

Difference in length of hospitalization day of Covid-19 patients with comorbid and no comorbid history in central Sulawesi



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Abstract Length of hospital stay is one of the elements or aspects of hospital care and service that can be assessed or measured. When someone is hospitalized, what is expected is that there will be a change in the degree of health. This study aims to determine the difference in the length of hospitalization for Covid-19 patients with a history of comorbid and without a history of comorbidities in Central Sulawesi. The type of research used is a cross-sectional analytic survey. The results showed that the most length of stay was not long, with a proportion of 52.1%, and the most comorbid history was having a comorbid with a proportion of 69.8%. The length of hospitalization was not long, with a proportion of 52.1%, and the most comorbid history was having a comorbid with a proportion of 69.8%. Furthermore, the Wilcoxon statistical test showed a difference in the average length of stay for Covid-19 patients with a history of comorbidities and without comorbidities with a value of 0.000. There is a difference in the average frequency of days of hospitalization for Covid-19 patients.

Keywords: hospitalization, Covid-19 patients, comorbid history

1. Introduction

Covid-19 cases are a disease caused by a new type of virus that was discovered in 2019 and has not been identified as attacking humans before (Zulva 2020). The covid-19 case is an infectious disease caused by acute respiratory syndrome coronavirus 2 (SARS-CoV2) set (Setiawan 2020). WHO designated the virus as a pandemic on March 11, 2020, because the transmission of this virus is very fast and massive (Mona 2020). SARS-CoV-2 started from a local seafood market in Wuhan that likely originated in bats, as 96% of the genome is similar to the bat coronavirus and the infection becomes difficult to control or prevent (Fang 2020; Riski 2021).

The World Health Organization (WHO) declared a global emergency against the coronavirus because it has already been distributed to many countries. In Indonesia, the first case of Covid-19 was confirmed on March 2, 2020, and on April 10, 2020, the distribution spread across 34 provinces in Indonesia. As of October 30, 2020, Covid-19 cases in Indonesia have reached 406,945 cases, with the number of recoveries reaching 334,295 cases and the number of patients who died as many as 13,782 cases (Ministry of Health Indonesia 2020b).

The prevalence of Covid-19 cases in Central Sulawesi Province on April 7, 2021, the number of cumulative positive confirmed cases was 11,424, with the highest case being in the city of Palu, with as many as 2,825. There were 10,270 recovered cases and 300 deaths with a CFR of 2.64% (Public Health Office 2021). The prevalence of Covid-19 cases at Undata Palu Hospital, both suspect and confirmed positive for the period of April 2020 to March 2021 was 561 cases.

The transmission rate of the Coronavirus is still increasing every day. Currently, more than 8 million people worldwide are infected with Covid-19. Although hundreds of thousands of lives have been lost due to the disease, some still have managed to recover from the Coronavirus, depending on how severe the infection is. Some people will recover quickly, but the symptoms can get worse in some other groups. Age, gender, and history or condition of health problems can be factors that determine the duration of recovery from the Coronavirus (Docherty 2020).

Indications of Covid-19 patients undergoing hospitalization are difficult to equate as they depend on the prevalence of community testing and admission criteria, which vary by country. The more treatment needed, the longer the recovery period. However, it is estimated that 1 in 5-10 adults have a disease of severity and have sufficient criteria for hospitalization. According to the WHO case definition, most patients are treated with severe acute respiratory infections or severe acute respiratory



syndrome. Criteria for intensive care also vary by country. Factors of old age and comorbid diseases are associated with an increase in the mortality of covid-19 cases (Docherty 2020).

Patients with comorbid disease with severe treatment conditions directly enter the ICU room with negative pressure. If the patient comes in moderate or mild condition, it will be treated in a standard inpatient isolation room. When the patient with comorbid is not controlled, then the patient is treated with special monitoring. During monitoring, we must know the clinical course of his Covid-19, which is also called virulence from the incubation period. The hospital will provide the best service by the standards set by the Ministry of Health. The patient goes through several phases before finally recovering from the critical period to recovery. The patient was cured after a PCR test 2 times, and the results were negative. Duration of treatment from admission, until declared cured, took two weeks for patients without comorbidities and three weeks for patients with comorbidities. The length of time patients are treated and recovered varies depending on the condition of the Covid-19 patient.

