6%) were not anxious and 11 patients (52.4%) experienced anxiety, while 1 (3.2%) female patients

Table 1. Distribution of Factors Affecting Anxiety Levels Before ECG Examination at the Heart Clinic of Banyumas Hospital

Variable	n	Percentage (%)
Gender a. Man b. Woman	21 31	40.4 59.6
Age a. mature b. elderly	9 43	17.3 82.7
Education a. Basic education b. Further education	32 20	61.5 38.5
Work a. Working b. Doesn't work	30 22	57.7 42.3
ECG Examination Results a. normal b. abnormal	21 31	40.4 59.6
ECG Electrode Installation a. comfortable b. uncomfortable	7 45	13.5 86.5
ECG Examination Room a. comfortable b. uncomfortable	8 44	15.4 84.6
Anxiety Level a. don't worry b. worried	11 41	21.2 78.2

Table 2. Relationship between gender and anxiety level before EKG pemasangan

	Level of anxiety before EKG installation						
Gender	Don't worry		Worried		Total		p-value
	n	%	n	%	n	%	
Man	10	47.6	11	52.4	21	100	0.000
Woman	1	3.2	30	96.8	31	100	

did not experience anxiety. 30 patients (96.8%) experienced anxiety, it can be concluded that female patients tend to be more anxious than men, in line with research [5] which states that the average anxiety level of male patients is lower than the anxiety level of female patients.

Table 3. Relationship between age and anxiety level before installation of EKG

	Level of anxiety before EKG installation						
Age	Don't worry		Worried		Total		p-value
	n	%	n	%	n	%	
mature	0	0	9	100	9	100	0.177
elderly	11	25.6	32	74.4	43	100	

Table 4. Relationship of education with anxiety level before EKG installation

	Level of anxiety before EKG installation						
Education	Don't worry		Worried		Total		p-value
	n	%	n	%	n	%	
Basic education	6	18.8	26	81.3	32	100	0.730
Further education	5	25.0	15	75.0	20	100	

From the results of this study, the researchers found that anxiety disorders were more often experienced by women than men, women had higher levels of anxiety than male subjects. This is because women are more sensitive to their emotions, which in turn are sensitive to feelings of anxiety. This difference is not only influenced by emotional factors, but also influenced by cognitive factors. Women tend to see life or events they experience in detail, while men tend to think globally or not in detail. Individuals who see more detail, will also be more easily afflicted by anxiety because they have more information and it can eventually actually suppress their feelings [4].

Based on Table 3, the results showed that there were no adult patients who experienced anxiety levels, 9 patients experienced anxiety (100%). Elderly patients who did not experience anxiety were 11 (25.6%), who experienced anxiety were 32 (74.4%). Statistical test results obtained p-value (Fisher's Exact Test) is 0.177, this means that the p-value >0.05 so Ho is accepted and Ha is rejected and it can be interpreted that statistically there is no relationship between age and anxiety level before the ECG installation.

Age is correlated with experience, experience is correlated with knowledge, understanding and views of a disease or event so that it will form perceptions and attitudes. Maturity in thought processes in adults are more likely to use good coping mechanisms than children in the age group. This research assumes that the more mature a person is, the higher the level of coping mechanisms against a stressor [6].

Researchers argue that as a person ages, the functions in the body decrease, one of which is heart function. So that most of the patients with heart problems are elderly. This is not in line with the theory described by [4] which states that someone who has a younger age is more prone to anxiety disorders than someone who is older.

Based on Table 4, the results showed that patients with basic education did not experience anxiety as many as 6 (18.8%), who experienced anxiety as many as 26

Table 5. Relationship between work and anxiety levels before EKG installation

	Level of anxiety before EKG installation						
Work	Don't worry		mild anxiety		Total		p-value
	n	%	n	%	n	%	
work	10	33.3	20	66.7	30	100	0.016
Doesn't work	1	4.5	21	95.5	22	100	

(81.3%). Patients with advanced education who did not experience anxiety as many as 5 (25.5%), anxiety as many as 15 (75.0%). Statistical test results obtained p-value (Fisher's Exact Test) is 0.730, this means that the p-value >0.05 so Ho is accepted and Ha is rejected and it can be interpreted that statistically there is no relationship between education and anxiety levels before the ECG installation.

