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Factors Influencing the Discovery of Suspected Tuberculosis during the COVID-19 Pandemic in Palu City

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Abstract
This study aimed to analyze the factors that influence the discovery of suspected tuberculosis during the COVID-19 pandemic in Palu City with a type of cross-sectional study. The type of research used was quantitative, with an analytic epidemiological study design using a cross-sectional design. This research was carried out in 13 working areas of the Puskesmas in Palu City from January to March 2022. The population in this study were all suspected tuberculosis at 13 Community Public Health (in Indonesia: Puskesmas) in Palu City in 2021, recorded at the Tuberculosis Information System totaling 15,620 people using the slovin formula to obtain a sample of 100 and the sampling design used stratified random sampling. This study used the T-test with α=10%. The results show that most of the respondents had less knowledge of 69 respondents (69%), respondents had a low stigma of 70 respondents (70%), 73 respondents (73%) received adequate tuberculosis services, 19 respondents (19%) received good services, and 8 respondents received less services, with a percentage of 8%. A significant effect between knowledge of suspected tuberculosis (p = 0.000), stigma (p = 0.000), and tuberculosis services (p = 0.000) on the discovery of suspected tuberculosis during the COVID-19 pandemic in Palu City. It is recommended to increase tuberculosis tracking during the COVID-19 pandemic conditions and conduct training to improve and optimize the role of tuberculosis cadres in the working area of each Public Health Center.

Keywords: Suspected Tuberculosis, COVID-19, Knowledge, Stigma

Key Messages:

- The health center has provided promotive and preventive services to visitors. Community Health Centers can improve tracking of suspected tuberculosis during the current pandemic and conduct training to improve and optimize the role of tuberculosis cadres in each working area of the Health Center

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1. Introduction

Tuberculosis is an infectious disease that attacks the lungs or other organs caused by *Mycobacterium tuberculosis*, an Acid Resistant Bacteria (ARB) (1). Tuberculosis is one of the top ten causes of death in the world. The World Health Organization (WHO) in 2019 reported that 7 million people worldwide were diagnosed with tuberculosis. Every year, 1.4 million people die from tuberculosis, meaning that around 4,000 people die every day. There are several countries on the Asian Continent with the highest incidence of cases, namely India is currently ranked first with the highest number of tuberculosis sufferers in the world with 2,640,000 cases, Indonesia with

845,000 cases, and China with 833,000 cases (2).

WHO reported the COVID-19 pandemic has resulted in a 50% reduction in the TB Case Detection Rate (CDR). COVID-19 is a Public Health Emergency of International Concern (PHEIC) or a World Concerned Public Health Emergency (WCPHE), resulting in a significant reduction in the reporting and monitoring of tuberculosis during a pandemic. Health sector resources are used to deal with COVID-19 and significantly impact case detection (3,4). According to the Ministry of Health of Indonesia, in 2019, Indonesia had an increase in tuberculosis cases from 2017 to 2018 by 28%, and in 2019, tuberculosis sufferers were 543,874 cases and CDR 64.5%; it declined compared to 2018 (a total of 566,623 cases and CDR of 67.2%). The CDR in 2019 has increased compared to the previous 10 years, but the CDR has not achieved the target of >90%, a WHO's recommendation (1,5). Based on data from the Central Sulawesi Provincial Health Office, the CDR for tuberculosis in Central Sulawesi fluctuates and tends to increase in 2017 (40%), 2018 (59%), and 2019 (66%), while the CDR in 2020 was 38%. This shows that there has been a decrease in CDR in Central Sulawesi, which is the pandemic's impact on tuberculosis control and management at all levels (3,4).

