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Anxiety levels of ICU patients at tertiary referral hospital using Visual Analog Scale for Anxiety (VAS-A)

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Abstract

Patients undergoing treatment in the Intensive Care Unit (ICU) are at risk of experiencing anxiety. If left untreated, anxiety can worsen the patient's condition to the point of prolonging the length of stay in the ICU. To determine the level of anxiety of patients treated in ICU RSUD Dr. Soetomo Surabaya. This research is a descriptive study with a cross-sectional design. The research was conducted at the Rumah Sakit Umum Daerah (RSUD) Dr. Soetomo Surabaya with a data collection period of September - October 2022. The total sample obtained was 45 research subjects. The anxiety level of the study subjects was assessed using the Visual Analog Scale for Anxiety (VAS-A). Author can select Normal style from styles of this template. The results of this study were that all research subjects or as many as 100% of research subjects experienced anxiety. Overall, the research subjects experienced severe anxiety as much as 48.9%, moderate anxiety as much as 37.8%, while mild anxiety as much as 13.3%. The level of anxiety is higher in non-geriatric age (55.9%), female sex (50%), surgical patients (55.6%), research subjects with ventilator (57.1%), and research subjects with the use of invasive devices (53.6%). Most of the research subjects experienced severe anxiety. Analytical tests between anxiety trigger factors and anxiety levels were not carried out.

Keywords: Anxiety level; Intensive Care Unit; VAS-A; Mental health

1. Introduction

Anxiety is the most common emotion faced by patients admitted to the ICU. Anxiety appears as a feeling of discomfort and a non-specific natural response to a pressure that comes from both within and outside the environment of an individual and is characterized by a helpless condition. This is influenced by worries about the future (for example, fear of a failed procedure, fear of dying/not getting up again), lack of information about the disease experienced, and fear of using medical equipment. Based on data analysis from the Johns Hopkins University School of Medicine in 2020 in the United States, out of 100 random samples of adult patients who were treated in the ICU for more than 48 hours, 45 patients (45%) were found to experience anxiety. This figure is quite high indicating that anxiety is found in almost half of the patients. Anxiety itself is more like a symptom than a disease, which if not treated immediately can develop psychologically into depressive disorders and psychosis. While in physiological conditions, the brain will activate the adrenal glands which then release the hormone adrenaline, then stimulate the heart and blood vessels, resulting in an increase in breathing and heart rate, high blood pressure, and hypertension. Anxiety can also affect the patient's overall health condition, such as drastic increases in blood sugar levels, chronic exacerbations, and cardiac arrhythmias. Some of these conditions can weaken the patient's condition which is basically unstable and cause the healing process to take longer. To determine appropriate and effective therapy, medical personnel must first be able to identify and understand the dynamic nature of the anxiety experienced by patients. Many studies have succeeded in developing various anxiety measurement instruments, including the Visual Analog Scale for Anxiety (VAS-A), State-Trait Anxiety Inventory (STAI),

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and Beck's Depression Inventory (BDI). VAS-A has been tested to be more sensitive in detecting anxiety, and can even measure rapid changes in the patient's anxiety level (Labaste, 2019). VAS-A has also proven its reliability and validity so that it can be used in everyday life (Facco, 2011). ICU services consist of three levels of service, namely primary, secondary and tertiary services. Tertiary ICU services are the highest referral for ICU, improving the quality of hospital facilities and services, as well as equipment and medicines. ICU with tertiary care is intended for patients with life-threatening conditions and requires more complete equipment compared to primary and secondary ICU, so that a higher distribution of disease severity is obtained. Studies that examine the anxiety level of ICU patients are still very limited, especially in Indonesia in general and in Surabaya specifically. Because of this, the authors are interested in conducting research that measures the anxiety level of ICU patients at tertiary referral hospital using the Visual Analog Scale for Anxiety (VAS-A), especially at Dr. Soetomo Surabaya.

2. Methods

2.1. Study type

This study is a descriptive research.

2.2. Study design

The research design chosen was a cross-sectional study which aimed to determine the anxiety level of patients treated in the ICU based on age, sex, type of intervention, and length of stay. Anxiety levels were assessed using the Visual Analog Scale for Anxiety (VAS-A).