There is a theory that states that someone with a higher level of education tends to demand or criticize a lot of services received. Some people with low levels of education tend to be more accepting because they don't know what they need, as long as getting well is enough [7]. The higher a person's education, the more he will take advantage of health services, while people with low education tend to persist not using health services unless there are really serious complaints. The level of education also determines whether or not a person easily absorbs and understands knowledge about the actions to be taken. This is in line with the theory which states that education is necessary for a person to be more responsive to health problems and can take action as soon as possible [8]. Lack of education status in a person will cause that person to experience anxiety or stress more easily than those with higher educational status [9].

Based on Table 5, the results showed that 10 (33,3%) working patients did not experience anxiety, 20 (66.7%). Patients who do not work who do not experience anxiety are 1 (4.5%), who experience anxiety are 21 (95.5%). Statistical test results obtained p-value (Fisher's Exact Test) of 0.016, this means that the p-value <0.05 so Ho is rejected and Ha is accepted and it can be interpreted that statistically there is a relationship between work and anxiety levels before the ECG installation.

The results showed a relationship between work and anxiety levels with a p value of 0.042, in line with research conducted [10] which states that there is a relationship between work and anxiety levels with a p value of 0.005. Based on research [11]. It is known that low socioeconomic communities have more psychiatric prevalence. Low economic status occurs because the work they do does not meet their daily needs. Work is one of the factors in the social structure that can encourage someone to take action for their health. People who work tend to have higher expectations than people who do not work for health services [8].

From the results of this study, the researcher argues that someone who works or does not work has a risk in dealing with stressors, depending on the level of each individual in dealing with problems. Someone who has a job will pay more attention to health than people who do not work, they tend to seek and explore information about health. Feelings of anxiety can be a response to uncertain threats and unwanted events, threats

Table 6. The relationship between the results of the ECG examination with the level of anxiety before the installation of ECG

ECG Results	Level of anxiety before EKG installation						p-value
	Don't worry		Worried		Total		
	n	%	n	%	n	%	
normal	4	19.0	17	81.0	21	100	1,000
Abnormal	7	22.6	24	77.4	31	100	

Table 7. The relationship between the installation of ECG electrodes and the level of anxiety before the installation of the ECG

ECG electrode placement	Level of anxiety before EKG installation						p-value
	Don't worry		Worried		Total		
	n	%	n	%	n	%	
comfortable	4	57.1	3	42.9	7	100	0.029
Uncomfortable	7	15.6	38	84.4	45	100	

are usually felt in the face of the risk of losing a job or not receiving a bonus, demotion or worsening working conditions if sick, especially with complaints that lead to heart disease [12].

Table 6 shows that patients with normal ECG results did not experience anxiety as much as 4 (19.0%), anxiety as much as 17 (81.0%). Patients with abnormal ECG results did not experience anxiety as much as 7 (22.6%), anxiety as many as 24 (77.4%). Statistical test results obtained p-value (Fisher's Exact Test) of 1,000, this means that the p-value $>$ 0.05 so that Ho is accepted and Ha is rejected and it can be interpreted that statistically there is no relationship between the ECG results and the level of anxiety before the ECG installation.

ECG can provide data that supports the diagnosis and in some cases is important for patient management, ECG is important for the diagnosis and management of heart rhythm disorders, ECG helps diagnose causes of chest pain and the appropriate use of thrombolysis in myocardial infarction, ECG can help diagnose causes of shortness of breath [13]]. The results of this study indicate that there is no relationship between the results of the ECG examination and the level of anxiety before the ECG installation, the researchers believe that patients with abnormal ECG results tend to surrender and accept their illness, and will routinely control to maintain their health condition.

