



Analysis of The Relationship Between Compliance in Taking Pulmonary Tuberculosis Medication in East Kolaka District

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ABSTRACT: Tuberculosis is still a global health problem today. 5.8 million in 2020 and 6.4 million in 2021. The number of 2022 is a large number of people suffering from TB in the previous year. people diagnosed with TB in the world as many as 7.5 million people in 2022. This study is to analyze the relationship between adherence to taking pulmonary tuberculosis medication in East Kolaka Regency. This study was conducted in six working areas of the East Kolaka Regency Health Service, namely at the Tirawuta Health Center, Tinondo Health Center, Lalolae Health Center, Mowewe Health Center, Sanggona Health Center, and Ueesi Health Center in May - June 2024. This type of research is a study using a Cross Sectional Study approach with univariate, Bivariate, and Multivariate analysis. the population is 59 patients spread across six working areas of the East Kolaka Regency Health Service. Chi-Square Test Results of knowledge (P-Value 0.004<0.05), Family Support (P-Value 0.000<0.05), Role of Health Workers (P-Value 0.325), Stigma (P-Value 0.008<0.05), Access (P-Value-0.000<0.05), Income (P-Value-0.002<0.05), Medical Costs (P-Value0.003<0.05). The dominant variable is related to Access to Health Facilities with an OR value of 22.818. Access to health facilities is the main point in obtaining optimal health services. Compliance with taking tuberculosis medication is the basis for the success and completion of tuberculosis disease, it is expected that related parties will provide more emphasis on the consequences of non-compliance with taking tuberculosis medication.

KEYWORDS: Access, Knowledge, Compliance, Income, Family Support, Medical Costs, Role of Health Workers, Stigma, Tuberculosis.

INTRODUCTION

According to the World Health Organization, TB is still a health problem in the world today. 5.8 million in 2020 and 6.4 million in 2021. The number in 2022 may include a large number of people who suffered from TB in previous years. The number of people newly diagnosed with TB in the world was reported to be 7.5 million in 2022. (WHO, 2023). According to data from the Indonesian Ministry of Health, there has been an increase in TB cases in Indonesia in 2023, reaching around 1,060,000 cases. This number is the highest number so far (Dirjen P2P, 2023).

Based on data from the Central Statistics Agency (BPS) of Southeast Sulawesi Province in 2021, the number of diagnosed cases of pulmonary tuberculosis in Southeast Sulawesi in 2021 was 3,008 patients (Kemenkes RI, 2021). Based on the Tuberculosis Control Program Report, there were 6,192 confirmed Tuberculosis cases in Southeast Sulawesi in 2022.(Dirjen P2P, 2023). East Kolaka Regency One of the regencies with a high number of tuberculosis cases, where the number of reported cases in 2021 was 112 reported cases, in 2022 the reported TB cases were 135 cases. And in 2023 the number of Tuberculosis Sufferers became 140 Cases, (Dinkes Koltim, 2023), However, the findings of Tuberculosis cases in the working area of the Health Center under the Kolaka Timur Regency Health Service in the period January - March 2024 became 120 cases, from the data obtained there were 32 cases of absenteeism or incomplete treatment, this was due to the remote access to health services, patients who did not take their medicine on time, and the lack of monitoring of taking medicine from the family (Dinkes Koltim, 2023)

Factors that cause someone to be compliant or non-compliant in taking anti-tuberculosis medication are the patient's level of knowledge, patient motivation, distance from home to the health center, patient treatment costs, family support, the role of health workers, patient knowledge..(Mujamil, 2021b). The most important factor of medication compliance in curing TB patients is oneself. If we are aware that health is very valuable, then compliance in TB treatment will be achieved and TB disease recovery will be easy



for us to get. (Dirjen Pelayanan Kesehatan RI, 2020). Prevention and Control of the Spread of Tuberculosis Disease Requires serious handling from all groups, including Knowledge, Family Support, Role of Health Workers, Stigma, Access to Health Facilities, Income, and Also Patient Treatment Costs, to increase compliance in taking Tuberculosis medication.