2.3. Study population and study sample

2.3.1. Study population

The population in this study were all patients treated in the ICU of RSUD Dr. Soetomo Surabaya.

2.3.2. Study sample

The sample is part of the population that meets the inclusion criteria, but is not included in the exclusion criteria. The inclusion and exclusion criteria in this study are:

- Inclusion Criteria
    - Patients aged ≥18 years
    - Patients with GCS 456 or 4x6 if using an endotracheal tube (ETT) or tracheostomy
    - The patient has not used any sedation after at least 24 hours
- Exclusion Criteria
    - Patients aged <18 years
    - The patient has a history of or has been diagnosed with dementia, Alzheimer's, or other degenerative brain diseases

2.3.3. Sample size

The required minimum sample size is 45.

2.3.4. Sampling technique

The sampling technique was carried out using consecutive sampling, in which all samples obtained that met the selection criteria were included in the study until the required sample size was met.

2.4. Study variables and operational definition of variables

Table 1 Operational definition of variables

Variables	Definition	Measuring instrument	Measurement result	Measuring scale
Anxiety level	The level of patient anxiety while being treated in the ICU	VAS-A	Not anxious at all, Mild anxiety, Moderate anxiety, Severe anxiety, and Panic.	Ordinal
Age	The length of time the patient lived from birth to the time the study was conducted	Observation sheet	Geriatric (≥60 years old) Non-geriatric (<60 years old)	Nominal
Sex	Several anatomical and physiological attributes that differentiate between males and females	Observation sheet	Male Female	Nominal
Type of ICU intervention	Actions taken to reduce the patient's painful condition, in this case, are procedures performed in the ICU	Observation sheet	Surgical/non-surgical Ventilator/non-ventilator Invasive/non-invasive devices	Nominal
Length of stay	The time period from the time the patient was first referred to the ICU to the time the study was conducted	Observation sheet	<7 days ≥7 days	Nominal

Note:1. Research subjects who were treated for less than 6 days 12 hours were included in the category of study subjects with length of stay <7 days; 2. Research subjects who were treated for 6 days 12 hours or more than 6 days 12 hours were included in the category of study subjects with a length of stay >7 days.

2.5. Study instrument

The instrument used in this study was the Visual Analog Scale for Anxiety (VAS-A).

2.6. Study site and study period

2.6.1. Study site

This research was conducted in the Intensive Care Unit (ICU) RSUD Dr. Soetomo, Surabaya, East Java.

2.6.2. Study period

Research time starts from January – December 2022.

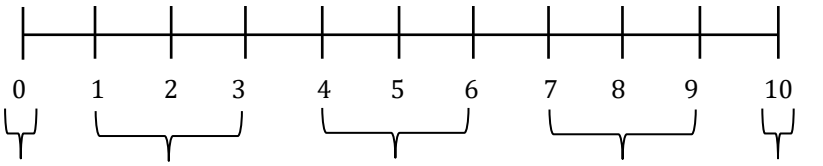
2.7. Data collection

- Data collection was carried out using non-probability sampling, namely using consecutive sampling, in which all samples obtained that met the selection criteria were included in the study until the required sample size was met.
- Research subjects were determined based on inclusion and exclusion criteria. Data collection was carried out a maximum of 24 hours before the study subjects were released from the ICU.
- Researchers provide information for consent and informed consent to guardians/families of research subjects.
- Measurement of anxiety levels is carried out using the Visual Analog Scale for Anxiety (VAS-A) instrument as follows:

Right now, how anxious are you?
Mark it by placing a dash (|) in the following image:

Not anxious at all — Panic

Interpretation of the VAS-A score:



2.8. Data processing and data analysis

2.8.1. Data processing

The data that has been collected will be processed using data processing techniques which include coding, entry and cleaning.

- Coding
  Giving a specific code to each variable to facilitate data entry and analysis.
- Data entry
  Enter data into the computer using software.
- Cleaning Data
  The process of cleaning the data from the possibility of errors during the analysis so that improvements can be made immediately, then grouped by research variables.

2.8.2. Data analysis

The data that has been collected will be processed using computer software applications. The data analysis technique used is univariate analysis or variable descriptive analysis. Variable descriptive analysis aims to describe each variable studied separately by making a frequency table for each variable.

