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The Relationship Between Nutritional Status And The Incidence Of Pneumonia In Adult Patients At Royal Prima RSu Medan

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ABSTRACT

Pneumonia is a common disease with a high global prevalence. Hospitalization rates for elderly pneumonia patients are five times higher than those for adult patients. Pneumonia has lasting consequences, including diminished lung function. As a result, pneumonia remains a critical public health issue in Indonesia. A person's susceptibility to illness may be affected by their nutritional state. It is easier to become sick from malnutrition-related immune system problems. The effects of malnutrition and infection on one another are two-way. People who are malnourished are more susceptible to catching pneumonia, and the latter may worsen their condition. The purpose of this research was to examine the association between patients' nutritional state and the occurrence of pneumonia at RSU Royal Prima Medan, an adult hospital. This investigation is a retrospective, analytical study. Adult patients with pneumonia who were seen at RSU Royal Prima Medan during the months of October and December 2022 made up the study population. Utilizing the Slovin algorithm for simple random sampling, we were able to collect data from 45 participants for analysis utilizing univariate and bivariate methods. The majority of patients diagnosed with pneumonia at RSU Royal Prima Medan were male, older than 40 years old, and had clinical signs of chest discomfort. At RSU Royal Prima Medan, 19 patients with pneumonia had a normal nutritional state and 26 had a bad nutritional status. Adult patients at RSU Royal Prima Medan have a p-value < 0.05 correlation between their dietary health and the occurrence of pneumonia .

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1. INTRODUCTION

Pneumonia is a serious lung disease that can strike at any time. When healthy people breathe, air flows through the trachea and into the alveoli, the small sacs that make up the lungs. Pneumonia causes difficulty breathing and decreased oxygen intake due to the accumulation of pus and fluid in the alveoli. According to the World Health Organization, pneumonia kills more children than all other infectious diseases combined.

Pneumonia has a high global prevalence, estimated to be between 15 and 20 percent. Pneumonia attacks the elderly with a frequency of 25-44 per 1000 people every year. Elderly people are more likely to get pneumonia than other age groups (81.2%). The hospitalization rate for elderly pneumonia patients is five times higher than for adult patients. Among the main causes of death in the elderly, pneumonia is ranked #5 (Indonesian Lung Doctors Association, 2020).

According to the World Health Organization, acute respiratory infections including pneumonia and influenza are the leading causes of death worldwide from infectious diseases. In the United States, pneumonia has a mortality rate of 169.7 per 100,000 population, making it the fourth cause of death in adults. Brunei is ranked ninth in terms of deaths from pneumonia, while Malaysia is seventh, Singapore is third, Thailand is sixth and Vietnam is third. Around 450 million people per year are diagnosed with pneumonia (WHO, 2022). This number is much higher in underdeveloped countries.

Patients with pneumonia must be very careful in receiving adequate treatment because this condition has a high crude mortality rate, namely around 7.6% (Indonesian Lung Doctors Association, 2020). people who have weak immune systems and many medical conditions. Decreased lung function is a long-term effect of pneumonia that may occur in adulthood. As a result, the prevalence of pneumonia remains high (Elly, 2019). Malnutrition, indoor air pollution (from relatives who smoke, mosquito coils, and wood-burning stoves), high overcrowding in the home, zinc deficiency, and previous experience in raising children, comorbidities, baby rooms, humidity, cold air, vitamin deficiencies. Diet, birth order, and low birth weight (LBW) are risk factors for pneumonia.

A person's susceptibility to disease may be influenced by their nutritional condition. It's easier to get sick because of immune system problems related to malnutrition. The impact of malnutrition and infection on each other is bidirectional. This is a vicious circle: hunger makes them more susceptible to pneumonia, and pneumonia makes them even more malnourished (Elsa, 2022) . The number of cases of malnutrition in developing countries is quite high. If the problem of malnutrition is not resolved, it can disrupt the country's economic development (Winiarti et al., 2018) . Toddlers who are well-nourished have a stronger immune system and are less likely to contract infectious diseases such as pneumonia (Wahyuini, 2019) because their bodies are better able to fight foreign objects. Those with poor nutritional status and weak immune systems are more likely to contract infectious diseases (Wahyuini, 2019) .