METHOD

This type of research is a study using a Cross Sectional Study approach. The population of this study was all tuberculosis patients with farmer worker status recorded in patient registration at 6 health centers, namely Tirawuta Health Center, Tinondo Health Center, Lalolae Health Center, Mowewe Health Center, Sanggona Health Center, and Ueesi Health Center. With a population of 59 spread across 6 health center work areas where the study will be conducted. The sample in this study used the total sample technique where the sample was the entire total population (Syapitri et.al., 2021). So the number of samples in this study was 59 people within one month.

Data collection through observation, questionnaires and interviews. Furthermore, the data obtained were processed and presented in univariate, bivariate, and multivariate. The Chi Square test was applied to see the relationship between variables, analyzed with the help of SPSS 20.0 with a p-value <0.05. Multiple logistic regression tests were conducted to determine what factors were most dominantly related to compliance with taking pulmonary tuberculosis medication in East Kolaka Regency by looking at the Odds Ratio for each variable.

RESULTS

Table 1. Frequency distribution of respondents based on research variables

Variables	Amount	Percentage (%)
Knowledge		
Enough	15	25.4
Less	44	74.6
Family Support		
Good	10	16.9
Less	49	83.1
Role of Health Wolkers		
Good	48	81.4
Less	11	18.6
Stigma		
Good	34	57.6
Bad	25	42.4
Access to Health Facilities		
Easy	22	37.3
Difficult	37	62.7
Income		
High	22	37.3
Low	37	62.7
Cost of Treatment		
Able	8	13.6
Unable	51	86.4
Compliance		
High	0	0
Medium	18	30.5
Low	41	69.5



Based on Table 1, Shows That the results of 59 respondents of tuberculosis patients. showed the results of some respondents with insufficient knowledge amounting to 44 people (74.6%) and Sufficient Knowledge amounting to 15 people (25.4%), the majority of families are less supportive amounting to 49 people (83%) and families with Good Support amounting to 10 people (16.9%). The majority of the Role of Health Workers is good amounting to 48 people (18%) and the Role of Health Workers is Less Good amounting to 11 people (18.6%), Some Respondents with Good Stigma amounting to 34 people (57.6%) and Bad Stigma amounting to 25 people (42.4%), showing the results of Most Patient Access to Health Facilities is Difficult to Reach amounting to 37 People (62.7%). Access to Health Facilities is easy to reach amounting to 22 people (37.3%), Some respondents with Low Income amounting to 37 People (62.7%) and High Income amounting to 22 people (37.3%). The majority of patients who cannot afford medical expenses are 51 people (86.4%), those who can afford medical expenses are 8 people (13.6%), the majority of patients with low compliance are 41 people (69.5%) and those with moderate compliance are 18 people (30.5%).

Table 2. Analysis of the Relationship between Knowledge, Family Support, Role of Health Workers, Stigma, Access, Income, and Stigma on Compliance in Taking Pulmonary Tuberculosis Medication in East Kolaka Regency.

Variable	compliance				P-value
	Low		Medium		
	n	%	n	%	
Knowledge					
Enough	35	79.5	9	20.5	0,004
Less	6	40	9	60	
Family Support					
Good	40	81.6	9	18.4	0,000
Less	1	10	9	90	
Role of Health Wolkers					
Good	9	81.8	2	18.2	0,325
Less	32	66.7	16	33.3	
Stigma					
Good	22	88	3	12	0,008
Bad	19	55.9	15	44.10	
Access to Health Facilities					
Easy	35	94.6	2	5.4	0,000
Difficult	6	27.3	16	72.7	
Income					
High	10	45.5	12	54.5	0,002
Low	31	83.8	6	16.2	
Cost of Treatment					
Able	39	76.5	12	23.5	0,003
Unable	2	25	6	75	

Based on Table 2, it shows that the knowledge of pulmonary tuberculosis patients is related to compliance in taking tuberculosis medication, this is evidenced by a p value <0.05, namely (0.004), family support for pulmonary tuberculosis patients is related to compliance in taking tuberculosis medication, this is evidenced by a p value <0.05, namely (0.000), the role of health workers for pulmonary tuberculosis patients does not have a relationship with compliance in taking tuberculosis medication, this is evidenced by a p value >0.05, namely (0.325), the stigma of pulmonary tuberculosis patients is related to compliance in taking tuberculosis medication, this is evidenced by a p value <0.05, namely (0.008), access to health facilities for pulmonary tuberculosis patients is



related to compliance in taking tuberculosis medication, this is evidenced by a p value <0.05, namely (0.000), income for pulmonary tuberculosis patients is related to compliance in taking tuberculosis medication, this is evidenced by a p value <0.05, namely (0.002), The cost of treatment for pulmonary tuberculosis patients has no relationship with compliance in taking tuberculosis medication. This is proven by the p value <0.05, namely (0.003).