The CDR for tuberculosis in Palu City in 2017 was 52%; in 2018 was 49.4%; in 2019 was 51.08%; while in 2020 was 26%. The decline in case of detection in 2020 due to the COVID-19 pandemic has made tuberculosis sufferers worried about being infected and afraid of being declared COVID-19, so people who experience signs and symptoms of tuberculosis are reluctant to go to healthcare facilities (3,4). The national target for tuberculosis case detection has not been achieved, and there has been a significant decrease in CDR in Palu City in 2020 and 2021. The discovery of tuberculosis cases that have not met the target is a factor causing high tuberculosis cases in the community. Therefore, researchers are interested in researching related findings of suspected tuberculosis during this pandemic by knowing the factors that influenced the discovery of suspected tuberculosis in Palu City. Activities in the tuberculosis eradication program by making efforts to find sufferers early. The low finding of tuberculosis cases results in delays in establishing the diagnosis of tuberculosis, so there are still many tuberculosis sufferers who have not been found.

Based on a preliminary study conducted by researchers, it is known that most of the Puskesmas in Palu City have experienced a decrease in the detection of tuberculosis cases due to the pandemic making tuberculosis suspects reluctant to go to health facilities to have their health checked. A tuberculosis suspect is suspected of having tuberculosis with initial symptoms of cough with phlegm >2 weeks or more with the presence or absence of additional symptoms. The low finding of suspected tuberculosis due to insufficient knowledge can hinder the detection of suspected tuberculosis. Lack of knowledge will cause sufferers with long-standing cough symptoms and other clinical symptoms not to know the possibility of what disease they are experiencing, so sufferers do not check their health (Prihanti et al., 2018).

Tuberculosis has an impact not only economically detrimental but also on social stigma and even ostracism in society. Stigma does not only come from the community or family but from the sufferer himself. Stigma is fixated on public health problems with negative characteristics attached to a person's personality due to environmental influences. Stigma and fear of COVID-19 infection make tuberculosis sufferers not want to visit tuberculosis services (6). The Global Fund report regarding tuberculosis services during the COVID-19 pandemic that 80% of tuberculosis programs supported globally have experienced disruptions in service delivery. Tuberculosis services are directly affected during this pandemic. Disruption in tuberculosis services will result in delays in diagnosis, interruption of treatment, and subsequent tuberculosis burden, leading to increased morbidity, mortality, transmission, and rates of drug resistance (7).

This study aims to analyze the factors that influence the detection of suspected tuberculosis during the COVID-19 pandemic in Palu City.

2. Methods

.The type of research used was quantitative, with an analytic epidemiological study design using a cross-sectional design. This research was carried out in 13 working areas of the Puskesmas in Palu City from January to March 2022. The population in this study were all suspected tuberculosis at 13 Community Public Health (in Indonesia: Puskesmas) in Palu City in 2021, recorded at the Tuberculosis Information System totaling 15,620 people using the slovin formula to obtain a sample of 100 and the sampling design used stratified random sampling.

The independent variables that will be examined are knowledge, stigma, and tuberculosis services. While the discovery of suspected tuberculosis as the dependent variable. Knowledge of suspected tuberculosis related to information on tuberculosis and COVID-19 which is understood regarding the dangers, transmission, symptoms, treatment and diagnostics of tuberculosis during a pandemic. Knowledge is measured using 20 questions on a questionnaire using a Likert scale. The value obtained from the score of the questionnaire regarding knowledge of tuberculosis and COVID-19 is distributed to respondents with a maximum score of 2 and a minimum score of 0. Stigma regarding respondents' concerns, feelings of shame and perspectives related to tuberculosis during the COVID-19 pandemic. Stigma was measured with 14 questions on the questionnaire using a Likert scale, and the value of how stigmatized a person was against tuberculosis during the COVID-19 pandemic was obtained. The readiness of health workers as tuberculosis service providers in providing services includes visitor comfort, waiting time, availability of drugs, presence of officers and provision of information related to tuberculosis during the COVID-19 pandemic. How to measure tuberculosis services using a questionnaire calculated using a Likert scale of 10 questions. The number of tuberculosis suspects found by the Puskesmas during 2021. A tuberculosis suspect is someone who is suspected of having tuberculosis with the initial symptom of coughing up phlegm for >2 weeks or more with the presence or absence of additional symptoms. Not suspected tuberculosis If the respondent does not experience initial symptoms of cough with phlegm > 2 weeks or more whether or not additional symptoms are present.