3. Results

3.1. Study site

The research location is located at Dr. Soetomo, Jl. Major General Prof Dr. Moestopo, Surabaya. RSUD Dr. Soetomo is a tertiary referral hospital in East Java which has the duty to carry out health efforts by prioritizing healing (curative) and recovery (rehabilitative) efforts. Researchers conducted research in the Intensive Care Unit (ICU) Room of the Integrated Central Surgery Building (GBPT) RSUD Dr. Soetomo.

3.2. Sample characteristic

Research subjects were taken from September 2022 to October 2022 using the consecutive sampling technique, in which all samples obtained that met the selection criteria were included in the study until the required sample size was met. The population in this study were all patients treated in the ICU of RSUD Dr. Soetomo. Of the 73 patients who met the inclusion criteria, there were 23 patients who were excluded from the study sample. The patients who were excluded included 9 patients who experienced a decline in condition, extended hospitalization in the ICU, difficulty understanding the anxiety rating scale, and 14 other patients who were not allowed to be research subjects by the patient's family. The research samples obtained and met the inclusion criteria totaled 50 research subjects. All data was screened and taken by random sampling according to the required sample size. So that in this study, there were 45 research subjects who were ICU patients at RSUD Dr. Soetomo whose anxiety level was assessed using the Visual Analog Scale for Anxiety (VAS-A). All study subjects were assessed for VAS-A scores at least 24 hours after the final sedative dose was administered.

Table 2 Sample characteristic

Characteristic	N	%
Age		
Geriatric	11	24.4%
Non-geriatric	34	75.6%
Sex		
Male	25	55.6%
Female	20	44.4%
Type of interventions		
Surgical	27	60%
Non-surgical	18	40%
Ventilator	21	46.7%
Non-ventilator	24	53.3%
Invasive devices	28	62.2%
Non-invasive devices	17	37.8%
Length of stay		
<7 days	35	77.8%
≥7 days	10	22.2%

Descriptively, most research subjects were aged less than 60 years (non-geriatrics) with a total of 34 people (75.6%), while 11 people (24.4%) were aged 60 years or more (geriatrics). Most of the research subjects were male with a total of 25 people (55.6%), and women as many as 20 people (44.4%). The research subjects who underwent surgery were 27 people (60%) and 18 people without surgery (40%). A total of 21 people (46.7%) underwent treatment with a ventilator, while 24 people (53.3%) underwent treatment without a ventilator. Most of the research subjects underwent treatment with the help of invasive devices as many as 28 people (62.2%) and 17 people (37.8%) underwent treatment with the help of non-invasive devices. Research subjects who underwent treatment in the ICU for less than 7 days totaled 35 people (77.8%) and for 7 days or more totaled 10 people (22.2%).

3.3. Percentage of anxiety of research subjects based on VAS-A category

3.3.1. Overall percentage of anxiety disorders in ICU patients

Table 3 Overall percentage of anxiety disorders in ICU patients

VAS-A Category	N	%
Not anxious at all	0	0%
Mild anxiety	6	13.3%
Moderate anxiety	17	37.8%
Severe anxiety	22	48.9%
Panic	0	0%
Total	45	100%

All research subjects or as many as 100% of research subjects experienced anxiety. Overall, the research subjects experienced the most severe anxiety, namely 22 people (48.9%). There were 17 subjects (37.8%) who experienced

moderate anxiety, while 6 subjects (13.3%) experienced mild anxiety. There were no research subjects who were in the "not at all anxious" and "extremely anxious" categories.

3.3.2. Anxiety levels of research subjects using VAS-A based on age

Table 4 Distribution of anxiety levels of research subjects based on age

VAS-A	Age	
	Geriatric (n = 11 / 100%)	**Non-geriatric (n = 34 / 100%)**
Not anxious at all	0 (0%)	0 (0%)
Mild anxiety	2 (18.2%)	4 (11.8%)
Moderate anxiety	6 (54.5%)	11 (32.4%)
Severe anxiety	3 (27.3%)	19 (55.9%)
Panic	0 (0%)	0 (0%)

Based on age category, most of the research subjects in the geriatric age category were in the moderate anxiety category with a total of 6 people (54.5%), while research subjects in the non-geriatric age category experienced the most severe anxiety with a total of 19 people (55.9%)).