Table 3. Results of the Multivariate Analysis Test of Multiple Logistic Regression Test

Testing Stages	Variable	B	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Stage 1	Knowledge	-0.348	0.800	0.706	0.048	10.454
	Family Support	2.088	0.141	8.07	0.5	130.224
	Stigma	1.128	0.325	3.091	0.326	29.27
	Access	3.516	0.004	33.652	3.159	358.514
	Income	1.214	0.3	3.366	0.339	33.378
Stage 2	Medical Costs	1.957	0.266	7.077	0.225	222.881
	Family Support	2.014	0.147	7.497	0.494	113.814
	Stigma	1.011	0.331	2.748	0.358	21.117
	Access	3.503	0.004	33.202	3.145	350.519
	Income	1.14	0.313	3.126	0.341	28.681
Stage 3	Medical Costs	1.877	0.288	6.533	0.206	207.634
	Family Support	2.428	0.064	11.336	0.872	147.352
	Access	3.468	0.003	32.074	3.209	320.54
	Income	1.47	0.172	4.348	0.527	35.874
Stage 4	Medical Expenses	1.571	0.304	4.81	0.241	96.076
	Family Support	2.915	0.02	18.452	1.587	214.534
	Access	3.128	0.002	22.818	3.159	164.841
	Income	1.918	0.051	6.806	0.989	46.864

Based on table 3. Results of the Multiple Logistic Regression Multivariate Test Showing the results In the first step the independent variable Knowledge was removed because the p value > α (0.25 > 0.800), In the second step the independent variable stigma was removed because the p value > α (0.25 > 0.331), In the third step the independent variable Medical Costs were removed because the p value > α (0.25 > 0.304).

The variable Access to Health Facilities that are difficult to reach has a risk of compliance 22.818 times greater than the number of tuberculosis patients who have low compliance compared to access to health facilities that are easy to reach where the P-Value is 0.002 <0.05 which means there is a relationship between access to health facilities and compliance with taking pulmonary tuberculosis medication in farmers in East Kolaka Regency in 2024 with a value (95% CI 3.159 - 164.841).

Poor patient family support has a risk of 18.452 times greater adherence to medication, there are a number of patients who have low adherence compared to the cost of treatment for patients who can afford it, where the P-Value is 0.020 <0.05, which means there is a relationship between family support and adherence to taking pulmonary tuberculosis medication in farmers in East Kolaka Regency in 2024 with a value (95% CI 1.587 - 214.534). Multivariate Test Results of Access to Health Facilities Variables on adherence to taking pulmonary tuberculosis medication in East Kolaka Regency showed related results where the p-value <0.05, namely 0.002.



DISCUSSION

Relationship between Knowledge and Taking Pulmonary Tuberculosis Medication in East Kolaka Regency.

Knowledge is a fact, truth or information obtained through experience of an object (Notoatmodjo., 2004). According to Notoatmodjo in Naomi (2019), knowledge is the result of "knowing" and this occurs after people sense a particular object.

The results of the univariate test showed that the majority had insufficient knowledge about pulmonary tuberculosis, respondents with insufficient knowledge numbered 44 people (74.6%). The results of the bivariate statistical test showed that there was a significant relationship between knowledge and compliance with taking pulmonary tuberculosis medication in East Kolaka Regency in 2024. Knowledge of Pulmonary Tuberculosis Patients has a relationship with compliance with taking tuberculosis medication, this is evidenced by the p value <0.05 , namely (0.004). The results of this finding are in accordance with the theory put forward by Notoatmodjo that a person's actions towards a health problem can be influenced by their knowledge about the problem. This knowledge can be a motivation for someone to change their attitude and behavior.

