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Direct Medical Costs and Accordance of INA-CBG's Claims on Covid-19 Patients at Anutapura Hospital

(*Biaya Medis Langsung dan Kesesuaian Klaim Tarif INA-CBG's pada Pasien Covid-19 di RSU Anutapura*)

Muhamad Rinaldhi Tandah[1], Khusnul Diana[1*], Arya Dibyo Adisaputra[1], Shella Monica[2], Fatimah Azzahrah[2]

[1]*Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako Universty, Palu, Indonesia.*
[2]*Undergraduate Student, Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako Universty, Palu, Indonesia.*
[*]*E-mail: khusnuldianakd@gmail.com*

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Corresponding Author:
Khusnul Diana
Jurusan Farmasi
Fakultas MIPA
Universitas Tadulako
Palu
90245
Indonesia
email: *khusnuldianakd@gmail.com*

ABSTRACT

Background: The pandemic Covid-19 has an impact on various aspects of life, both socially and economically. One of the government's responsibilities is in financing the treatment of Covid-19 patients, stated in the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/MENKES/5673/2021 regarding technical instructions for claiming the cost of Covid-19 services. **Objectives:** This study aimed to determine the average direct medical costs and according to the INA-CBGs rates for Covid-19 patients and the effect of length of stay, severity and comorbidities on the total cost from a hospital perspective. **Material and Methods:** This study was an observational descriptive study, used a sample of patients diagnosed with Covid-19 inpatients at Anutapura Hospital Palu in 2020. The sample was used 134 patients, who met the inclusion and exclusion criteria. The data collected includes patient characteristics, direct medical costs (consultation fees, visits, rooms, medical procedures, medical devices, examinations and drugs) and INA-CBGS rates. **Results:** the Covid-19 patients were hospitalized for 14 days (65.67%) with severe severity (92.54%), patients without comorbidities (comorbidities) (74.63%) and included in the group with INA-CBGs code was A-4-13-III (92.54%). The average direct medical cost of the patient was Rp. 5,371,333, with the largest cost being the room fee, which was 32.57% of the total cost. The average INA-CBG's tariff was Rp. 123,019,851. **Conclusions:** The INA-CBGs tariff was higher than direct medical costs with a difference of Rp. 117,648,518. The results of the linear regression test found that there was a partial or simultaneous effect between length of hospitalization, severity and incidence of comorbidities on total direct medical costs.

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ABSTRAK

Latar Belakang: Pandemi Covid-19 berdampak pada berbagai lini kehidupan baik sosial maupun ekonomi. Tanggung jawab pemerintah salah satunya dalam pembiayaan perawatan pasien Covid-19 yang tertuang dalam Kepmenkes RI Nomor HK.01.07/MENKES/5673/2021 tentang petunjuk teknis klaim penggantian biaya pelayanan pasien Covid-19. Tujuan: Penelitian ini bertujuan untuk mengetahui rata-rata biaya medis langsung serta kesesuaian dengan tarif INA-CBGs pasien Covid-19 serta pengaruh lama perawatan, keparahan dan komorbid terhadap total biaya dari perspektif rumah sakit. Bahan dan Metode: Penelitian ini merupakan penelitian deskriptif observasional, menggunakan sampel pasien terdiagnosis utama Covid-19 rawat inap di RSU Anutapura Palu tahun 2020. Sampel yang digunakan 134 pasien, yang menenuhi kriteria inklusi dan eksklusi. Data yang dikumpulkan meliputi karakteristik pasien, biaya medis langsung (biaya konsultasi, visite, kamar, tindakan medis, alat kesehatan, pemeriksaan dan obat) dan tarif INA-CBGs. Hasil: pasien Covid-19 adalah laki-laki (52,24%), kelompok usia >45 tahun lebih banyak terinfeksi (48,51%), dirawat ≥ 14 hari (65,67%) dengan tingkat keparahan berat (92,54%), pasien tanpa penyakit penyerta (komorbid) (74,63%) dan termasuk dalam grup dengan kode INA-CBGs adalah A-4-13-III (92,54%). Rata-rata biaya medis langsung pasien sebesar Rp. 5.371.333, dengan biaya terbesar adalah biaya kamar yaitu 32,57% dari total biaya. Rata-rata tarif INA-CBG's adalah Rp. 123.019.851. Kesimpulan: Tarif INA-CBGs lebih besar dari biaya medis langsung dengan selisih sebesar Rp. 117.648.518. Hasil uji regresi linier, didapatkan bahwa terdapat pengaruh parsial maupun simultan antara lama rawat inap, keparahan dan kejadian komorbid terhadap total biaya medis langsung.