Patients with observed comorbidities can have more than one comorbidity. Patients who have comorbidities have an average age of > 45 years. From the observed data of Covid-19 patients, 66 (26.08%) patients died. The two comorbid diseases that most patients have are diabetes and heart disease. Patients with comorbid diabetes and heart disease are risk factors for covid-19 death because patients with comorbid diabetes have a 4,384 times greater risk of dying from Covid-19 than patients without comorbid diabetes, with a value of $p < 0.000$ and patients with cardiac comorbidities have a 4,319 times greater risk of dying from Covid-19 than patients without Cardiac comorbidities, with $p < 0.009$. Meanwhile, comorbid hypertension, TB, COPD, CKD, CVA, Pregnancy, Asthma, and HIV / AIDS have not risked factors for COVID-19 death because the value of $p > 0.05$ (Satria et al 2020).

The results of the study (Mona 2020) showed that the average age of patients was 51 years old, with a minimum age of 20 years. Patients aged > 64 years were 38 (15%), and those aged 19-65 years were 215 (85%). The sexes observed males 126 (49.8%) and females 127 (50.2%). From the demographic data above, the comorbid risk factors observed are diabetes, hypertension, TB, Chronic Obstructive Pulmonary Disease (COPD), heart, pregnancy, asthma, and HIV / AIDS.

The relationship between comorbidities and the duration of treatment for Covid-19 patients is important to know so that the prognosis of patients with comorbidities can be predicted so that Covid-19 patients with comorbidities can get more optimal special health services, become a reference for hospitals to know the duration of treatment for Covid-19 patients and estimate estimated costs during the treatment of Covid-19 patients.

Therefore, this study aims to determine the difference in the length of hospitalization days between Covid-19 patients with a history of Comorbidities and without comorbidities in Central Sulawesi.

2. Methodology

The type of research used is a Cross-Sectional analytic survey looking at the difference in the length of day hospitalization of Covid-19 patients with a history of comorbidities and without a history of comorbidities at Undata Palu Hospital and Anutaloko Parigi Hospital. The data of this study is sourced from primary and secondary data, which go through several stages of data processing, including 1) Editing, re-checking the data that has been collected, whether there are errors or not, 2) Coding, p the number of codes or weights on the answers that are categories, 3) Tabulation, compilation and data calculations based on the variables studied, 4) Cleaning, cleaning the data by looking at the variables used whether the data is correct or not, and 5) Describing, m describe or describe the data that has been collected.

The data analysis used in this study through analisa bivariate aims to analyze the difference in the length of stay of Covid-19 patients with a history of Comorbidities and without a history of comorbidities in Central Sulawesi using statistical tests. First, use the normality test using the Kolmogorov-Smirnov test with a significant 0.05. The results show the data variable with a p-value of < 0.05, which means that the data from this study is not normally distributed, so the test that can be used in this study is a non-parametric test, namely the Wilcoxon test. The interpretation of bivariate analysis is 1) p-value in the Sig column. (2-tailed) < alpha (0.05) means H_0 is rejected or hypothesized is accepted, which means there is a difference in the length of stay of Covid-19 patients with a history of Comorbidities and without a history of comorbidities in Central Sulawesi, 2) If p-value in the Sig column. (2-tailed) > alpha (0.05) means H_0 failed to be rejected, and it can be inferred there are no differences in the length of stay of Covid-19 patients with a history of comorbidities and without a history of comorbidities in Central Sulawesi. As for the presentation of data in this study, the results of the study, the data is presented in the form of tables and manuscripts.

3. Results

3.1. Characteristics of Respondents

The age distribution of respondents showed that respondents who had aged <20 years were four people (4.2%), aged 21-30 years were 12 people (12.5%), aged 31-40 years were 12 people (12.5%), aged 41-50 years were 18 people (18.8%), aged 51-60 years were 28 people (29.2%) and those who had an age of >60 years were 22 people (22.9%) (Table 1).

Table 1 Age distribution of inpatient covid-19 patients in hospitals in Central Sulawesi Province.

Age	F	%
<20 Years	4	04.48
21-30 Years	12	12.00
31-40 Years	12	12.00
41-50 Years	18	19.12
51-60 Years	28	29.02
> 60 Years	22	22.09
Total	96	100

3.2. Respondents Based on Diagnosis

The distribution of diagnoses showed that those who had diagnoses of ACS, ADHF, AP, ASTHMA, Hypoglycemia, HT Gravidarum, NSTEMI, and Susp Tumors totaled one person each (1%), who had BP, Bronchitis, Dyspepsia, HT grade II and Pulmonary TB diagnoses of 2 people each (2.1%), who had a diagnosis of ARDs and respiratory failure totaled three people each (3.1%), who had a diagnosis of type 2 DM, HHD, Hypertension each numbered four people (4.2%), those who had a diagnosis of CKD amounted to 7 people (7.3%) who had a diagnosis of pneumonia totaling 24 people (25%) and those who did not have comorbidities amounted to 29 people (30.2%) (Table 2).