The better the level of knowledge of a patient, the better the patient's compliance in taking medication will be, conversely, the lower the patient's knowledge, the lower the compliance in taking medication will be.. (Barza et.al., 2021). Similar results were also found by Hasina in 2023, where the research conducted revealed that the level of knowledge had a significant relationship with compliance in taking anti-tuberculosis drugs. Respondents who had a high level of knowledge tended to be compliant in taking anti-tuberculosis drugs, and vice versa, those with less knowledge tended to be non-compliant in taking medication. (Hasina et.al., 2023). This study is also in line with the research conducted by Lili et al., where the study revealed that there is an influence of knowledge on medication adherence in pulmonary tuberculosis patients. Knowledge is one of the risk factors that influences the results of the study on medication adherence in pulmonary tuberculosis patients (Fitri, 2018).

Relationship of Family Support with Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

The family is the closest environment to the patient. Families interact with each other in everyday life. Thus, changes in interactions that occur in the family of pulmonary TB patients can affect the feelings or psychology of the patient.(Ariani, 2019). The role of the family as a drug-taking supervisor is direct supervision to ensure regularity of treatment. (Omega et.al., 2021)

The results of the univariate test that has been conducted show that the majority of pulmonary tuberculosis patients in the six health centers studied receive less support from their families. The results of the majority of families with less support are 49 people (83%) and families with good support are 10 people (16.9%). The results of the Chi-Square statistical test show that there is a significant relationship between family support and adherence to taking tuberculosis medication in East Kolaka Regency in 2024 where family support for pulmonary tuberculosis patients has a relationship with adherence to taking tuberculosis medication, this is evidenced by the p value <0.05 , namely (0.000).

This research is also supported by research conducted by Ulfah et al. in 2016 where family support factors were related to compliance with pulmonary TB treatment at the Cipunagara Health Center (Ulfah et.al., 2018). This research is also supported by research conducted by Ulfah et al. in 2016 where family support factors were related to compliance with pulmonary TB treatment at the Cipunagara Health Center(Omega, et.al., 2021).

From the results, it was found that the patient's family was less supportive in implementing medication adherence for tuberculosis patients, this was due to several factors including the communication response from the family regarding the patient's illness, the patient's family did not know about tuberculosis and also the patient's family still never asked about the health development of the tuberculosis patient.

Relationship of Support Role of Health Workers Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

Health Workers are all people who dedicate themselves to the health sector and have a professional attitude, knowledge, and skills through higher education which for certain types require the authority to carry out health efforts.(Kemenkes RI, 2023).

The results of the univariate test that has been carried out show that the majority of pulmonary tuberculosis patients in the six health centers studied received the role of health workers in compliance with taking pulmonary tuberculosis medication, getting a good active role with a total of 48 people (81.4%). The results of the Chi-Square statistical test showed that there was no significant relationship between the role of health workers and compliance with taking tuberculosis medication in the scope of the East Kolaka Regency Health Service in 2024, this is evidenced by the p value > 0.05 (0.325). This study is also supported by research that has



been conducted by Dadang in Tasikmalaya City in 2022, in the study that the role of health workers was not related to compliance with taking tuberculosis medication (Dadang, 2023).

This research is supported by Asriati et al., who stated that the role of TB specialist officers in fulfilling the treatment needs of patients was stated as sufficient by the majority of respondents who were not compliant. This proves that there are other factors that cause respondents to remain non-compliant with treatment even though the role of officers is sufficient. (Asriati and Alifariki, 2020)

TB treatment will cure most patients without triggering the emergence of resistant germs or immunity to TB drugs taken by patients. In order to achieve this, it is very important to ensure that TB patients swallow all the drugs given according to existing recommendations with the role of good health workers. Up to this stage, the role of tuberculosis health workers cannot be ignored either because it is one of the determinants of successful compliance in taking medication. Thus, according to the author as a health worker on duty at a health facility, it is an important task to always provide health information and counseling to tuberculosis patients in an effort to successfully take medication.

Relationship of Stigma with Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

Stigma and discrimination against tuberculosis sufferers arise in relation to ignorance about the mechanism of tuberculosis transmission. Excessive estimates of the risk of infection through casual contact and negative attitudes (Hariadi et.al., 2023).