Kata kunci: Covid-19, biaya medis langsung, tarif INA-CBG's.

INTRODUCTION

Corona Virus Disease (Covid-19) is a virus that can cause disease in animals and humans. Covid-19 that attacks humans can cause respiratory infections ranging from the common cold to more severe diseases. In December 2019 Covid-19 began to occur in Wuhan, Hubei Province, and has spread very quickly throughout China. The emergence of Covid-19 is considered to be a pandemic that attacks all countries in the world (Sukur et al., 2020).

One of the impacts of the Covid-19 spreading is the decline in the rate of world economic growth. The International Monetary Fund (IMF) states that world economic growth will decline by 0.1-0.2% to 3.3% in 2020 and the Organization for Economic Co-operation and Development (OECD) predicts a slowdown in world economic performance. due to reduced number of supply chains and reduced demand for commodities. There is a need for international cooperation to overcome the Covid-19 pandemic. UN Humanitarian Chief, Mark Lowcock spent 15 million US dollars from The Central Emergency Response Fund (CERF) to assist international financing in overcoming the spread of the Covid-19 virus (Lisbet, 2020).

The increasing number of Covid-19 cases has a very large impact on the Indonesian economy. The government has increased the budget allocation for handling the Covid-19 pandemic to 677.2 trillion rupiah from the original 405.1 trillion rupiah. Of this nominal, 87.55 trillion rupiah is earmarked for the health sector (Yusa, 2020).

Claims for service costs for Covid-19 patients are carried out by government and private hospitals that are able to provide services to Covid-19 patients. Covid-19 cost claims have the task of reimbursement for Covid-19 patient services and making payments to health care facilities. National

health insurance cooperates in managing claims for Covid-19 patients. Based on the circular regarding the claims of Covid-19 patients, it explains that the cost of service claims is charged to the service guarantee for Covid-19 patients until it is declared by the doctor in charge that clinically, radiologically, and laboratory they are improving and may return home (Setiatin, 2020).

Indonesia Case Based Groups (INA-CBG's) tariff is the amount of claim payment by BPJS Health to advanced level referral health facilities for service packages based on disease diagnosis groupings and procedures. Budiarto and Sugiharto (2013) stated that data on inpatient Jamkesmas participants in 10 hospitals belonging to the Ministry of Health stated that the cost of INA-CBG's claims was 14.39% higher than the cost according to hospital rates. The Ministry of Health of the Republic of Indonesia stated regarding the technical claim for reimbursement of the cost of treating Covid-19 patients where the payment pattern used in Covid-19 claims is the INA-CBG's tariff which is given a top up according to the length of treatment which is calculated as cost per day so that the financing will be more effective and efficient (Decree of the Minister of Health of the Republic of Indonesia, 2020).

The spread of the Covid-19 outbreak in Indonesia, especially in Palu City, Central Sulawesi, is still relatively high, with 1766 people being confirmed positive, 1157 people recovering, and 55 people dying from Covid-19 (Central Sulawesi Provincial Health Office, 2019). Anutapura Hospital in Palu City is one of the B-accredited public hospitals that accepts Covid-19 patients and is one of the government referral hospitals that has adequate facilities, both in terms of capacity and adequate health equipment for patients Covid-19. There were no information has been released by the hospital nor insurance perspective regarding real cost of Covid-19 patient treatment, which can be used to synchronize the paid claimed by the hospital. This research was conducted to fulfill the information needed.