Bivariate analysis is used to determine the magnitude of the relationship between the dependent variable and the independent variable. Bivariate analysis was performed to provide evidence for the hypothesis with a T test.

3. Results

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Table 1. Distribution of Respondents Based on Characteristics

Characteristics	n	%
Gender		
Male	47	47
Female	53	53
Occupation		
Civil servant	5	5
Housewive	34	34
Farmer	2	2
Student	11	11
Self-employed	25	25
Laborer	14	14
Private/honorary employee	5	5
Unemployed	4	4
Age (y.o)		
<20	8	8
21-30	13	13
31-40	27	27
41-50	25	25
>51	27	27
Total	**100**	**100**

Source: Primary data, 2022

Table 1 shows the distribution of respondents based on gender. Female was 53 people with a percentage of 53%, and male was 47 people with a percentage of 47%. The distribution of respondents based on occupation. The highest was Housewive (34 people) with a percentage of 34%, and the lowest was farmers (2 people) with a percentage of 2%. The highest age group of respondents aged 31-40 years and > 51 years were 27 people with a percentage of 27%; while for the lowest age group, aged <20 years, there were 8 people with a percentage of 8%.

Table 2 shows that most of the respondents had less knowledge of 69 respondents (69%), while the

respondents with good knowledge were 31 respondents (31%). Respondents had a low stigma of 70 respondents (70%), while respondents with a high stigma of 30 respondents had a percentage of 30%. 73 respondents (73%) received adequate tuberculosis services, 19 respondents (19%) received good services, and 8 respondents received less services, with a percentage of 8%.

Table 2 Distribution of Respondents based on Knowledge, Stigma, Tuberculosis Services

Knowledge of TB Suspects	**n**	**%**
Sufficient	31	31
Insufficient	69	69
Stigma		
Low	70	70
High	30	30
Tuberculosis Services	**n**	**%**
Less	8	8
Adequate	73	73
Good	19	19
Total	**100**	**100**

Source: Primary data, 2022

Table 3 The Effect of Knowledge, Stigma, Tuberculosis Services on the Discovery of Tuberculosis Suspects in Palu City

Variable	n	%	T_{count}	*Sig. (2-tailed)*
Knowledge				
Good	31	31		
Less	69	69	15.697	.000
Stigma				
Low	70	70	15.924	.000
High	30	30		
Tuberculosis Services				
Less	8	8	15.540	.000
Adequate	73	73		
Good	19	19		
Total	100	100		

Source: Primary data, 2022

Based on Table 3, the analysis results have been obtained; the analysis of knowledge Tcount 15.697 with Ttable was n = 96 of 0.1671, and the sig value of knowledge was 0.000 with a significant criterion of 0.05. The knowledge variable has a significant effect on the variable of suspected tuberculosis detection in Palu City. The analysis results show that the stigma analysis results were Tcount 15.924 with T table was n = 96 of 0.1671 and the sig value of the stigma was 0.000 with a significant criterion of 0.05. The stigma variable has a significant effect on the variable of suspected tuberculosis detection in Palu City. The analysis of tuberculosis services was Tcount 15.540 with Ttable was n = 96 of 0.1671, and the sig value of tuberculosis services was 0.000 with a significant criterion of 0.05. The tuberculosis service variable has a significant effect on the tuberculosis suspect detection variable in Palu City.