Although the relationship between malnutrition and pneumonia has not been widely studied in Indonesia, malnutrition, including protein energy malnutrition and micronutrient deficiencies, is recognized as one of the most important risk factors for pneumonia throughout the world (Winiati et al., 2018) . Infectious disorders such as pneumonia occur more frequently when malnutrition weakens the body's defenses against microbes and mechanical threats. Viruses and bacteria cannot reproduce without the proteins found in living tissue, as a result this is what happens (Nurul, 2022) . People with inadequate nutrition and immunity are at risk of contracting infectious diseases; however, even "normal" conditions can be life-threatening if the patient's nutritional condition worsens. Meanwhile, patients with healthy nutritional conditions have a stronger immune system so they are not susceptible to disease. This is especially true for pneumonia. Patients who receive good nutrition will be better able to ward off the dangers of infection (Elly, 2019) . Researchers at RSU Royal Prima Medan are interested in studying the relationship between patient nutritional status and the incidence of pneumonia based on the information above and previous research findings.

2. METHOD

This study uses a retrospective , analytical and observational approach in its methods. Studies based on analytical observations attempt to characterize a condition or event without involving the person who is the research subject (patient). The research was conducted at RSU Royal Prima Medan which is located at Jl. Father No. 68A, Sei Putih Tengah, Kec. Medan Petisah, Medan City, North Sumatra 20118. After the proposal presentation in December 2022, the research phase will continue until January 2023, which will then continue with data collection and seminars regarding the results . The study population is medical data from adults diagnosed with pneumonia and treated at RSU Royal Prima Medan between October and December 2022. Sugiyono (2019) believes that the sample reflects the demographics and composition of the population as a whole. If the number is less than 100 people, Arikunto (2018) says it is okay to take them all; if it's more than 100, you can take 10-15% or 20-25%.

This study uses a non-probabilistic random sampling strategy. Sugiyono (2019) believes that selecting sample members from the population randomly without paying attention to pre-existing norms or similarities is the essence of the basic random sampling approach. If a population is assumed to have similar characteristics, then this technique is applied. In this study, the sample size was calculated based on the following factors:

a. Adult patients aged 17 years and over
b. It was stated that he was suffering from pneumonia
c. Recorded in the hospital medical record

The Slovin formula was used to determine the sample size for this investigation:

$$n = \frac{N}{1 + N^2}$$

n = Number of samples searched
N= Number of population
E = Tolerated margin of error 10%
So the number of research samples is:

$$n = \frac{83}{1 + 83\ (0{,}1^2)}$$

$$n = \frac{83}{1 + 83\ (0{,}01)}$$

$$n = \frac{83}{1 + 0{,}83}$$

$$n = \frac{83}{1{,}83} = 45.35$$

Slovin's formula yields a minimum sample size of 45.35; this is rounded up to 45 samples. Research instruments are tools for measuring natural and social phenomena as defined by Sugiyono (2019). Medical records of adults diagnosed with pneumonia and treated at RSU Royal Prima Medan were used as data in this study. Apart from medical records as the main data source for this study, researchers also utilized research documentation tools (Medical Record Status), writing tools, and laptops to speed up the process of writing up their findings. This research data consists of primary data and secondary data :

a. Primary data
   Medical records of those diagnosed with pneumonia served as the primary source of information for this study.
b. Secondary Data
   Data from secondary sources, such as library research, documentation, books, magazines, newspapers, written archives, and so on, are used to complement primary data. Data collectors rely on secondary sources when primary sources, such as interviews or notes, are unavailable or unreliable. Researchers will find it easier to collect data and analyze findings thanks to this secondary data source, which will ultimately refine findings and produce research with a high level of validity.

After data collection is complete, the next step in the research process is data processing. The steps taken in data processing are as follows:

a. Editing
   Correcting (editing) data collected or gathered from a patient's medical record is the first step; If the data or information is insufficient and cannot be used as a sample, then the notes are withdrawn from consideration (Notoatmodjo, 2018) .
b. Coding
   Data that was previously written in the form of words or phrases is now represented numerically or graphically. The medical record number and question number are listed on a code sheet or card, which is a column-shaped device for manual data entry (Notoatmodjo, 2018) .
c. Data Entry (Entering Data)
   Code (numbers or letters) for each information in the medical record before entering it into the computer (Notoatmodjo, 2018) .
d. Tabulating
   Once the data has been cleaned and coded, it can be tabulated to provide a visual representation of the frequency distribution of the data (Notoatmodjo, 2018) .