METHODS

This research was a descriptive type of research through a pharmacoeconomic study based on hospital perspective. Data were collected retrospectively which included secondary data, namely patient characteristics data (gender, age, length of hospitalization, severity, comorbidities, and INA-CBG's group code), clinical characteristics (types of comorbid and Covid-19 treatment drugs), cost data direct medical services (consultation fees, room visits, medical procedures, medical devices, examinations, medical devices, drugs), and INA-CBG's tariff data. The data was obtained from the medical records, finance and claims section of BPJS. The data obtained will then be analyzed descriptively and linear regression test to see the effect of the variable length of hospitalization, severity and comorbidities on the total medical costs of Covid-19 patients, either partially or simultaneously.

The population of Covid-19 patients diagnosed patients who underwent hospitalization at the Anutapura Palu General Hospital along the year of 2020 was 438 patients. The sample in this study were the Covid-19 patients who met the inclusion and exclusion criterias, and obtained a total of 134 patients. The inclusion criteria were patients diagnosed/confirmed with Covid-19 at Anutapura Hospital Palu with tariff codes A-4-13-I (mild viral and non bacterial infection) and A-4-13-III (severe viral and non bacterial infection) in March-December 2020; patients with complete medical records and financial data; patients who were hospitalized in a special room for Covid-19 patients, as well as undergoing treatment for the first time. The exclusion criteria were patients with incomplete or missing medical records, passed away patients, and suspected patients (not laboratory proven infected).

This research has been approved by the Medical and Health Research Ethics Committee, Faculty of Medicine, Tadulako University with letter numbers 5322/UN28.1.30/KL/2021 and: 2666/UN28.1.30/KL/2022.

RESULTS AND DISCUSSION

Sample characteristic

Covid-19 patients at the Anutapura Hospital Palu were dominated by male of 52.24% (Table 1). This showed that men were more susceptible to exposure to Covid-19 infection. The results of Styawan's research, regarding to the Covid-19 demographic, it said that confirmed female patients was outnumbered by male at 51.5% (Styawan, 2021). In the study of Alon et al. (2020), male workers were usually more strongly affected than women. This incident was possible because the mobility of men tends to be higher outside the home than women who spend more time on domestic work. In addition, this also confirmed that there were differences in behavior between men and women in maintaining their health. Women tend to be more concerned with their own health than men (Gebhard et al., 2020). The results of a survey conducted by the Central Statistics Agency found that during the pandemic, women tended to be more disciplined in implementing health protocols such as wearing masks, washing hands with soap, and maintaining physical/social distance (Central Bureau of Statistics, 2020).

The highest incidence of infection with Covid-19 patients was at age more than 45 years with a total of 65 patients (38.06%). The condition of a person's immunity tends to decrease compared to when he was young. This is due to dysregulation in the human body associated with a decrease in the immune system. In addition to decreased immunity, susceptibility to pathogens is higher. Results Based on research of Hidayati (2020), the percentage of DKI Jakarta residents who were positive for Covid-19 shifted to the 46-59 year age group. Biologically, as a person ages, the immunity decreases. This condition results in the elderly population not having a good immune system when exposed to Covid-19 (United Nations, 2020).

Table 1. Patients' characteristic

Patients Characteristic	**Amount of Patient (n=134)**	**Percentage (%)**
Gender		
Male	70	52,24
Female	64	47,76
Age		
Less than 5 years old	1	0,75
5-18 years old	5	3,73
19-30 years old	36	26,87
31-45 years old	27	20,15
More than 45 years old	65	48,51
Treatment Duration		
Less than 14 days	46	34,33
More than or equal to 14 days	88	65,67
Severity		
Mild	10	7,46
Moderate	0	0
Severe	124	92,54
C*omorbid*		
Without *Comorbid*	100	74,63
With C*omorbid*	34	25,37
INA-CBGs Group		
A-4-13-III (Severe Viral and Non Bacterial Infections)	124	92,54
A-4-13-I (Mild Viral and Non Bacterial Infections)	10	7,46

