



Analysis of the Differences in Length of Stay of Covid-19 Patients with a History of Comorbids and Without a History of Comorbids on the Impact of Hospital Financing in Central Sulawesi Province in 2023

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 01 Nov 2023	<p><i>Case is a health problem experienced throughout the world. The increasing spread of the Covid virus in Indonesia has resulted in hospitals designated by the Ministry of Health being unable to accommodate patients infected with Covid. Analysis of the differences in treatment duration for Covid-19 patients with comorbidities and without comorbidities is important to know so that the prognosis of patients with comorbidities can be predicted, so that Covid-19 patients with comorbidities can receive more optimal special health services so that the death rate due to Covid-19 can be maximally prevented. and can reduce costs for treating Covid-19 patients. The aim of this research is to analyze the difference in length of stay for Covid-19 patients with and without a history of comorbidities in Central Sulawesi Province in 2023. This research uses a cross sectional type of research . The population in this study was 9 6 samples. The sampling technique used was Accidental Sampling, data analysis used was bivariate analysis with the Mann Whitney test. The results of the study showed that the highest length of stay was for Covid patients who underwent short-term treatment with a proportion of 88.5% and those with a history of comorbidities had the most comorbidities with a proportion of 63.5%. The results of the Mann Whitnay statistical test show that there is no difference in the average frequency of length of stay for Covid-19 patients with a history of comorbidities and without comorbidities. with the value p Value 0.512. The advice in this research is that it is hoped that the hospital, especially the Health Promotion section, will always disseminate health education about the factors that influence the length of stay and treatment of Covid-19 patients with and without comorbidities. Covid cases accompanied by comorbidities are mostly age. Furthermore, it is necessary to provide education on Covid prevention through leaflets and Covid pocket books at Posyandu for the elderly</i></p>
CC License CC-BY-NC-SA 4.0	Keywords: Length of Hospitalization, Comorbid, Without Comorbid, Covid-19 Patients

1. Introduction

Background

Case is a health problem experienced throughout the world. Data from the World Health Organization (WHO) from December 2019 to 23 July 2020 showed that 15,012,731 people had been infected with Covid-19 with 619,150 deaths. In Indonesia, 89,869 people have been infected with Covid-19 and 4,320 people have died from Covid-19. Several case reports suggest suspected transmission from asymptomatic carriers, but the exact mechanism is unknown. Cases related to transmission from asymptomatic carriers generally have a history of close contact with Covid -19 patients (Fang Y, 2020)

The World Health Organization (WHO) declared a global emergency regarding Covid-19 caused by the corona virus which has spread to various countries. The first case of Covid-19 in Indonesia was confirmed on March 2 2020 and spread to 34 provinces of Indonesia in April 2020. In October 2020, Covid-19 cases in Indonesia had reached 406,945 cases, with the number of recoveries reaching

334,295 cases and the number of patients 13,782 cases died (Ministry of Health of the Republic of Indonesia, 2020)

A significant increase in Covid-19 cases occurred from December 2020 to January 2021. Data for December 5 2020 recorded 563,680 confirmed cases with 17,478 deaths (CFR: 3.1%), with 466,178 patients recovering. The data for January 29 2021 shows 1,051,795 confirmed cases, 29,518 deaths (CFR: 2.8%), and 852,260 recovered cases (Ambirawati, 2021). The increasing spread of the Covid virus in Indonesia has resulted in hospitals designated by the Ministry of Health being unable to accommodate patients infected with Covid (Indah Prihatin, 2020).

Covid-19 cases in Central Sulawesi Province on 5 October 2022, the cumulative number of positive confirmed cases was 61,393 died 1,734 cases CFR 2.82% with the highest cases being the city of Palu with 13,609. 242 people died with a CFR 1.78%, followed by Poso Regency with 7,593 deaths, 210 cases with a CFR 2.69%, Banggai Regency with 7,564 cases. The highest mortality rate was 323 with a CFR of 4.27% (Central Sulawesi Provincial Health Office, 2022).

The number of Corona virus infections is still increasing every day. Currently more than 8 million people worldwide are infected with Covid-19. Even though hundreds of thousands of lives have been lost due to this disease, there are still people who have managed to recover from it, where the recovery time from the Corona virus will depend on how severe the infection is. Some people will recover quickly, but in other groups the symptoms can get worse. Age, gender, and history or condition of health problems can be factors that determine the time period for recovering from the Corona virus (Docherty, 2020).