4. Discussion

The Effect of Knowledge on the Discovery of Suspected Tuberculosis during the COVID-19 Pandemic in Palu City

Knowledge of suspects about COVID-19 and tuberculosis will influence case finding, and knowledge has a major role in determining individual behavior, which is a realm in forming something to be done. The initial emergence of COVID-19 is something new, and there is still much that is unknown, creating fear of the unknown. Knowledge affects the detection of tuberculosis cases seen from the initial symptoms experienced and the ways of

transmission of tuberculosis (8). The results of the univariate analysis showed that out of 100 respondents (100%), most of them had less knowledge, as many as 69 people (69%), while respondents with good knowledge of 31 people (31%). It was known that 47 respondents were male: 14 people had good knowledge, and 33 other people had less knowledge. Meanwhile, the female had a total of 53 people, about 17 had good knowledge, and 36 had less knowledge. This analysis's results align with research conducted in Adama City, East Ethiopia, which found that gender and lack of knowledge about tuberculosis contributed to delays in seeking treatment for suspected tuberculosis (9). Women have more opportunities to visit health services when experiencing signs and symptoms of tuberculosis; most respondents are women and work as housewives who have more time to find out and discuss health problems compared to males; therefore, the level of knowledge in each individual is different.

The research results show that most of the respondents have less knowledge. Based on the contents of the questionnaire, it was known that the respondents did not know that tuberculosis was a dangerous disease. These results align with research conducted by the North Sumatra Bappeda which found that some people think tuberculosis is a disease that is not dangerous and is common (10). Tuberculosis and COVID-19 have the dominant symptom, namely coughing (11). Knowledge of suspects during the COVID-19 pandemic influenced because information about COVID-19 had been widely reported, and education was continuously carried out; this is evidenced by the results of research that several tuberculosis suspects had adequate knowledge about COVID-19 due to information obtained through television or media social media. Respondents know the signs and symptoms of COVID-19, while knowledge about tuberculosis is inadequate, so most respondents if they experience cough symptoms for more than two weeks, prefer not to have their health checked or do not know whether to go to a health service to check themselves. This is following research conducted by Clements JM (2020) (12) that research conducted in the United States showed knowledge related to COVID-19 more than half of the respondents answered correctly with a percentage of 80% and research conducted by Purnamasari et al (2020) (13) shows that the knowledge of the Wonosobo community about COVID-19 is ranked high.

Tuberculosis became a public health problem with the entry of COVID-19 and spread widely in various countries, especially Indonesia, and quickly emerged in Palu City. This resulted in health services and related parties intensively carrying out tracing, tracing, and testing, then the emergence of information that was not clear the truth made some respondents reluctant to go to health facilities. Respondents knew that the signs and symptoms of COVID-19 were fever, dry cough, fatigue, and muscle aches, while some did not know the signs and symptoms of tuberculosis. Delays in finding cases for prompt diagnosis and treatment of tuberculosis were caused by low knowledge of tuberculosis from the community itself (14) (15). Low knowledge is one of the individual risk factors causing sufferers with a long cough (suspected of tuberculosis) not to realize what disease they are suffering from.

Some factors influence knowledge, such as age; the highest age group was 31-40 years and > 51 years (27 people) about 25 respondents aged > 51 years have less knowledge. Reliance on others to seek health services in old age influences delays in health checks. Other factors, such as type of work, most of the respondents' jobs were housewives, with 34 people, 23 of whom had less knowledge, and 11 people had good knowledge. Respondents who work as farmers, laborers, and unemployed have less knowledge compared to respondents who work as civil servants (5 people) have good knowledge. The work of farmers and laborers is more likely to delay self-examination (16). Work affects delays in seeking health services due to lack of awareness about tuberculosis which ultimately affects the search for health services; therefore, good knowledge will determine a person's attitudes and actions toward attending tuberculosis services.

Respondents' knowledge during the COVID-19 pandemic was relatively low regarding information about tuberculosis dangers, transmission, symptoms, treatment, and diagnostics of tuberculosis. Most tuberculosis suspects know more about COVID-19 due to a large amount of information obtained in various news media. Efforts to increase knowledge of suspected tuberculosis can be carried out by educating health workers. Education has a role in increasing individual knowledge. Tuberculosis suspects can also access information about tuberculosis and do proper research to increase knowledge and minimize stigma.