The length of treatment in this study divided into 2 groups, which were less than 14 days and more than 14 days of treatment. The results obtained were dominated by the length of hospitalization of 14 days as many as 88 patients (65.67%). This was in line with Styawan (2021), the duration of Covid treatment ranged from 2-3 weeks (41.7%). At Anutapura Hospital itself, at the beginning of the pandemic, clinicians still followed the criteria for returning Covid-19 patients according to the rules of the Health Ministry of Indonesia, patient will be discharged if the results of the PCR Swab are negative twice in a row (Decree of the Minister of Health of the Republic of Indonesia, 2020).

The severity of the Covid-19 inpatients at the Anutapura Hospital Palu for the 2020 period was the majority of patients with severe severity as many as 124 patients (92.54%). Most of the patients at Anutapura Palu General Hospital are older where age greatly affects the severity of disease and mortality in Covid-19 patients because the immune system will decrease with age. Concomitant diseases, especially chronic diseases, also have the potential to be more susceptible to infection and have a higher probability of causing severe clinical manifestations.

Based on the category of comorbidities, it was found that Covid-19 patients were dominated in the category of infected patients without comorbidities as many as 100 patients (74.63%). Most of the patients who were hospitalized had laboratory test results such as the average SGOT and SGPT levels in Covid-19 patients without comorbidities that were within the normal range and the average urea and

creatinine levels were also within the normal range. This also happened in Styawan's study, that Covid-19 patients without comorbidities were more dominant, as many as 48 patients (63.2%) (Styawan, 2021). In INA-CBG's claim data, the Covid-19 patient group code is classified into 3, namely A-4-13-I, A-4-13-II and A-4-13-III. This code indicates the group of patients with viral and other non-bacterial infections, with degrees of mild, moderate and severe severity indicated by the Roman numerals behind them. The results showed that the majority of patients included code A-4-13-III, namely 124 patients (92.54%) who were patients with viral and other non-bacterial infections with high severity.

Clinical characteristic

Type of Comorbid

Table 2. Distribution of comorbidities

Comorbid type	Number of events (n=44)	Percentage (%)
Nondependent Diabetes Melitus without complication	20	45,45
Essential Hipertension (primary)	10	22,73
Hipertension heart disease without heart failure (congestive)	5	11,36
Congestive heart failure	4	9,09
Atherosclerosis heart disease	1	2,27
Chronic renal failure	1	2,27
Non allergic asthma	1	2,27
Insomnia	1	2,27
Left ventricular failure	1	2,27

Handling comorbidities is one of the important things in the management of Covid-19 patients so that they are not at risk of experiencing dangerous Covid-19 complications such as respiratory failure and cytokine storms. The results of the study showed as many as 34 patients with comorbidities, and 10 of them had comorbidities of more than 1 (Table 2). The most dominant type of comorbidity was diabetes mellitus as many as 20 cases. Patients with co-morbidities with diabetes mellitus have a 2 times greater risk of developing severe or critical illness and high blood sugar levels of people with diabetes mellitus result in weakening of the immune system and can trigger disease complications. Patients with diabetes mellitus are three times at risk of suffer from Covid-19. Supported by the study of Satria et al. (2020), the highest comorbid disease was diabetes mellitus as many as 37 patients (14.62%). This research was also in line with research by Pepitasari and Anggraini (2021), the most co-morbidities were Covid-19, namely diabetes mellitus as many as 15 patients (28.85%). This is due to high blood sugar levels in people with diabetes mellitus resulting in weakened immune systems, can trigger disease complications

and Covid-19 infection can accelerate organ damage for people with diabetes mellitus (Pepitasari and Anggraini, 2021).