Table 2 Distribution of diagnosis of covid-19 patients with comorbid and non-comorbid in inpatient Central Sulawesi Provincial Hospital.

Diagnosis	F	%
ACS	1	1.0
ADHF	1	1.0
AP	1	1.0
ARDS	3	3.1
ASTHMA	1	1.0
BP	2	2.1
BRONCHITIS	2	2.1
CKD	7	7.3
DM TIPE II	4	4.2
DYSPEPSIA	2	2.1
Respiratory Failure	3	3.1
HHD	4	4.2
Hypertension	4	4.2
Hypoglycemia	1	1.0
HT Gr II	2	2.1
HT Gravidarum	1	1.0
NSTEMI	1	1.0
Pneumonia	24	25.0
Susp Tumor	1	1.0
TB Published	2	2.0
No comorbidities	29	30.02
Total	96	100

3.3. Normality Test

Before the data is obtained, a normality test is carried out first. The normality test used in the data was the Kolmogorov-Smirnov test with a significant 0.05. A variable is declared normally distributed when $P > 0.05$. The following is the normality of the data used in this study (Table 3):

Table 3 Normality test.

	Comorbid	df	Kolmogorov-Smirnova
Long-Treat	Comorbid	67	0.000
	Non Comorbid	29	0.001

Table 3 shows the data variable with a p -value of < 0.05 , which means that the data from this study is not normally distributed, so the test that can be used in this study is a *non-parametric* test, namely *the Wilcoxon test*.

3.4. Univariate Analysis

Univariate analysis was carried out in this study to see the frequency distribution of each variable, consisting of variables of the length of days of care for Covid-19 patients with a history of comorbidities and without comorbidities in Central Sulawesi.



I am using the Wilcoxon test. To analyze the ion of the variance of the technique used is to identify the frequency, presentation (%), mean (average a t a), and deviation (SD).

3.5. Distribution by comorbidity

In Table 4, it can be seen that the respondents who had comorbidities amounted to 67 people (69.8%) and did not have comorbidities amounted to 29 people (30.2%).

Table 4 Distribution of Conid-19 Patients with Comorbid Diseases in Central Sulawesi Province.

Comorbid	F	%
Comorbid	67	69.8
No Comorbid	29	30.2
Total	96	100.0

3.6. Bivariate Analysis

Table 5 shows that: 1) Negative Rank, the difference between the length of treatment days for comorbid and without comorbid is 0, both in N Mean Rank and Sum Rank values. A value of 0 indicates no decrease between comorbid and non-comorbid; 2) Posted Rank or the difference between the length of treatment for comorbid and without comorbid with Mean Rank or average increase is 47.00 While the sum of Rank is 4371.00; 3) Ties is the similarity of comorbid values and without comorbidities. It can be seen that the Ties value from the above results is three, meaning there is the same value between comorbid and no comorbid; 4) Based on Asymp Sig, it can be seen that the p-value is 0.000 < 0.05, so the hypothesis is accepted, which means that there is a difference in the length of hospitalization of Covid-19 patients with a history of comorbidities and without comorbidities in the Central Sulawesi region.

Table 5 Differences in the Duration of Covid-19 Treatment with a History of Comorbid and Non-Comorbid in Central Sulawesi Provincial Hospitals.

Uji Wilcoxon	N	Mean Rank	SUM of Rank	Asymp Sign
Length of Hospitalization	Negative Ranks	0	0	0
	Positive Ranks	93	47.00	4371.00
	Ties	3		
	Total	96		

4. Discussion

The results of univariate studies showed that the highest length of hospitalization was not long, with a proportion of 52.1%, and the most comorbid history had comorbidities, with a proportion of 69.8%. The results of Wilcoxon statistical tests show that bahwa there is a difference in the average frequency of length of days of treatment of Covid-19 patients with a history of comorbidities and without comorbidities with a value of p Value 0.000.

According to the researcher's assumption that the length of hospitalization of Covid-19 patients with a history of comorbidities and without comorbidities is very influential, this is because respondents who have comorbidities will have a longer stay period compared to those who do not have comorbidities and vice versa patients who do not have a history of comorbidities than the length of hospitalization will be shorter. However, some respondents have a history of comorbidities, but the length of hospitalization is short. This is because respondents with comorbidities have a higher mortality rate than those without comorbidities. This usually causes the short hospitalization of patients with comorbidities. Statistical tests prove a difference in the length of hospitalization of Covid-19 patients with a history of comorbidities and without comorbidities (Ministry of Health Indonesia 2020a).