The Effect of Stigma on the Discovery of Tuberculosis Suspects During the COVID-19 Pandemic in Palu City

Stigma is a negative characteristic attached to an individual because of the influence of his environment. The sufferer feels afraid or embarrassed when it is known that he has tuberculosis which causes the sufferer to

cover up his illness. Based on the questionnaire, 30 respondents felt ashamed, sad, and hopeless about suffering from tuberculosis. The COVID-19 pandemic has created fear for tuberculosis suspects in healthcare facilities, so they do not want to visit tuberculosis services, and this has led to a decrease in tuberculosis case detection.

Delays in seeking care and diagnosis triggered by stigma lead to the spread of tuberculosis, resulting in an increased risk of transmission by household and community contacts (17). Furthermore, there are reports that more than 50% of tuberculosis patients experience stigma after being diagnosed (18). Therefore, stigma has a role. Based on the study results, 17 people of the male sex had a high stigma, while there were 13 women with a high stigma. This shows that there is more stigma in men than in women. The study's results also show that the respondent's family relationship is good. The family becomes an important support structure to protect against discrimination in the social environment. Trust in the family is a good relationship that can reflect family resilience in the face of stigma.

Stigma influenced tuberculosis suspects to visit health services due to the COVID-19 pandemic. Based on the contents of the questionnaire, it is known that during this pandemic, the respondents felt worried about touching strangers or touching something in a public place. Stigma influences a person to be able to visit health services and interact with health workers. This is in line with research conducted in Africa showing that patients with chronic coughs have doubts about seeking treatment due to the new stigma and fear associated with COVID-19 (19). Other factors also affect stigma, including respondents' knowledge; as many as 31 people with good knowledge and 29 people with low stigma. This shows that knowledge can reduce the stigma in the community related to tuberculosis during the COVID-19 pandemic. This study found that knowledge was relatively high, while the respondent's stigma was low. This is based on the contents of the questionnaire, and it is known that respondents were only reluctant to go to tuberculosis services for examination because the widespread transmission of COVID-19 made respondents prefer not to have themselves checked.

The stigma of respondents during the COVID-19 pandemic made people with signs and symptoms of tuberculosis not agree to go to health services to check themselves out because they were worried about touching something in a public place. The widespread transmission of COVID-19 made respondents reluctant to go to health facilities due to fear of being declared COVID-19. Based on the research results, it was found that respondents with a low stigma category did not want to visit health services. Tuberculosis services at the Puskesmas can provide information regarding tuberculosis management during a pandemic so that suspected tuberculosis can visit health services without worry. Counseling to provide education can work with sub-districts or heads of neighborhoods to include tuberculosis suspects in community activities, so they can socialize with other communities.

The Effect of Tuberculosis Services on the Discovery of Suspected Tuberculosis During the COVID-19 Pandemic in Palu City

The COVID-19 pandemic has significantly impacted health services at Puskesmas, especially tuberculosis services. This study shows an influence between tuberculosis services on detecting suspected tuberculosis. COVID-19 had an impact on tuberculosis treatment and diagnostic services in healthcare facilities lacking resources that were diverted to the management of COVID-19 handling and according to the contents of the questionnaire it was found that tuberculosis service workers were sometimes at the Community Health Center (Puskesmas) during the COVID-19 pandemic (20). The pandemic period did not make the reason for tuberculosis services to continue providing treatment to patients, as evidenced by the contents of the questionnaire regarding the availability of drugs during a pandemic that anti-tuberculosis drugs were always available when respondents visited tuberculosis services and tuberculosis service personnel usually provided information related to tuberculosis to respondents. Following the protocol for managing tuberculosis patients during the COVID-19 pandemic issued by the government, it is necessary to ensure that the procurement and supply of tuberculosis drugs and diagnostic facilities do not experience interruptions during the pandemic.