Hypertension was the second highest comorbid in Covid-19 patients at Anutapura Hospital (22.73%). Patients with hypertension in cases of Covid-19 infection will experience an increase in ACE-2 which causes a high susceptibility to SARS-CoV-2 infection, especially treatment with angiotensin II receptor blockers (ARBs) and angiotensin converting enzyme inhibitors (ACEIs). It can lead to worsening of severity of SARS CoV-2 infection due to increased viral binding to target cells that utilize ACE-2 (Rahayu et al., 2021). The study of Styawan (2021) also showed that there were 11 patients (4.34%) of Covid-19 patients with comorbid hypertension.

Covid-19 Treatment at Anutapura Hospital

In Covid-19 patients, those who will receive drug therapy were patients with clinical symptoms. The type of drug given depends on the severity of the patient and the clinical symptoms that appear. The distribution of drug given to Covid-19 patients at Anutapura Hospital can be seen in Table 3 as follows.

Table 3. Covid-19 medicine in Anutapura Hospital

Drug Category	Amount of Utillization
Vitamin and Suplemen	
Vitamin C	85
Zink	15
Antivirus	
Favipiravir	40
Remdesivir	10
Corticosteroid	
Dexamethasone	23
Metilprednisolone	6

The type of drug most often used by Covid-19 patients was vitamin C as many as 85 patients. Vitamin C has antioxidant activity to inhibit cell damage caused by oxygen and nitrogen free radicals and improve immune cell function. In the study of Arief et al. (2021), the highest use of vitamin C was used by 200 patients (90.05%). It was also supported by other study, 73 patients (71.6%). This was because vitamin C is useful as an essential nutrient that functions as an antioxidant and acts as a co-factor and modulator of various immune system pathways (Milani et al., 2021).

Favipiravir belongs to the antiviral class, used in 40 patients of this research. Favipiravir has the potential to inhibit the replication of various types of RNA viruses. The drug favipiravir works by selectively inhibiting RNA dependent RNA Polymerase (RdRp) which is one of the enzymes used for transcription and replication of viral RNA genomes. In a study by Arief et al. (2021), 42 patients (19%) used favipiravir. The use of favipiravir had a good recovery rate of 71.43%. This was because the active agent favipiravir will inhibit RNA polymerase and stop virus replication (Styawan, 2021).

Remdesivir is an antiviral group used in 10 patients. Remdesivir has activity against various types of viruses including MERS-CoV and SARS-CoV1 and is able to reduce the ability of virus replication.

Based on the results of Styawan (2021), as many as 94.3% of patients who received remdesivir treatment.

Dexamethasone and methylprednisolone, which are included in the corticosteroid group, used in 23 patients and 6 patients. Utillization of low-dose corticosteroids such as dexamethasone and methylprednisolone can reduce mortality in patients with severe conditions. Dexamethasone proven reduced swelling of the lung and prohibited worsening of ventilator parameter of patient, which is improved oxygenation (Horby et al., 2020). In study of Pinzón et al. (2021), 111 patients used Dexamethasone and 105 patients used methylprednisolone in low-dose Covid-19 therapy.

Zinc was used in 15 patients. This was due to the presence of antiviral activity by inhibiting viral RNA polymerase so that it inhibits in vitro replication and plays a role in balancing the immune system. Supported by the results of (Styawan, 2021), a group of patients took zinc as many as 75.3%.

Characteristic of direct medical expenses

The following were the results of direct medical costs for Covid-19 patients at Anutapura Hospital in 2020:

Table 4. Direct medical costs of Covid-19 patients at Anutapura Hospital

Direct Medical Cost Category	Average± SD (Rp.)	Percentage (%)
Consultation	35.000±0	0,65
Visite	341.696±125.972	6,36
Room	1.749.701±616.391	32,57
Medical treatment	1.025.963±711.076	19,10
Medical device	100.959±85.340	1,88
Examination	829.000±433.582	15,43
Drugs	1.362.263±2.463.235	25,36
Average real cost	5.371.333±3.313.322	100,00
Average INA-CBG's rate	123.019.851±43.233.387	
Difference	117.648.517	

It can be seen that the average total direct medical costs of Covid-19 patients at the Anutapura Palu General Hospital in 2020 was Rp. 5,371,333, with the highest percentage was the room cost component, at cost Rp. 1,749,701 (32.57%). The high room cost was due to the length of treatment for Covid-19 patients at Anutapura Hospital, which dominated by the group of treatment duration 14 days. This Was also in line with the majority of patients classified as high severity (Table 4).