The results of the univariate test that has been conducted show that the majority of pulmonary tuberculosis patients in the six health centers studied that the stigma in pulmonary tuberculosis disease is considered good where the results of good stigma are 34 people (57.6%) and bad stigma 25 people (42.4%). The results of the Chi-Square statistical test show that there is a significant relationship between the stigma obtained by tuberculosis patients and compliance with taking tuberculosis medication in farmers within the scope of the East Kolaka District Health Office in 2024, this is evidenced by the p value <0.05 (0.008).

The results of this study are in accordance with the theory put forward by Rima that inappropriate stigma around health problems in the community related to tuberculosis leads to the perception of stigma. The perception of stigma that is not good for the community gives rise to personal perceptions or self-stigma when experiencing community stigma which affects compliance with TB treatment (Setiawati et al., 2022)

The research conducted is similar to the results conducted by Cucu Herawati in the UPT Puskesmas Kejaksaan Kota Cirebon area in 2019, where the results of the study showed that there was a relationship between perceived stigma and compliance with taking medication (Herawati et.al., 2020).

Research conducted that. Inappropriate stigma around health problems in the community related to tuberculosis leads to stigma perception. The perception of stigma that is not good for the community creates personal perception or self-stigma when experiencing community stigma that affects TB treatment compliance. Therefore, the importance of intrapersonal communication between patients with their families and health workers to overcome problems in themselves. such as assumptions or perceptions related to the disease they suffer from, this greatly affects if the perceived stigma in patients is very high because it can have a negative effect on the process of drug adherence. In general, the stigma obtained by tuberculosis patients in the work area of the East Kolaka Regency Health Service has an impact on drug adherence, including the bad social stigma obtained by tuberculosis patients.

Relationship between Access to Health Facilities and Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

Health services have a significant relationship with compliance with tuberculosis treatment, therefore access to health services must be good, meaning that health services are not hindered by geographical, social, economic, cultural, organizational or other obstacles. (Yulisetyaningrum et.al., 2019)

Good health care is health care that is found in rural areas. Access to health care must be good, meaning that health care is not hindered by geographical, social, economic, cultural, organizational or language barriers. Geographical access can be measured by the type of transportation, distance, travel time and other physical barriers that may prevent someone from obtaining health care. (Wiyono, 2008)

The results of the univariate test that has been carried out show that the majority of pulmonary tuberculosis patients in the six health centers studied that access to health facilities is considered difficult to reach where 37 people (62.7%) stated this. The results of the



Chi-Square statistical test show that there is a significant relationship between access to health facilities for tuberculosis patients and compliance with taking tuberculosis medication among farmers within the scope of the East Kolaka Regency Health Service in 2024, this is evidenced by a p value <0.05 (0.00) This study is supported by research conducted by Mujamil in Kendari City in 2021 which found that access to health services has a relationship with compliance with taking tuberculosis medication (Mujamil, 2021)

This study is also supported by research conducted by Nurdin in South Sumatra Province in 2022, which found that there was a significant relationship between access to health facilities and medication adherence. Based on the results of the study, it was found that TB respondents who had difficult access to health facilities had a greater risk of developing MDR TB than TB respondents with easy access to Health Service Facilities (Nurdin, 2020). Access to health services for tuberculosis patients greatly affects compliance with taking tuberculosis medication, this is where the geographical location of the six research sites has access to health services that are very difficult to reach. Access from the patient's home to the health facility located in East Kolaka Regency causes patients to have limitations in complying with taking tuberculosis medication, in addition, there is no public transportation aspect at all, and the road infrastructure aspect is inadequate for two-wheeled or four-wheeled vehicles. Road access to the community health service center needs to be supported so as not to make it difficult for tuberculosis patients to always comply with the time in taking tuberculosis medication

Relationship between Income and Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

A decrease in income can cause a lack of purchasing power to meet food consumption so that it will affect nutritional status. If the nutritional status is poor, it will cause the body's immunity to decrease, making it easier to get pulmonary TB infection (Saintika, 2014).