Other factors also affect respondents in tuberculosis services, such as the type of work; as many as 25 respondents who work as housewive have adequate services, and 7 people with good services. Housewives who work at home have time to visit health services and respondents who do not work; as many as 3 people get enough service and 1 person get good service. Meanwhile, 52 respondents with low stigma received good tuberculosis services and 15 respondents received sufficient tuberculosis services. Most of the Palu City Health Centers have

provided good tuberculosis services. This is evidenced by the respondents who had less knowledge also receiving adequate tuberculosis services, as many as 50 people and 11 people with good services. Tuberculosis services during the COVID-19 pandemic experienced a decline in tuberculosis case detection due to the stigma of suspected tuberculosis (21). Stigma affects tuberculosis services; based on the contents of the questionnaire related to stigma to visit health services if they experience signs and symptoms of tuberculosis, most respondents answered disagree. This is because respondents fear contracting COVID-19 if they are declared COVID-19 by healthcare workers, considering that the general symptoms of tuberculosis and COVID-19 have similarities. Respondents were worried about contracting COVID-19 when visiting a health service (22).

The research results show that most of the tuberculosis services during the COVID-19 pandemic were in the sufficient category. Efforts that can be improved to achieve good service are by providing sufficient time to discuss health problems to build communication between officers and visitors and adding health workers in the tuberculosis service section so that visiting patients are still served. The COVID-19 pandemic has made tuberculosis services usually provide information to visitors regarding the differences between COVID-19 and tuberculosis (23). This shows that the health center has provided promotive and preventive services to visitors. Community Health Centers can improve tracking of suspected tuberculosis during the current pandemic and conduct training to improve and optimize the role of tuberculosis cadres in each working area of the Health Center.

5. Conclusion

The results of the study showed that there was a significant influence between knowledge of suspected tuberculosis (p=0.000), stigma (p=0.000), and tuberculosis services (p=0.000) on the detection of suspected tuberculosis during the COVID-19 pandemic in Palu City. Community Health Centers in Palu City can improve tuberculosis tracking during the COVID-19 pandemic and conduct training to improve and optimize the role of tuberculosis cadres in each Community Health Center work area and be more active in conducting education to increase knowledge of suspected tuberculosis related to signs and symptoms of tuberculosis during the COVID-19 pandemic. In addition, tuberculosis service officers are expected to provide time for visitors to tuberculosis services to build communication and interaction between officers and visitors.

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Conflicts of Interest: The authors declare no conflict of interest.

References

1. Kemenkes RI. Infodatin Tuberkulosis. Kementerian Kesehatan RI. 2018;1–8.
2. Report C, Towards P, Declaration UNP, Tb FA, Targets TB. A Deadly Divide : TB Commitments vs . TB Realities Dedication. 2020;(November).
3. Sulteng DS. Dinkes Sulteng 2019. Dinas Kesehatan Sulawesi Tengah. 2019;1–222.
4. Chakaya J, Khan M, Ntoumi F, Aklillu E, Fatima R, Mwaba P, et al. Global Tuberculosis Report 2020 – Reflections on the Global TB burden, treatment and prevention efforts. International Journal of Infectious Diseases. 2021; 113 Suppl 1:4–9.
5. Kemenkes RI. Beban TBC. TB Indonesia. 2019;
6. Fei H, Yinyin X, Hui C, Ni W, Xin D, Wei C, et al. The Lancet Regional Health - Western Pacific The impact of the COVID-19 epidemic on tuberculosis control in China. The Lancet Regional Health - Western Pacific. 2020;3:100032.
7. Merzistya ENA, Adi MS, Sutiningsih D, Rahayu SR. The Quality Of Tuberculosis Services In Patients ' Perspectives : A Literature Review. 2021;9(1):67–81.
8. Prihanti GS, Sari NP, Pratiwi DA, Mabruukah LP, Sekarwangi DH, Firmansyah W, et al. Analisis Faktor Yang