Indications for Covid-19 patients undergoing hospital admission vary depending on the prevalence of community testing and admission criteria, which vary by country. The more treatment required, the longer the recovery period. However, it is estimated that 1 in 5-10 adults have disease of this severity and have sufficient criteria for hospitalization. Most patients were admitted with severe acute respiratory infection or severe acute respiratory syndrome according to the WHO case definition. There is a link between old age and comorbid diseases with increased mortality in Covid-19 cases (Docherty, 2020)

Patients with comorbid disease in serious conditions are treated immediately in the ICU. If the patient arrives in moderate or mild condition, he will be treated in a regular isolation room. When a patient with comorbid is not controlled, the patient is treated with special monitoring. During monitoring we must know the clinical course of Covid-19, which is also called the virulence of the incubation period. The hospital will provide the best service in accordance with the standards set by the Ministry of Health. The patient went through a number of phases before finally recovering from the critical period to recovery. The patient was declared cured after being carried out by *PCR tests* twice and the results were negative. The length of treatment from admission to being declared cured takes two weeks for patients without comorbid, and 3 weeks for patients with comorbid. The length of time a patient is treated and recovered varies depending on the condition of the Covid-19 patient (RI Ministry of Health, 2020)

Analysis of the differences in treatment duration for Covid-19 patients with comorbidities and without comorbidities is important to know so that the prognosis of patients with comorbidities can be predicted, so that Covid-19 patients with comorbidities can receive more optimal special health services so that the death rate due to Covid-19 can be maximally prevented. and can reduce costs for treating Covid-19 patients.

Covid-19 is a challenge for hospitals to reactivate disaster procedures as the main health service facility in treating Covid-19 patients. Hospitals need to improve the management of clinical services by preparing facilities and equipment that meet standards. The cost of treating Covid-19 patients in hospitals is relatively high, because it requires a special isolation room, in addition to other expensive treatment components such as antivirals, oxygen therapy and intensive care with ventilators to treat severe and critical patients. (Patria Jati et al., 2020)

All costs for treating Covid-19 patients are borne by the government in accordance with Minister of Health Regulation Number 59 of 2016 concerning Exemption of Fees for Certain Emerging Infectious Diseases (PIE) Patients. Funding for treated Covid-19 patients can be claimed from the Ministry of Health through the Director General of Health Services. To serve Covid-19 cases, the Ministry of Health has designated 132 Covid-19 referral hospitals through Minister of Health Decree Number HK.01.07/Menkes/ 275/2020 concerning Designation of Referral Hospitals for Handling Certain Emerging Infectious Diseases/Covid-19. (Ministry of Health of the Republic of Indonesia, 2020)

During the pandemic, almost all hospitals experienced financial problems even though all costs for treating Covid-19 patients were borne by the government. This is because most people refrain from going to the hospital because they are worried about contracting Covid-19 in health service facilities. This attitude caused a drastic reduction in patient visits to hospitals, so that the average hospital income fell by 50 percent. This makes it difficult for hospital managers to cover operational costs. (Ariyani, 2021) The burden on hospitals treating Covid-19 patients is getting higher due to delays in paying Covid-19 claims

The Indonesian Private Hospital Association (ARSSI) noted that 40 to 60 percent of total claims for health services for Covid-19 patients in private health facilities have not been paid because the ministry's budget has not been disbursed. This causes disruption to *the cash flow* of private hospitals (ARSSI, 2021). The reality of falling revenues, high operational costs and late claims payments ultimately has an impact on service continuity. The study aims to explain government regulations in financing Covid-19 in hospitals, the obstacles to implementing these policies, and their impact on hospital finances in Indonesia.

The corona virus outbreak has caused a decrease in outpatient visits and non-Covid-19 inpatient visits. This condition resulted in a decrease in occupancy levels. This resulted in hospital income falling between 30-50 percent. Disrupted cash flow causes hospital operational costs to increase. If this condition continues, the hospital will be threatened with collapse and services will stop (Bratianu, C. 2020).