3.3.3. Anxiety levels of research subjects using VAS-A based on sex

Table 5 Distribution of anxiety levels of research subjects based on sex

VAS-A	Sex	
	Male (n = 25 / 100%)	**Female (n = 20 / 100%)**
Not anxious at all	0 (0%)	0 (0%)
Mild anxiety	6 (24%)	0 (0%)
Moderate anxiety	7 (28%)	10 (50%)
Severe anxiety	12 (48%)	10 (50%)
Panic	0 (0%)	0 (0%)

Most male research subjects were in the severe anxiety category, namely 12 people (48%), while female research subjects had the same number in moderate and severe anxiety categories with a total of 10 people (50%) in each category.

3.3.4. Anxiety levels of research subjects using VAS-A based on type of interventions

Based on table 6, research subjects who underwent treatment in the ICU with surgery experienced the most severe anxiety, namely as many as 15 people (55.6%), while research subjects who did not undergo surgery experienced the most moderate anxiety with a total of 8 people. (44.4%). Study subjects with ventilators experienced the most severe anxiety with a total of 12 people (57.1%), while research subjects without ventilators experienced the most moderate anxiety and severe anxiety with the same number in each category, namely 10 people (41.7%) . The research subjects with the help of invasive devices experienced the most severe anxiety with a total of 15 people (53.6%), while the research subjects with the help of non-invasive devices experienced the most moderate anxiety with a total of 8 people (47.1%).

Table 6 Distribution of anxiety levels of research subjects based on type of interventions

VAS-A	Type of interventions					
	Surgical (n = 27 / 100%)	**Non-surgical (n = 18 / 100%)**	**Ventilator (n = 21 / 100%)**	**Non-ventilator (n = 24 / 100%)**	**Invasive devices (n = 28 / 100%)**	**Non-invasive devices (n = 17 / 100%)**
Not anxious at all	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Mild anxiety	3 (11.1%)	3 (16.7%)	2 (9.5%)	4 (16.7%)	4 (14.3%)	2 (11.8%)
Moderate anxiety	9 (33.3%)	8 (44.4%)	7 (33.3%)	10 (41.7%)	9 (32.1%)	8 (47.1%)
Severe anxiety	15 (55.6%)	7 (38.9%)	12 (57.1%)	10 (41.7%)	15 (53.6%)	7 (41.2%)
Panic	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

3.3.5. Anxiety levels of research subjects using VAS-A based on length of stay

Table 7 Distribution of anxiety levels of research subjects based on length of stay

VAS-A	Length of stay	
	<7 days (n = 35 / 100%)	**≥7 days (n = 10 / 100%)**
Not anxious at all	0 (0%)	0 (0%)
Mild anxiety	5 (14.3%)	1 (10%)
Moderate anxiety	14 (40%)	3 (30%)
Severe anxiety	16 (45.7%)	6 (60%)
Panic	0 (0%)	0 (0%)

Most research subjects with a length of stay of less than 7 days were in the category of severe anxiety with a total of 16 people (45.7%), while research subjects with a length of stay of 7 days or more were in the category of severe anxiety, namely 6 people (60%).

4. Discussion

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4.1. Overall percentage of anxiety disorders in ICU patients

Table 3 shows that all research subjects experience anxiety or as much as 100%. The most research subjects were in the severe anxiety category, namely 22 people or 48.9%. There are no research subjects who do not experience anxiety.

Based on research conducted by Setia in 2012, out of a total of 30 research subjects, it was found that an average of 50.8% of ICU patients experience anxiety. This shows that the number of ICU patients who experience anxiety is more than half of the number of patients. According to Duff and Hollingshead in 1995, they had interviewed 161 patients with experience of being in the ICU, all of whom expressed concern, anxiety and fear. As many as 52% of the total research subjects expressed severe anxiety. The anxiety experienced is related to the threat of disease while the patient is being treated in the ICU. The existence of the ICU is often perceived by patients as a negative experience because patients who are treated in the ICU have no control over the activities they do every day. Patients who are isolated in the ICU tend to

feel anxious (Hudack and Gallo, 1997). Research at a hospital in South Africa described as many as 48% of ICU patients experiencing anxiety, while the rest experienced symptoms of depression (Hatchett et al., 2010).