The drug cost component in this study was 25.36% of the total patient cost. Based on the results of research by Rahmandani et al. (2021), which stated that one of the largest expenditures was the cost of drugs undergoing treatment 9.21 days. It was illustrated as the average length of stay of patients using favipiravir for approximately 9.21 days of 1,291,741 ± 4,741 (Rahmandani et al., 2021). In other study,

it was stated that patients with high severity require antiviral drugs such as remdesivir and favipiravir which have relatively expensive prices (Ambarwati, 2021).

The average rate for INA-CBG's inpatient Covid-19 patients at Anutapura Hospital was Rp. 123,019,851. INA-CBG's rate for each patient was obtained from BPJS data. There was a discrepancy between costs and the difference in the value of Rp. 117,648,517 between direct medical costs of patients and INA-CBG's rates, with a positive difference, which showed the claims for INA-CBG's rates greater than real cost spent. The positive difference means that the direct medical costs incurred by hospitals in treating Covid-19 patients do not exceed the rates set by the government, so that will not cause potential hospital losses. The results of this study were in accordance another study which given a positive difference, where the total real cost was lower than the INA-CBG's tariff, which mean the success of the hospital in carrying out treatment efficiently and effectively (Lakoan et al., 2019).

In the Ministry of Health's technical instructions, it is explained that the INA-CBG's tariff components include service administration components, accommodation, doctor services, room actions, use of ventilators, diagnostic support tests, consumable medical materials, medicines, medical devices, ambulance referrals and other health services according to the patient's medical needs (Decree of the Minister of Health of the Republic of Indonesia, 2020). The magnitude of the difference in costs was possible because in this study only medical costs were collected. Other costs that were borne by the hospital outside of direct medical care were not recorded.

Effect of length hospitalization, severity, and comorbid incidence on direct medical costs

Partial Linear Regression Test

The Kolmogorov Smirnov normality test was carried out previously and obtained a significance value (Sig.) below 0.05, which mean that the data were normally distributed. Furthermore, a linear regression test was used to determine the effect of length of stay, severity, and number of comorbidities on the direct medical costs of Covid-19 patients. The following results were obtained as shown in Table 5.

Table 5. Linear Regression Test Results Effect of Length of Hospitalization on Direct Medical Costs

Variable	R (Correlation)	R^2	B	t_{count}	p-value
Length of Hospitalization	0,444	0,197	287914,467	5,698	0,000
Constant			893618,602		
Severity	0,217	0,047	2724202,330	2,552	0,012
Constant			126227,169		
Comorbid	0,280	0,078	1518433,581	3,347	0,001
Constant			4872743,018		

The variable length of hospitalization has a direct relationship with total medical costs, as seen from the R value, which was 0.444. The correlation categorized into weak correlation. The t_{count} value was 5.698 more than 1.97838 (t_{table}) and the p-value 0.000 (less than 0.05) mean that the length of hospitalization

has a significant effect on direct medical costs. The value of R Square (R^2) was 0.197 (19.7%), meaning that the length of hospitalization has an influence contribution to the dependent variable of 19.7%. The remaining 80.3% was influenced by other variables outside this regression equation or variables that were not explored. The regression equation that can be arranged was as follows: Y = 893618,602+ 287914,467X1. The regression coefficient value was positive at 287914,467, meaning that the longer the hospitalization, the higher the direct medical costs of the patient. If the length of stay was increased by one day, the direct medical costs will increase by Rp. 287,914,- and vice versa. The length of treatment was a factor that affects the medical costs of Covid-19, because medical costs in hospitals were calculated per day, the length of treatment will increase medical procedures or actions, so the longer the patient is treated, the higher the cost (Munawaroh et al., 2019). This is in line with Oksuz reasearch, namely the length of treatment has a significant relationship with the total cost of Covid-19 patients, meaning that the length of treatment affects the total cost, because the longer the patient is treated, the supporting costs, treatment costs, drug costs will be higher, so it will affect the total cost of treatment Covid-19 (Oksuz et al., 2021).