Data analysis

Univariate and bivariate analysis in SPSS Version 25 was used to analyze the data in this study. The data is then analyzed by determining the percentage of each feature depending on the selected factors (Sugiyono, 2019) .

Univariate Analysis

The purpose of univariate analysis is to explain or characterize the nature of a research variable. Univariate analysis takes several forms depending on the nature of the data. When conducting research, univariate analysis often only produces frequency and percentage distributions (Notoatmodjo, 2018).

Bivariate Analysis

Bivariate analysis involves looking at the relationship between two variables (Notoatmodjo, 2018). This study was conducted to find out how much weight each independent variable has on the results. Bivariate analysis included cross tabulation and chi-square test to determine statistical significance. Making choices using bivariate analysis requires.

1. If p value ≤ α (0.05) H0 is rejected, which means there is an influence between the independent variable and the dependent variable.
2. If p value > α (0.05) H0 is accepted which means there is no influence between the independent variable and the dependent variable .

3. RESULTS AND DISCUSSION

Distribution of Patient Characteristics Based on Gender

Table 1 Frequency Distribution of Patient Characteristics Based on Gender

Gender	n	%
Man	25	55.6
Woman	20	44.4
Total	45	100

Source: Primary data processed (2023)

Table 1 explains the results regarding the frequency distribution of patient characteristics based on gender. Pneumonia patients at RSU Royal Prima Medan were 25 male patients with a percentage of 55.6% and 20 female patients with a percentage of 44.4% of the total sample in the following study were 45 patients. From these results it can be seen that the majority of patients are male.

Distribution of Patient Characteristics Based on Age

Table 2 Frequency Distribution of Patient Characteristics Based on Age

Age	n	%
35-40 Years	18	40
>40 Years	27	60
Total	45	100

Source: Primary data processed (2023)

Table 2 explains the results regarding the frequency distribution of patient characteristics based on age. In this study, there were 18 patients with pneumonia at RSU Royal Prima Medan aged 35-40 years, a percentage of 40% and patients aged >40 years, there were 27 patients with a percentage of 60% of the total sample in the following study, there were 45 patients. From these results it can be seen that the majority of patients are >40 years old.

Distribution of Patient Characteristics Based on Clinical Symptoms

Table 3 Frequency Distribution of Patient Characteristics Based on Clinical Symptoms

Clinical Symptoms	n	%
Fever	14	31.1
Shivering	9	20
Chest pain	22	48.9
Total	45	100

Source: Primary data processed (2023)

Table 3 explains the results regarding the frequency distribution of characteristics of pneumonia patients based on clinical symptoms. In this study, there were 14 patients with pneumonia at RSU

Royal Prima Medan with clinical symptoms of fever, a percentage of 31.1%, there were 9 patients with clinical symptoms of chills, a percentage of 20%, and there were 22 patients with clinical symptoms of chest pain. a percentage of 48.9% of the total sample in the following study was 45 patients. From these results it can be seen that the majority of pneumonia patients at RSU Royal Prima Medan experienced clinical symptoms of chest pain.

Univariate Analysis Results

Clinical Classification of Pneumonia Patients

Table 4 Frequency Distribution of Patients Based on Clinical Classification of Pneumonia Sufferers

Clinical Classification of Pneumonia Patients	n	%
Pneumonia	20	44.4
Severe Pneumonia	25	55.6
Total	45	100

Source: Primary data processed (2023)

Table 4 explains the results regarding the frequency distribution of patients based on the clinical classification of pneumonia sufferers. In this study, there were 20 patients with pneumonia at RSU Royal Prima Medan with a clinical classification of pneumonia sufferers, a percentage of 44.4%, and pneumonia patients at RSU Royal Prima Medan with a clinical classification of severe pneumonia sufferers, there were 25 patients with a percentage of 55.6%. . From these results it can be seen that the majority of pneumonia patients at RSU Royal Prima Medan experienced severe pneumonia.