Health problems cannot be resolved well without adequate financial support. Health financing is a factor that significantly influences health quality. Therefore, it is necessary to carry out research regarding the difference in length of stay for patients with comorbidities and without comorbidities on the impact of funding for the care of Covid patients in hospitals so that prevention of Covid disease can be improved and the effectiveness of Covid treatment is shortened, especially the length of treatment. The title of the research is " Analysis difference in length of day inpatient Covid-19 patients with a history of comorbidities and without a history of comorbidities in hospitals in Central Sulawesi Province.

Research Purposes

1. General purpose

To find out the difference length of stay for Covid-19 patients with a history of comorbidities and without a history of comorbidities in Central Sulawesi provincial hospitals in 2023

2. Special purpose

a. To find out the length of stay for Covid-19 patients with a history of comorbidities in hospitals in Central Sulawesi province in 2023

c. To find out the length of stay for Covid-19 patients with no history of comorbidities in Central Sulawesi provincial hospitals in 2023

d. To find out the difference length of stay for Covid-19 patients with a history of comorbidities and without a history of comorbidities in Central Sulawesi provincial hospitals in 2023

Benefit

It is hoped that the results of this research can increase the wealth of knowledge about Covid-19 disease, especially the length of treatment time for Covid-19 patients with a history of comorbidities and without a history of comorbidities and as input for doctors and other health workers in making efforts to prevent the transmission of Covid-19 and can used as data for further research.

2. Materials And Methods

This research uses a *cross-sectional type of research* with the aim of seeing the difference in length of stay for Covid-19 patients with a history of comorbidities and without a history of comorbidities in Central Sulawesi provincial hospitals.

The population in this study were all patients undergoing treatment in intensive care isolation rooms for Covid-19 in all hospitals in Central Sulawesi province in March – July 2023. The research sample was a portion of patients undergoing intensive care isolation treatment at 3 hospitals, namely (RSU Madani Palu, RSUD Luwuk and RSUD Poso) totaling 96 samples using the proportion estimation formula. Data collection was carried out in March - July 2023 in 3 hospitals in Central Sulawesi province, namely RSU Anutapura Palu, RSU Poso and RSUD Luwuk using *Accidental Sampling*.

The data analysis used was content analysis and using the Mann *Whitney* test to determine the difference in length of stay for patients with comorbid Covid - 19 and without comorbid Covid - 19.

3. Results and Discussion

Based on the results of observations and distribution of questionnaires carried out in the Central Sulawesi region, a description of the characteristics of the respondents in this study was obtained, including:

Respondents Based on Age

The age frequency distribution can be seen in table 1:

Table 1 Distribution of Respondents Based on Age in Regions Central Sulawesi

Age	F	%
< 10 Years	4	4.2
11- 20 Years	9	9.4
21-30 Years	13	13.5
31-40 Years	12	12.5
41-50 Years	16	16.7
>50 Years	42	43.8
Total	96	100

Source: Primary Data 2023

age distribution of respondents shows that respondents aged <10 years amounted to 4 people (4.2%), aged 11-2- years amounted to 9 people (9.4%), aged 21-30 years amounted to 13 people (13.5%), aged 31- 40 years old amounted to 12 people (12.5%), aged 41-50 years amounted to 16 people (16.7%) and those aged >50 years amounted to 42 people (43.8%)

Respondents Based on Diagnosis

The frequency distribution of diagnoses can be seen in table 2:

Table 2. Distribution of Respondents Based on Comorbid Diagnosis In the Central Sulawesi **Region**

Diagnosis	F	%
There isn't any	35	36.5
Bronchopneumonia	4	4.2
CHF	6	6.3
CKD	6	6.3
PRAYER	1	1.0
DM	11	11.5
GNA	2	2.1
HHD	3	3.1
Hypertension	3	2.1
HIV	1	1.0
Ileus	1	1.0
Melena	1	1.0
NSTEMI	1	1.0
Pneumonia	19	19.8
Sepsis	1	1.0
SNH	1	1.0
Total	96	100.0

Source: Primary Data 2023

The distribution of diagnoses shows that those who have a diagnosis of DOA, HIV, Ileus, Melena, NSTEMI, Sepsis, SNH amount to 1 person each (1%), who have a diagnosis of Bronchopneumonia totaling 4 people (4.2%), who have a diagnosis of CHF and CKD totaled 6 people (6.3%), DM totaled 11 people (11.5%), GNA totaled 2 people (2.1%), HHD and Hypertension totaled 3 people each (3.1%), Pneumonia totaled 19 people (19.8%). %) and those who did not have comorbidities were 35 people (36.5%)