Patients with comorbidities are known to have a higher mortality rate than ordinary patients. Exposure to Covid-19 in comorbid individuals, for example, in diabetics, can affect the lungs, heart, kidneys, and liver. According to research, the most common comorbidities in Covid-19 patients are diabetes, cardiovascular, and respiratory system diseases. Based on guidance from the World Health Organization (WHO) and the National Institutes of Health (NIH) on treating Covid-19 patients, patients must be separated, both with and without comorbidities, and in different rooms.

Covid-19 patients who have congenital (comorbid) diseases such as diabetes mellitus hypertension, heart disease, and lung disease these patients often experience severe symptoms and increased mortality (Lal 2021).

According to (Harahap and Julia, 2020), the clinical symptoms of Covid-19 experienced by 20-51% of patients reported having at least one comorbidity with hypertension (10–15%), diabetes (10–20%), and other hearts and cerebrovascular diseases (7–40%) are the most common diseases. Previous cases indicate that comorbidity is associated with 3-4 times the risk of experiencing acute respiratory distress or syndrome in patients with viral infections. Respiratory syndromes such as



coronavirus (MERS-CoV) and SARS-CoV-2 are more prone to respiratory failure and death in patients susceptible to comorbidities

According to (Tiksnadi et al 2020), research Hypertension, Diabetes Mellitus, COPD, Kidney, and Heart have the highest risk of severity of Covid-19 infection. COPD (Chronic Obstructive Pulmonary Disease) is the most important indicator for the severity of Covid-19 symptoms. In this study, COPD (Chronic Obstructive Pulmonary Disease) contributed the most to entering the ICU with a composite endpoint and invasive ventilation of Covid-19. The prevalence of COPD (Chronic Obstructive Pulmonary Disease) was found to have significant differences according to the severity of the disease (X Wang 2020).

According to Ji (2020) Some literature researchers can find that COPD (Chronic Obstructive Pulmonary Disease) correlates strongly with the severity of the disease and enters the ICU room. Thus, COPD comorbidities are related to the severity of moderate Covid-19 symptoms because chronic obstructive pulmonary disease is closely related to the risk of Covid-19 infection and requires maximum treatment for healing with several clinical symptoms such as pneumonia, cough, fever, and difficulty breathing.

Several research results have shown that the duration of treatment for Covid-19 patients varies quite a bit (Z Wang, 2020). Among them are the results of the study found that the average duration of treatment for Covid-19 patients was 13 days, while found the average duration of treatment for Covid-19 patients for 19 days. It also reported that the duration of treatment for Covid-19 patients is only six days. Covid-19 patients who were hospitalized and survived had a median duration of treatment of 6.91 days, but treatment became longer in patients over 60 years of age (Shah 2020).

Older adults, especially those on long-term treatment and all ages with medical conditions, are aware are at great risk of getting Covid-19. Elderly patients are most susceptible to Covid-19 and enter the ICU more often with a high mortality rate. This is because, in old age, there are changes in pulmonary anatomy and muscle atrophy which result in a decrease in lung function pasien Covid-19 with comorbidities or comorbidities have worse outcomes in the course of the disease than patients without comorbidities. Some literature shows that patients with a history of diseases such as diabetes mellitus (DM), obesity, hypertension, cardiovascular disease, and chronic airway diseases are strongly associated with poor outcomes such as ARDS and pneumonia or even death (Amir 2022).

Researchers can conclude from several comparative studies that comorbidities can aggravate a chronic disease and give rise to very severe and critical clinical manifestations such as respiratory failure, pneumonia, central cyanosis, and severe respiratory distress so that it requires special and intensive care and requires longer treatment compared to patients without comorbidities.

5. Conclusion

This study concluded that the highest length of hospitalization was not long, with a proportion of 52.1%, and the most comorbid history had comorbidities, with a proportion of 69.8%. From h asil Wilcoxon statistical test shows that bahwa there is a difference in the average frequency of length of days of care of Covid-19 patients with a history of comorbidities and without comorbidities with a value of p Value 0.000.

6. Suggestion

For hospitals, it is hoped that the Hospital, especially the intensive care department, will know early the comorbidities of covid patients so that the initial handling of covid patient care is more specific before entering a special isolation room so that Covid deaths in patients with comorbidities can be prevented.

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Ethical considerations

I confirm that I have obtained all consent required by the applicable law to publish any personal details or images of patients, research subjects, or other individuals used. I agree to provide Multidisciplinary Science Journal with copies of the consent or evidence that such consent has been obtained if requested. This Research has received ethical approval from Palu Ministry of Health research ethics commission with Number: 0037/KEPK-KPK/V/2022.

Conflict of Interest

The authors declare that they have no conflict of interest.

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