Nutritional status

Table 5 Frequency Distribution of Patients Based on Nutritional Status of Pneumonia Sufferers

Nutritional status	n	%
Normal Nutrition	19	42.2
Malnutrition	26	57.8
Total	45	100

Source: Primary data processed (2023)

Table 5 explains the results regarding the frequency distribution of patients based on the nutritional status of pneumonia sufferers. In this study, there were 19 patients with pneumonia at RSU Royal Prima Medan with normal nutritional status, a percentage of 42.2%, and pneumonia patients at RSU Royal Prima Medan with poor nutritional status, there were 26 patients with a percentage of 57.8%. From these results it can be seen that the majority of pneumonia patients at RSU Royal Prima Medan are malnourished.

Bivariate Analysis Results

Relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan

The results of bivariate analysis with chi square of the relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan can be seen in the following table:

Table 6 Relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan

Nutritional status	Classification of Pneumonia Sufferers				Total		Information
	Pneumonia		Severe Pneumonia				
	n	%	n	%	n	%	
Normal Nutrition	14	31.1	5	11.1	19	42.2	0.001
Malnutrition	6	13.3	20	44.4	26	57.8	
Total	20	44.4	25	55.6	45	100	

Source: Primary data processed in 2023

Table 6 explains the results of research on the relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan. From the results of the cross table it can be seen that in pneumonia patients with normal nutritional status who suffered from

pneumonia there were 14 patients with a percentage of 31.1% and those who suffered There were 5 patients with severe pneumonia, a percentage of 11.1%. There were 6 patients with pneumonia with poor nutritional status who suffered from pneumonia with a percentage of 13.2% and those who suffered from severe pneumonia, there were 20 patients with a percentage of 44.4% . The results of the chi square test showed a p-value of 0.001 < 0.05, which means there is a relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan.

Discussion

Gender

Based on the research results, it is indicated that there are 25 patients with pneumonia at RSU Royal Prima Medan who are male with a percentage of 55.6% and there are 20 patients who are female with a percentage of 44.4% of the total sample in the following study. there were 45 patients. From these results it can be seen that the majority of patients affected by pneumonia are male.

Based on the findings of this study, men are more likely to suffer from pneumonia. This is in line with the findings of a study conducted by Efliana (2016) at RSUD. Pneumonia sufferers in 2015 were divided equally between men and women (53%) in this study totaling 97 patients who were treated at the Inpatient Installation of Abdul Wahab Sjahranie Hospital, Samarinda. This is because the function of the respiratory system in men and women is different. Women's lung organs have better air flow conductivity and lower air flow resistance, resulting in easier air circulation through the respiratory cavity and protecting the lungs from pathogenic diseases. In addition, the Th1 immune response is stronger in women than in men, indicating that women have a stronger immune system overall. The environment may also have a role in forming other elements. Men constitute the majority of smokers. Long-term exposure to secondhand smoke can cause lung disease, even in healthy people. As a result, bronchitis and pneumonia can occur (Laviesta, 2020).

Men are 0.45 times more likely to get pneumonia than women. In line with the findings of the Riskesdas study (2010) conducted by the Ministry of Health, it was found that more men suffer from this disease, most likely due to the greater presence of pathogenic substances such as cigarettes and the like. When ingested by men, these drugs lower their immune system, thereby making them more susceptible to disease. The risk of pneumonia is increased in men, according to the ARI Disease Management guidelines. Because men tend to be more active than women, this poses a security risk. When a person's immune system is weakened, diseases such as community-acquired pneumonia may attack more easily. WHO (2020) explains that this is because men are more likely to leave the house to work, thereby exposing them to air pollution, while women are more likely to stay at home as housewives, thus protecting them from this exposure.

Age

The research found that of the entire sample, 18 patients (40%) aged between 35 and 40 years at RSU Royal Prima Medan were diagnosed with pneumonia, while 27 patients (60%) were aged over 40 years. Need help. The majority of pneumonia sufferers were found to be over 40 years old, as shown by these findings.

Patients aged 40 years and over were found to have the greatest prevalence of pneumonia in this study. This is in line with the findings of a study conducted by Negoro (2021) at the Brebes Community Health Center. Of the total sample of 80 respondents, 30 people were adults aged 36–45 years who were diagnosed with pneumonia. At the Brebes Community Health Center between December 2020 and February 2021, the elderly constituted the second highest proportion of pneumonia patients (22 patients, or 28 percent of all patients), followed by the early elderly (46 to 55 patients, or 19 percent of all patients), and the elderly (> 65 patients, or 16 percent of all patients).