4.2. Anxiety levels of research subjects using VAS-A based on age

Based on table 4, in terms of age, most research subjects in the geriatric age category were in the moderate anxiety category with a total of 6 people (54.5%), while research subjects in the non-geriatric age category experienced the most severe anxiety with a total 19 people (55.9%).

Age correlates with experience, and experience correlates with understanding, knowledge, and perspective on a disease or event that occurs in such a way as to shape individual perceptions and attitudes. Haynes' research in 1999 showed that individuals at a young age are more susceptible to stress and anxiety. Individuals at a young age are more susceptible to psychological pressure and anxiety, due to immature mental and mental readiness and lack of experience (Maynes, 2000). Research conducted by Bachri in 2016 showed data on anxiety in surgical patients based on age. Geriatric patients have an average level of anxiety lower than non-geriatric patients. Thus, it is known that the older the patient, the lower the level of anxiety. Individuals with an older age have more maturity in thought processes than individuals at a younger age, enabling them to use good coping mechanisms (Lukman, 2009). Other research at the University of North Sumatra explained consistent results, namely the patient's anxiety level is inversely proportional to the patient's age (Bachri et al., 2017).

In this study, the level of anxiety at geriatric age was lower than non-geriatric age, as in previous studies which stated that older research subjects had lower levels of anxiety. This is known to be a protective effect of aging on anxiety. Theory of brain aging models (aging-brain models) explains that there is a decrease in the amygdala's prefrontal ability to respond to emotional stimuli, associated with lower levels of anxiety in older individuals (Clewett et al., 2014).

4.3. Anxiety levels of research subjects using VAS-A based on sex

Based on table 5, the male research subjects were mostly in the severe anxiety category, namely 12 people (48%), while the female research subjects had the same number in the moderate anxiety and severe anxiety categories with a total of 10 people. (50%) in each category.

According to Kaplan and Sadock (2005), anxiety is more common in women. Women experience high levels of anxiety due to excessive autonomic nervous reactions, including increased sympathetic system, increased norepinephrine, increased catecholamine retention, and abnormal serotonergic regulation disorders. According to Myers (Trismiati, 2004), men are more active and explorative than women. Trismiati (2004) states that men are calmer than women and women are more easily influenced by environmental pressures than men. According to Cattel (Trismiati, 2004), women are also more anxious, less patient, and cry more often. According to Maccoby and Jacklin (Trismiati, 2004), women are more anxious than men in various studies on anxiety in general. Another study found that women have a lower pain threshold and tolerance to painful stimuli than men. Sunaryo (2004) presented the theory that men generally have a stronger mentality towards something that is considered threatening than women. Another study at the Manado City Shoulder Health Center in 2013 reported anxiety data on more female patients than male patients.

4.4. Anxiety levels of research subjects using VAS-A based on type of interventions

Based on table 6, research subjects who underwent treatment in the ICU with surgery experienced the most severe anxiety, namely 15 people (55.6%), while research subjects who did not undergo surgery experienced moderate anxiety the most with 8 people. (44.4%). Study subjects with ventilators experienced the most severe anxiety with a total of 12 people (57.1%), while study subjects without ventilators experienced the most moderate anxiety and severe anxiety with the same number in each category, namely 10 people (41.7%) . Research subjects with the help of invasive devices experienced the most severe anxiety with a total of 15 people (53.6%), while research subjects with the help of non-invasive devices experienced the most moderate anxiety with a total of 8 people (47.1%).

Patients undergoing surgery generally experience anxiety. Perioperative anxiety is influenced by the patient's concern about his general health, uncertainty about the future, type of surgery and anesthesia performed, postoperative discomfort and pain, disability, loss of self-control, and fear of death. Anxiety can affect patient recovery as well as decrease patient satisfaction with the perioperative experience. Research conducted by Stamenkovic in 2018 presented data investigating the presence of anxiety disorders in 712 patients undergoing surgery. Estimates of the prevalence of perioperative anxiety range from 25 to 80 percent, peaking on the day of surgery. This shows that surgery is one of the variables that affect patient anxiety.