Table 7 shows that patients who are comfortable with the installation of ECG electrodes do not experience anxiety as many as 4 (57,1%%), who experience anxiety as much as 3 (42,9%). Patients who are uncomfortable with the ECG installation are not anxious as many as 7 (15.6%), who experience anxiety are 38 (84.4%). Statistical test results obtained p-value (Fisher's Exact Test) of 0.029, this means that the p-value $<$ 0.05 so Ho is rejected and Ha is accepted and it can be interpreted that statistically

Table 8. The relationship between the ECG examination room and the level of anxiety before EKG installation

ECG examination room	Level of anxiety before EKG installation						p-value
	Don't worry		Worried		Total		
	n	%	n	%	n	%	
Comfortable	6	75.0	2	25.0	7	100	0.001
Uncomfortable	5	11.4	39	88.6	45	100	

there is a relationship between the installation of ECG electrodes and the level of anxiety before the ECG installation.

The results of the analysis of the relationship between the installation of the ECG electrode and the level of anxiety showed a p value of 0.025 which means that there is a relationship between the installation of the ECG electrode and the level of anxiety. Research [14] showed disastrous thoughts also mediate the effects of procedural anxiety and inability to perceive unpleasant bodily sensations. Unpleasant experiences tend to cause a level of anxiety about the action to be taken, especially if it is the first experience experienced by the patient. This study was conducted on respondents who visited the Heart Clinic at the Banyumas Hospital for the first time, causing a level of anxiety about the ECG examination that would be carried out, especially during the installation of the ECG electrodes. In line with research [15] which states that the use of flexible polymer-based ECG electrodes can optimize patient comfort without changing the results of the ECG waveform.

Table 8 shows that patients who are comfortable with the ECG examination room are not anxious as many as 6 (75.0%), anxious as much as 2 (25.0%). Patients who are uncomfortable with the ECG examination room are not anxious as many as 5 (11,4%), anxious as many as 39 (88,6%). Statistical test results obtained p-value (Fisher's Exact Test) of 0.000, this means that the p-value < 0.05 so that Ho is rejected and Ha is accepted and it can be interpreted that statistically there is a relationship between the installation of ECG electrodes and the level of anxiety before the ECG installation.

The EKG examination room is a place where an ECG examination is performed, if patients have never had an ECG examination they tend to feel anxious and worried, according to [9, 16] someone who is in a foreign environment is more likely to experience anxiety than when he is in a normal environment. he occupies. Comfort is everything that shows itself in accordance with and in harmony with the use of a space, both with the space itself and with various shapes, textures, colors, symbols, and signs, sounds and sounds, impressions, intensity and color of light and smell or whatever. Researchers argue that basically human comfort in buildings can be felt physically or non-physically. Physical comfort is based on standard needs while non-physical on human perception. Meanwhile, according to [17] states that in order to get a room with a comfortable temperature it is necessary to classify the level of activity in the room, among others, sleeping, standing, sitting and being active. The comfort of people is usually affected by the temperature of the surrounding surface and also by the air. The comfort felt by the

user or occupant of a room can be in the form of a sense of security and flexibility. The availability of facilities in a room is the main factor of comfort. The comfort achieved by the users is one of the good values of the room.

4 Conclusion

Anxiety of patients who will have an ECG examination at the Heart Clinic on average is mild, namely as much as 50% of the total respondents. The results of the study indicate that the factors that can significantly affect anxiety before the ECG installation are, gender, occupation, ECG electrode installation and ECG examination room. While the factors of age, level of education and the results of the ECG examination did not significantly affect the anxiety of patients who underwent examinations at the Cardiology Clinic.