A. Normality test

Before the data is collected, a normality test is carried out first. The normality test used on the data is the *Kolmogorov-Smirnov test* with a significance of 0.05. a variable is declared to have a normal distribution if $p > 0.05$. The following is the normality of the data used in this research:

B. Research result

Univariate Analysis

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

Data analysis, in this the data analysis technique to determine the research results used univariate (percentage) and bivariate (Mann Whitnay) data analysis, the technique used is to identify frequency, percentage (%), mean (average), and deviation (SD).

Distribution Based on Comorbidities

To get an overview of the distribution based on comorbidities, see the following table:

Table 3 Distribution Based on Comorbidities in the Central Sulawesi Region

Comorbid	F	%
Comorbid	61	63.5
Not Comorbid	35	36.5
Total	96	100.0

Source: Primary data for 2023

In table 3 above, it can be seen that there were 61 Covid-19 patients who had comorbidities (63.5%) and 35 people who did not have comorbidities (36.5%)

Distribution Based on Length of Hospitalization for Covid-19 Patients

To get an idea of the distribution of length of stay for Covid-19 patients, see the following table:

Table 4 Distribution Based on Length of Hospitalization for Covid-19 Patients in the Central Sulawesi Region

Length of Hospitalization	F	%
Long	11	11.5
Not long	85	88.5
Total	96	100

Source: Primary data for 2023

In table 4 above, it can be seen that there were 11 Covid-19 patients who had a long hospital stay (>12 days) and 85 people who had a short hospital stay (<12 days) (88.5%)

Bivariate Analysis

To analyze the difference between two means (avarage), the analysis technique used is the with the following analysis

Table 5 Differences in length of stay for Covid-19 patients with a history of comorbidities and without comorbidities in the Central Sulawesi region

Variable	N	Mean Rank	Amount	Sig. (2-tailed)
Length of Hospitalization Days	Comorbid	61	49.28	0.512
	Not Comorbid	35	47.14	

Source: Primary data for 2023

Based on table 5, it can be seen that the mean average length of stay with comorbidities is 49.28, while the mean average length of stay without comorbids is 47.14. Statistical results using *Mann Whitney* showed that the p -value was 0.512 (> 0.05) so that H_0 was accepted, so it can be concluded that there is no difference in the length of stay in Covid-19 patients with a history of comorbidities and without a history of comorbidities.

The results of univariate research show that the highest length of stay in hospital is for Covid patients who are undergoing treatment for a short time with a proportion of 88.5% and those with a history of comorbidities have the most comorbidities with a proportion of 63.5%. The results of the *Mann Whitney* statistical test show that there is no difference in the average frequency of length of stay for Covid-19 patients with a history of comorbidities and without comorbidities. with the value p Value 0.512

According to the researchers' assumption, there is no difference in the length of stay for Covid-19 patients with a history of comorbidities and those without comorbidities, this could be because both patients undergoing treatment > 12 days and ≤ 12 days on average are accompanied by comorbidities so there is no difference in the length of treatment with comorbidities because The level of Covid patients admitted to hospital who are confirmed positive experience symptoms ranging from asymptomatic, very mild symptoms, to clinical conditions such as acute respiratory failure which requires the use of oxygen and mechanical ventilation. This depends on the level of severity experienced by the patient. The severity of a Covid patient if accompanied by comorbidities and advanced age will affect the symptoms that appear, requiring intensive action or treatment, thus affecting the length of stay (LoS). The most common comorbidities in Covid -19 patients as a result of research are respiratory system diseases, namely pneumonia, followed by diabetes, cardiovascular and other diseases. Patients with comorbidities or comorbidities are known to have a higher mortality rate than ordinary patients. Exposure to Covid -19 in comorbid individuals, for example diabetes sufferers, can affect the lungs, heart, kidneys and liver.