Based on research conducted by the National Institutes of Health (NIH) in 2003, patients treated in the ICU with mechanical ventilators tend to experience anxiety. Research by Jequelyn and Jose (2001), quoted in the American Journal Critical Care, describes research results in which the environment in the ICU, especially equipment, often causes patient sensory stimuli, sounds or sounds such as monitors, ventilators, mucus suction devices and others make patients anxious and even stressed.

Monitoring or monitoring of patients in the ICU is carried out to improve the quality of patient care. Monitoring in the ICU can be invasive or non-invasive. Invasive monitoring in the ICU includes the use of invasive devices on patients, namely arterial blood pressure monitoring, transesophageal Doppler, central venous pressure (CVP) measurement with a central venous catheter (CVC), pulmonary artery catheterization, arterial blood gas (ABG) analysis, pressure measurement intracranial pressure (ICP), and intra-abdominal pressure (IAP). Monitoring of physiological parameters depends on the patient's underlying disease and the availability of equipment in the ICU (Doradla et al., 2013). Based on research conducted by Delewi in 2017, there is a relationship between anxiety levels and the use of invasive devices, corroborating data from Trotter et al. (2011) who showed that 100 patients undergoing invasive procedures reported scores of severe anxiety. Patients with CVC installation experience the most anxiety during treatment in the ICU. Anxiety symptoms were reported in 76.2% of chronic kidney failure patients undergoing intensive care with central venous catheter (CVC) installation which then affected sleep quality, as well as the risk of inflammation and malnutrition in patients (Buberci et al., 2022). Invasive hemodynamic monitoring is often an anxiety-inducing procedure and difficult for patients to understand because it involves important investigations. Most patients view this as a threat of danger or a challenge to apply psychological pressure. Feelings of anxiety, loss of control, and fear of complications often trigger stress (Delewi et al., 2017).

4.5. Anxiety levels of research subjects using VAS-A based on length of stay

Based on table 7, most research subjects with a length of stay of less than 7 days were in the severe anxiety category with a total of 16 people (45.7%), while research subjects with a length of stay of 7 days or more were mostly in the anxious category weight, namely 6 people (60%).

Research conducted by Nurlindayati et al. in 2015 showed that there was a difference in the average length of stay between anxious and non-anxious patients, which was 1.23 days. Based on the results of the logistic regression test between the variables of anxiety status and length of stay in the study, an RR value of 2.385 was obtained. This means that patients with anxiety disorders have a 2.385 times longer length of stay than patients without anxiety. Patients with anxiety at the time of admission to the hospital also have a longer length of stay than patients who are not anxious. The results of this study confirmed the theory presented by Ward and Hamsley (1981) based on the research conducted, namely that of the 38 research subjects, the research subjects who were treated longer had more severe anxiety as well. Anxiety disorders that are not treated can reduce the quality of life of patients which then exacerbate the patient's illness, characterized by repeated hospital admissions, increased incidence of ischemic patients, and mortality (Januzzi et al., 2000). Another study by the STRADA Indonesia Institute of Health Sciences in 2021 stated that the anxiety experienced by patients increases pain intensity and extends the length of stay. Research examining the relationship between anxiety levels and length of stay in caesarean section patients using the Visual Analog Scale for Anxiety (VAS-A) and State-Trait Anxiety Inventory (STAI) shows that anxiety levels affect length of stay. In addition, patients who are treated longer experience more severe levels of anxiety (Schaal et al., 2020).

5. Conclusion

All research subjects or as many as 100% of research subjects experienced anxiety. The level of anxiety experienced by research subjects varied into mild anxiety, moderate anxiety, and severe anxiety. Most research subjects experience severe anxiety. The level of anxiety was higher in the non-geriatric, surgical, invasive device group, and the length of stay was less than 7 (seven) days. There were no research subjects who were on a scale of 0 or "not worried at all" and a scale of 10 or "extremely anxious".

Compliance with ethical standards

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All parties that cannot be mentioned one by one, who directly and indirectly contributed.

Disclosure of Conflict of interest

There is no conflict of interest.

Statement of ethical approval

Ethical approval was sought from the Health Research Ethics Committee of Rumah Sakit Umum Daerah Dr. Soetomo.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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