As the global population ages, the prevalence of pneumonia among the elderly will increase. Likewise, pneumonia is a major cause of death and disability. Pneumonia is a leading cause of emergency room visits and hospitalizations among seniors. Reduced organ function due to aging, frequent comorbidities, diet, social and psychological variables, and so on all contribute to the increasing prevalence in the elderly. and dynamic ecosystem. The aging process causes a decline in the function of the body's organs, especially the respiratory system. This decrease is most visible in the cough reflex, the ability of respiratory tract cilia to clean dirt, chest wall muscle strength, as well as the body's natural and acquired immune response (Rai and Artana, 2006). Elderly dysphagia

sufferers often experience aspiration, which can lead to aspiration pneumonia. Aspiration occurs when oropharyngeal secretions or stomach contents enter the larynx and lower respiratory system. Patients with dysphagia are three times more likely to develop pneumonia than the general population (Hebert et al., 2016).

Coughing up phlegm is a common symptom of pneumonia in the elderly. Most people over 65 years of age have difficulty fighting infections such as pneumonia because of their weak immune systems. It is rare for people diagnosed with cystic fibrosis to live to old age. In contrast, patients with bronchiectasis tend to live longer than the general population. Recurrent endobronchial obstruction is a potential complication in patients with recurrent pneumonia originating from the same anatomic location. If there is no clear cause for recurrent post-obstructive pneumonia attacks, then the presence of bronchogenic cancer must be considered (Ida, 2021).

Clinical Symptoms

Based on the results of the research, it indicated that there were 14 patients with pneumonia at RSU Royal Prima Medan with clinical symptoms of fever, a percentage of 31.1%, patients with clinical symptoms of chills, there were 9 patients with a percentage of 20% and there were 22 patients with clinical symptoms of chest pain. patients constituted a percentage of 48.9% of the total sample in the following study, there were 45 patients. From these results it can be seen that the majority of pneumonia patients at RSU Royal Prima Medan experienced clinical symptoms of chest pain.

This is in line with research by Biscevic et al (2013), this study involved 100 inpatients with lower respiratory tract infections at the CCUS Infectious Disease Clinic. According to Biscevic et al (2013), the main clinical symptoms of pneumonia are fever and cough, with or without phlegm, accompanied by stabbing pain in the chest and shortness of breath. The clinical picture of viral pneumonia ranges from mild pneumonia with fever, cough, chills and shortness of breath to severe pneumonia with sepsis and respiratory distress and chest pain. The severity of symptoms is related to the individual's local and systemic immune response. A non-productive cough accompanied by dyspnea and pleuritic chest pain is the most common symptom of viral pneumonia. Fever, chills, fatigue, malaise, pleuritic chest pain, and anorexia are frequently reported. In severe cases, physical examination signs may also include tachypnea, increased respiratory rate, and abnormally loud breath sounds. Hypoxemia is generally reported due to impaired alveolar gas exchange (Dandachi, 2018).

Nutritional status

Based on the research results, it indicated that there were 19 patients with pneumonia at RSU Royal Prima Medan with normal nutritional status, a percentage of 42.2%, and pneumonia patients at RSU Royal Prima Medan with poor nutritional status, there were 26 patients with a percentage of 57.8%. From these results it can be seen that the majority of pneumonia patients at RSU Royal Prima Medan are malnourished.

This is in line with Rahmawati's (2016) research in the KIA room at the Ambacang Padang Community Health Center. The research results showed that the majority (70.0%) of respondents were diagnosed with pneumonia and almost half (43.3%) of respondents had poor nutritional status. According to Rahmawati (2016), if the nutritional condition is not good (deficient/bad), the body's immune reaction will decrease, which means the body's ability to defend itself against infection attacks will also decrease.

The researchers speculate that this is because the majority of respondents came from low-income families, which may have a negative impact on a person's diet. If the family income is large, then perhaps the family's purchasing power is also high. Patients with low nutrition will have a weak immune system and are more likely to get pneumonia than patients with good nutrition.