References

1. WH Organization, *World health statistics 2016: monitoring health for the SDGs sustainable development goals* . World Health Organization, 2016.
2. GJ Huffman, RF Adler, DT Bolvin, and EJ Nelkin, "The TRMM multi-satellite precipitation analysis (TMPA)," in *Satellite rainfall applications for surface hydrology* , Springer, 2010, pp. 3–22.
3. AMS Bonomo and TCCF de Araujo, "Psychological Approach to the Cardiac Arrhythmias: A Focus on the Emotions," in *Cardiac Arrhythmias-New Considerations* , IntechOpen, 2012.
4. F. Stuart, *Down, out, and under arrest: Policing and everyday life in skid row* . University of Chicago Press, 2016.
5. S. Bachri, Z. Cholid, and A. Rochim, "The Differences Patients Anxiety Level Based on Age, Sex, Education level and Tooth Extraction Experience at Dental Hospital, Faculty of Dentistry, University of Jember)," *Health Library.* , vol. 5, no. 1, pp. 138–144, 2017.
6. I. Saputri and DG Wirama, "The Influence of Machiavellian Traits and Personality Types on Auditors' Dysfunctional Behavior," *E-Jurnal Ekon. and Business Univ. Udayana* , vol. 4, no. 2, pp. 70–86, 2015.
7. DB Lumenta, L.-P. Kamolz, and M. Frey, "Adult burn patients with more than 60% TBSA involved–Meek and other techniques to overcome restricted skin harvest availability–the Viennese concept," *J. Burn care Res.* , vol. 30, no. 2, pp. 231–242, 2009.
8. S. Notoatmodjo, H. Anwar, NH Ella, and K. Tri, "Health promotion in schools," *Jakarta: rineka copyright* , pp. 21–23, 2012.
9. D. Watson *et al.* , "Development and validation of the Inventory of Depression and Anxiety Symptoms (IDAS)," *Psychol. Assess.* , vol. 19, no. 3, p. 253, 2007.
10. M. Muzzammil, J. Alam, and M. Zakwan, "A spreadsheet approach for prediction of rating curve parameters," in *Hydrologic modeling* , Springer, 2018, pp. 525–533.
11. W. Qur'ana, "The Relationship between Fulfillment of Spiritual Needs and Anxiety Levels of Preoperative Patients at the Regional Hospital of dr. Soebandi Jember," 2012.
12. A. Jaworek, AT Sobczyk, A. Krupa, A. Marchewicz, T. Czech, and L. liwiński, "Hybrid electrostatic filtration systems for fly ash particles emission control. A review," *Sept. Purif. Technol.* , vol. 213, pp. 283–302, 2019.
13. T. Kitamura, T. Iwami, T. Kawamura, K. Nagao, H. Tanaka, and A. Hiraide, "Bystander-initiated rescue breathing for out-of-hospital cardiac arrests of noncardiac origin," *Circulation*, vol . 122, no. 3, pp. 293–299, 2010.

14. F. Salfi *et al.* , "Gender-related time course of sleep disturbances and psychological symptoms during the COVID-19 lockdown: a longitudinal study on the Italian population," *Neurobiol. Stress* , vol. 13, p. 100259, 2020.
15. Y.-H. Chen *et al.* , "Soft, comfortable polymer dry electrodes for high quality ECG and EEG recording," *Sensors* , vol. 14, no. 12.
16. SJ Sundeen, GW Stuart, ED Rankin, SP Cohen, and C. V Mosby, "Nurse-Client Interaction: Implementing the Nursing Process," *Nursing2021* , vol. 7, no. 5, p. 23, 1977.
17. H. Neumann, C. Neufert, M. Vieth, J. Siebler, K. Mönkemüller, and MF Neurath, "High-definition endoscopy with i-scan enables diagnosis of characteristic mucosal lesions in Whipple's disease," *Endoscopy* , vol . 44, no. S02, pp. E217–E218, 2012.
18. Banyumas Hospital. (2018). Banyumas Hospital Medical Record Report. Manuscript not published.