Patients entering the hospital with mild or moderate symptoms will be treated in the usual isolation treatment room. If a Covid patient is admitted to the hospital with comorbid and in severe condition they will immediately be admitted to a special Covid-19 isolation intensive care room. For patients with uncontrolled comorbid, the patient is treated with special monitoring, thus prolonging the patient's length of stay. So, the higher the patient's severity level, the more actions given, the longer the patient's treatment days, which has an impact on the cost of treating Covid-19 patients, especially Covid-19 patients with comorbidities. Covid patients who experience hypoxemia which is very abnormal in the lung mechanism will experience respiratory problems as a result of lack of oxygen. Interventions to increase the oxygen needs of Covid patients will increase the cost of special care measures including installation of ventilators, use of broad-spectrum antiviral drugs

The hospital will provide professional services in accordance with operational standards set by the Ministry of Health so that the complications and severity that patients will experience can be resolved, which has the effect of reducing the length of Covid treatment so that patients go through a number of critical phases and speed up the recovery process. The criteria for a patient to be declared cured are through two *swab tests and the results are negative*. The length of treatment from admission to being declared cured takes two weeks for patients without comorbid, and 3 weeks for patients with comorbid. The length of time a patient is treated and recovered varies depending on each individual (Ministry of Health of the Republic of Indonesia, 2020)

According to research (Rees *et al.*, 2020), which is a *systematic review research* related to *length of stay (LoS)* or length of stay for Covid-19 patients, it is revealed that each hospital has different services regarding the availability of oxygen and ventilators, for each patient. get different levels of service so that it will affect the *length of stay (LoS)*. Recovery time from coronavirus will depend on how severe the infection is. Some people will recover quickly, but in other groups the symptoms can get worse. Age, gender, and history or condition of health problems can be factors that determine the time period for recovering from the Corona virus

The results of this study are in line with research conducted by Huang *et al.*, (2020), research on hypertension in Covid-19 patients found no significant difference in the length of stay (LOS) of Covid-19 patients with hypertension and Covid-19 patients without hypertension. . The cohort study by Coca *et al.* stated that there was no significant difference in length of stay between Covid-19 patients suffering from CKD and patients without CKD.

In contrast to Satria's (2020) research, it was stated that the comorbid patients observed could have more than one comorbidity. Patients who have comorbidities are on average > 45 years old . From the observed Covid-19 patient data, 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 comorbid heart disease have a 4,319 times greater risk. Most patients without heart comorbidities died

due to Covid-19, with p 0.009. Meanwhile, comorbid hypertension, TB, COPD, CKD, CVA, pregnancy, asthma and HIV/AIDS are not risk factors for Covid-19 death because the p value is > 0.05 .

The results of this study are different from the results of research conducted by Fang et al (2021) which stated that Covid-19 patients with comorbidities had a longer length of stay than patients without comorbidities at the usual, severe and critical levels. Covid-19 patients 19 who had two or more chronic diseases had longer hospital stays than patients without comorbidities

The impact of Covid-19 on hospital operations has had a huge impact on the hospital's financial condition. The policy during the Covid-19 pandemic issued by the regulator related to financing claims for Covid-19 services meant that hospital management was always active in making adjustments or implementing strategies to provide the best service to patients in order to avoid claim disputes which could lead to hospital losses. A dispute claim is a claim that after verification has been carried out by BPJS Health and there is a discrepancy between the hospital and BPJS Health (Hidayah, 2020). Costs during the pandemic have increased tremendously. These costs include the costs of establishing a negative pressure isolation room, additional needs for consumables (BHP) and consumable medical goods (BMHP). The need for PPE is adjusted to the standards for use of PPE set by the hospital's infection prevention and control (PPI) team which previously had the effect of increasing the hospital's operational burden (Bartsch, Sarah M. 2021).

4. Conclusion

The results of the *Mann Whitnay* statistical test show that there is no difference in the average frequency of length of stay for Covid-19 patients with a history of comorbidities and without comorbidities with a p value of 0.512. The Covid-19 pandemic has resulted in increased hospital operational costs, which has had an impact on the APBN

Suggestion

It is hoped that the hospital, especially the Health Promotion section, will always disseminate health education about the factors that influence the length of stay and treatment of Covid-19 patients with and without comorbidities. Covid cases accompanied by comorbidities are mostly elderly, so education is needed. prevention of Covid through leaflets and Covid pocket books at Posyandu for the elderly.

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