Malnutrition is a direct result of the inability to eat caused by an infectious disease. Babies who are malnourished are more likely to get pneumonia. Pneumonia patients in this study were also found to have a healthy body mass index. Scientists assume this occurs when people living in a residence regularly smoke contribute to an atmosphere conducive to the spread of pneumonia. Apart from that, pneumonia patients are also expected to create a safe, clean and pleasant atmosphere by developing the habit of opening windows, avoiding smoking and maintaining a safe distance. A child's nutritional status is determined by their weight and height in accordance with their age. The balance between food needs and intake is also considered an indicator of good nutrition (Berta, 2021).

Relationship between nutritional status and the incidence of pneumonia in adult patients at RSU Royal Prima Medan

The aim of this study was to determine the relationship between the nutritional status of adult patients and the incidence of pneumonia at RSU Royal Prima Medan. The results of the study indicated that 44.4% of patients treated at RSU Royal Prima Medan were clinically classified as suffering from pneumonia, with 20 patients experiencing this condition. , and there were a total of 25 patients (55.6%) at RSU Royal Prima Medan who were diagnosed with severe pneumonia. The proportion of pneumonia sufferers with normal nutritional status at RSU Royal Prima Medan was 42.2% (19 out of 57.8), while the percentage of pneumonia sufferers with poor nutritional condition was 26 out of 57.8% (19 out of 57).

From the results of the cross table it can be seen that among pneumonia patients with normal nutritional status there were 14 patients suffering from pneumonia with a percentage of 31.1% and those suffering from severe pneumonia there were 5 patients with a percentage of 11.1%. There were 6 patients with pneumonia with poor nutritional status who suffered from pneumonia with a percentage of 13.2% and those who suffered from severe pneumonia, there were 20 patients with a percentage of 44.4%.

The results of the chi-square test indicate a correlation between the patient's nutritional status and the incidence of pneumonia at RSU Royal Prima Medan; p value was 0.001 ± 0.05. The findings of this study corroborate the findings of Chen et al. (2021) who found a relationship between the nutritional deficiency index and the prevalence of pneumonia. In the elderly, the risk of pneumonia increases significantly when nutritional status is poor. Older age and comorbidities increase the likelihood of developing pneumonia and worsen the prognosis. Therefore, comorbidities must be managed properly in elderly people with pneumonia.

Malnutrition status is a poor health condition that primarily reflects a lack of nutritional supply to meet the body's physical needs. With increasing age, associated psychological and physiological changes, such as comorbidities, loss of appetite, poor oral health, loss of the ability to eat independently, cognitive impairment, decline in organ function and loss of function, lead to insufficient food intake, as well as impaired absorption and metabolism in elderly. Recent research confirms that individuals with low nutritional status are more likely to experience an increased incidence of pneumonia of any severity, whereas adults with a high nutritional status are more likely to experience an increased incidence of pneumonia. This study also revealed that residents with low nutritional status have a greater prevalence of pneumonia compared to residents with good nutritional status, and adults with poor nutritional status have a higher prevalence of pneumonia than residents with good nutritional status.

Pneumonia is an infectious disease that is transmitted through the air, so it has the potential to pose a danger to global health that must be taken seriously. Elderly people (aged 65 years and over) have a higher risk of developing CAPD. Community-acquired pneumonia causes severe illness and even death in elderly people. Clients are encouraged to exercise frequently, eat well, not smoke and stay healthy as part of the campaign. Apart from that, there was also outreach regarding the meaning of pneumonia, causes of pneumonia, symptoms of pneumonia, and complications of pneumonia (Rizka, 2020).

4. CONCLUSION

There were 25 male patients (55.6% of the total sample) who suffered from pneumonia at RSU Royal Prima Medan. Patients aged 40 years and over are the largest demographic of pneumonia patients at RSU Royal Prima Medan (27 or 60% of the total sample). At RSU Royal Prima Medan, there were 22 patients with clinical symptoms of chest discomfort which represented 48.9% of the total sample and was the largest group of pneumonia patients based on clinical symptoms. At RSU Royal Prima Medan there were 19 pneumonia patients with normal nutritional status and 26 patients with poor nutritional status. Adult patients at RSU Royal Prima Medan had a p-value < 0.05 between healthy eating patterns and the incidence of pneumonia.

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