The results of the univariate test that has been conducted show that the majority of pulmonary tuberculosis patients in the six health centers studied that the level of income of pulmonary tuberculosis patients is low in accordance with the Southeast Sulawesi governor's regulation concerning the Provincial Minimum Wage where low income is 37 people (62.7%). The results of the Chi-Square statistical test show that there is a significant relationship between the level of income obtained by tuberculosis patients and compliance with taking tuberculosis medication in the scope of the East Kolaka Regency Health Service in 2024, this is evidenced by the p value <0.05 (0.002). From previous research conducted by Nike et al at the Putri Ayu Health Center in 2022, it was found that from the results of statistical analysis data, income has a significant relationship with compliance with drug use. People with low incomes also have a high level of compliance with drug use.

The results of this study are in accordance with the research theory of Papeo that income plays a role in supporting the needs of life, income will affect the physical, mental and social aspects of patients. Patients with low incomes are aware of having the highest level of compliance because they are aware that impaired health can interfere with the amount of income they earn so that there is self-awareness to comply. (Papeo et.al., 2021). This study is also supported by research conducted by Erni Erawatyningsih in 2019 that found a very significant relationship between family income and non-compliance with treatment in patients with pulmonary TB. Very low family income can determine non-compliance with treatment in patients (Ernawatyningsih et.al., 2019).

The most TB patients are low-income people, so in the treatment of TB, in addition to their income to meet their daily basic needs, they still have to spend transportation costs to seek treatment at the Health Center. This is what causes low-income patients to be non-compliant in treatment and claim that they have no money to seek treatment at the Health Center. The socio-economic factors of patients play a role as a risk factor for the low willingness of patients to seek health services because the average income of TB patients is still low from the per capita income of the population. On the other hand, socio-economics affects the ability to finance health services because they are still focused on their basic needs. In general, the income of tuberculosis patients is below the UMP of Southeast Sulawesi at, This is because the work of tuberculosis patients is only farmers who depend on income from the harvest season. Especially when the dry season arrives as additional income from government assistance funds.

Relationship between Medical Costs and Taking Pulmonary Tuberculosis Medication in East Kolaka Regency

Healthcare costs are the amount of funds that must be provided to organize and/or utilize various health efforts needed by individuals, families, groups and communities. In other words, if someone is able to pay for health care, they will get the health services they need (Asriati & Alifariki, 2020). And medical expenses other than health costs borne by the government.



According to Sari et.al, the amount of other drug costs needs to be further examined to see whether the drug really needs to be given or not. In this case, drug cost control is needed by setting drug standards that must be used for TB therapy. Furthermore, indirect costs are costs that arise but are not directly related to the therapy being carried out.(Diana Sari et.al., 2017)

The results of the univariate test that has been carried out show that the majority of pulmonary tuberculosis patients in the six health centers studied that the cost of treatment for tuberculosis patients to be able to comply with undergoing tuberculosis treatment is partly unable where the cost of treatment for patients who cannot afford is 51 people (86.4%). The results of the Chi-Square statistical test show that there is a significant relationship between the ability to pay for tuberculosis patients' treatment and compliance with taking tuberculosis medication among farmers in the East Kolaka Regency Health Service in 2024, this is evidenced by the p value <0.05 (0.003)

This study does not match the research that has been conducted by Mujamil in Kendari City in 2021, from this study it was found that there was no very significant relationship between the cost of treatment and compliance with taking pulmonary tuberculosis medication in Kendari City. According to the 2021 Mujamil Research in Kendari City, in general, respondents were unable to pay for TB treatment, namely that respondents were not able to pay for nutritious food and drink to support TB recovery with a percentage of 63.2%. Tuberculosis Treatment Costs are costs that have been borne by the central government through the national tuberculosis control program, but do not require the possibility that there are indirect costs that must be incurred by tuberculosis patients with the condition of the area of the distance from the patient's home to the health service center which requires time and special vehicles so that additional costs are required, and also require good nutritional intake during the treatment period to be completed. This is directly proportional to the income of tuberculosis patients who are lacking with additional medical costs making . if the patient's income is high, the cost of treatment can be met, and vice versa if the patient's income is low, the cost of treatment cannot be met

CONCLUSION

The results of this study indicate that access to health facilities, family support, and income are dominantly related to compliance in taking Anti-Tuberculosis Drugs in six Public Health Centers within the scope of the East Kolaka District Health Office.

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