Menghambat Penemuan Suspek Penderita Tuberkulosis di Puskesmas X. MAGNA MEDICA: Berkala Ilmiah Kedokteran dan Kesehatan. 2018;2(4):40.
9. Wondawek TM, Ali MM. Delay in treatment seeking and associated factors among suspected pulmonary tuberculosis patients in public health facilities of Adama town, eastern Ethiopia. BMC Public Health. 2019;19(1):1–7.
10. Lubis RA, Putri AD, Ginting T, Utara S. Pasien rawat jalan di puskesmas sei mencirim medan tahun 2020. jurnal keperawatan dan fisioterapi (JKF). 2020, 3(1), 13-20. https://doi.org/10.35451/jkf.v3i1.467;3(1).
11. Hopewell PC, Reichman LB, Castro KG. Parallels and mutual lessons in tuberculosis and covid-19 transmission, prevention, and control. Emerging Infectious Diseases. 2021;27(3):681–6.
12. Clements JM. Knowledge and Behaviors Toward COVID-19 Among US Residents During the Early Days of the Pandemic: Cross-Sectional Online Questionnaire. JMIR Public Health Surveill. 2020 May 8;6(2):e19161.
13. Purnamasari I, Raharyani A El. Tingkat Pengetahuan dan Perilaku Masyarakat Kabupaten Wonosobo Tentang COVID-19. Ilmu Kesehatan. 2020;
14. Sreeramareddy CT, Panduru KV, Menten J, Van den Ende J. Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature. BMC Infect Dis. 2009 Jun 11;9:91.
15. Arja A, Godana W, Hassen H, Bogale B. Patient delay and associated factors among tuberculosis patients in Gamo zone public health facilities, Southern Ethiopia: An institution-based cross-sectional study. PLOS ONE. 2021 Jul 30;16(7):e0255327.
16. Alema HB, Hailemariam SA, Misgina KH, Weldu MG, Gebregergis YS, Mekonen GK, et al. Health care seeking delay among pulmonary tuberculosis patients in North West zone of Tigrai region, North Ethiopia. BMC Infectious Diseases. 2019;19(1):1–8.
17. Ngamvithayapong-Yanai J, Luangjina S, Thawthong S, Bupachat S, Imsangaun W. Stigma against tuberculosis may hinder non-household contact investigation: a qualitative study in Thailand. Public Health Action. 2019 Mar 21;9(1):15–23.
18. Thomas BE, Stephen A. Tuberculosis related stigma in India: roadblocks and the way forward. Expert Review of Respiratory Medicine. 2021 Jul 3;15(7):859–61.
19. Togun T, Kampmann B, Stoker NG, Lipman M. Anticipating the impact of the COVID-19 pandemic on TB patients and TB control programmes. Annals of Clinical Microbiology and Antimicrobials. 2020;19(1):1–6.
20. Alene KA, Wagdi K, Clements ACA. Impact of the COVID-19 Pandemic on Tuberculosis Control: An Overview. Trop Med Infect Dis. 2020 Jul 24;5(3):123. doi: 10.3390/tropicalmed5030123.
21. Rodrigues I, Aguiar A, Migliori GB, Duarte R. Impact of the COVID-19 pandemic on tuberculosis services. Pulmonology. 2022 May 1;28(3):210–9.
22. Sahashi Y, Endo H, Sugimoto T, Nabeta T, Nishizaki K, Kikuchi A, et al. Worries and concerns among healthcare workers during the coronavirus 2019 pandemic: A web-based cross-sectional survey. Humanit Soc Sci Commun. 2021 Feb 4;8(1):1–8.
23. Revita NCT, Sukartini T, Makhfudli M, Acob JRU, Hasanudin H, Aini HN. The Impact of COVID-19 Pandemic on Tuberculosis Patient Treatment Adherence. Jurnal Respirasi. 2022 May 31;8(2):113–8.