Severity has a direct relationship with total medical costs seen from the R value, which was 0.217, and was included in the weak category of correlation. The t_{count} value of the test results was 2.55 (more than 1.98 t_{table}), with a p-value of 0.01 (less than 0.05), meaning that severity has a significant effect on direct medical costs. The value of R Square (R2) was 0.047 (4.7), meaning that the severity has an influence contribution to the dependent variable of 19.7%. The remaining 95.3% was influenced by other variables outside this regression equation or variables that were not examined. The regression equation compiled was as follows:

$$Y = 126,227+ 2,724,202X_{1.}$$

The regression coefficient value was positive at 2,724,202, meaning that the higher the severity level, the higher the direct medical costs of the patient. If the severity increases by one level, the direct medical costs will increase by Rp. 2,724,202, -, and vice versa. Severity is based on comorbidities as well as age. The more comorbid patients have will increase the level of severity and result in more medical actions and procedures to be carried out, making the patient stay longer. This certainly affects the medical costs incurred by patients during treatment (Munawaroh et al., 2019). Mild and high severity makes patients receive longer and more complex treatment, thus making the costs borne by patients higher, both from the cost of drugs, medical actions, medical devices, hospitalization, and examinations (Oktadiana, 2021).

Comorbidities (comorbid) have a direct relationship with total medical costs, which is seen from the R value of 0.280, and were included in the weak category of correlation. The t-count value was 3.35 > 1.98 (t Table), with a p-value of 0.001 (less than 0.05), meaning that comorbid variables have a significant effect on direct medical costs. The value of R Square (R^2) was 0.078 (7.8%), meaning that

comorbids have an influence contribution to the dependent variable of 7.8%. The remaining 92.2% was influenced by other variables outside this regression equation or variables that were not examined. The regression equation that can be compiled as follows:

$$Y = 4{,}872{,}743 + 1{,}518{,}433X1$$

The regression coefficient value was positive at 1,518,433 meaning that the presence of comorbidities will increase the direct medical costs of Covid-19 patients at Anutapura Hospital. If the number of comorbids increases by one, the direct medical costs will increase by Rp. 1,518,433 and vice versa. The more comorbids a patient has, the more care the patient will provide and require longer and more treatment, thus making the costs incurred also increase (Nisa and Raharjo, 2018).

Simultaneous Linear Regression Test

Table 6. Simultaneous linear regression test results

Dependent variable	R^2	F_{count}	p_{value}
Direct Medical Expenses	0,273	16,239	0,000

Based on the table 6, the p value is 0.000 (less than 0.05) and F_{count} 16.24 is more than F_{table} 2.44. It means the independent variables simultaneously or jointly affect the dependent variable. Independent variabls were length of hospitalization, severity, and comorbidities. Dependent variable was direct medical costs for Covid-19 patients at Anutapura Hospital. The value of Adjusted R^2 was 0.27 (27.3%), meaning that the contribution of influence to the dependent variable was 27.3%. The remaining 72.7% was influenced by other variables outside this regression equation or variables that were not examined.

CONCLUSION

Based on the research that has been done, it can be concluded that the average direct medical costs of Covid-19 patients at Anutapura Hospital Palu for the 2020 period was Rp. 5,371,333. The average for INA-CBG's rate of Covid-19 patients at Anutapura Hospital Palu was Rp. 123,019,851. There was no match between direct medical costs (real hospital costs) and INA-CBG's rates, which was illustrated by a positive difference of Rp. 117,648,517. There was an effect of length of stay, severity, and comorbidity on total direct medical costs, both partially and simultaneously tested.

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