

THE INNOVATION OF THE MINI TUBERCULOSIS SPUTUM EXAMINATION PROGRAM (MPIS-TB): A PILOT STUDY AT THE BANJARSENGON COMMUNITY HEALTH CENTER, JEMBER REGENCY

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ABSTRACT

During the Covid-19 pandemic, fear and anxiety of families of TB-positive patients increased, making it difficult for the sputum investigation program to take place. Dry cough, fear of being diagnosed with Covid-19, and feeling physically fit are obstacles in the screening process. The aim of the study was to compare the sputum pots between the control and intervention groups in the innovation of the Mini TB Sputum Examination Program (MPIS-TB) in the Banjarsengon Public Health Center, Jember Regency. Quasy experimental with post test on 2 group designs was used. This pilot study on 13 participants (6 different families) became group control and intervention. Quickcheck of Covid-19 on East Java Provincial Health Office and SRQ-29 were used as a tool to approach the community in understanding the differences within the diagnosis of TB and Covid-19. Effective cough therapy, chest physiotherapy, and simple inhalation for 3 consecutive days were also given to all participants to facilitate sputum production and release stimulation. The study results showed that 15,38% sputum pots were identified to be returned to the health center for laboratory analysis, 53,84% sputum pots returned intact (sealed sterile), and 30,76% sputum pots returned without sterile seals. The lack of return of sputum pots in 11 participants (84.6%) was due to several factors, namely dry cough, fear of being diagnosed with Covid-19, and the feeling of not suffering from TB symptoms. The implementation of the MPIS-TB Program Innovation was successful with a sputum return ratio in the intervention and control groups of 40%: 0%. Thus, in the future this program could be applied to the TB public health center program.

Keywords: Screening; Sputum Investigation; Tuberculosis

INTRODUCTION

Tuberculosis (TB) is a health problem for millions of people because it is the second cause of death in infectious diseases (Herda et al., 2018). TB patients in East Java Province in 2018 reached 54,863 people (Dinkes Jatim, 2018). Whereas in Jember, TB reached a total of 3,021 cases (Dinkes Jember, 2019). Banjarsengon, as a sub-district of Jember, also has a reasonably

high TB rate (56 cases were recorded from January-November 2020). This has increased by 12 since 2019 (Puskemas Banjarsengon, 2020). On the other hand, the Case Notification Rate (CNR) data actually decreased by 34.9 in 100,000 suspected TB, which indicates that the TB Sputum Investigation Program (PIS-TB) has had results but has not been optimized (Dinkes Jember, 2020) The increasing case

finding of TBC can be caused by low medication adherence, level of knowledge, and access to health facilities. It requires primary to tertiary prevention programs, one of which is contact investigation (Ratnasari et al., 2020; Ariyani, 2016; Prihantana et al., 2016)

The TB control program has changed the strategy of finding TB patients. It is not only "passively with the active promotion" but also through "intensive and massive active discovery based on family and community" while still paying attention to and maintaining quality services. One of the essential activities is contact tracing and contact investigation (Buntuan, 2014). This activity will be referred to as Contact Investigation (CI), a tracing and investigation activity for people who come into contact with TB patients to find TB suspects. So that case finding and prevention of transmission can be improved.

To increase TB patients CI coverage, a program was developed, namely the Mini Program Investigation Sputum - Tuberculosis (MPIS-TB). Unlike the previous program, MPIS-TB provides nursing aspects by providing effective cough training, chest physiotherapy, steam

therapy, Covid-19 confusion elimination approach through detection using *Self Reporting Questionnaire-29* (SRQ-29), Quick Check, and temperature measurement results.

The working system of MPIS-TB is like CI in general. Family members of TB patients are given a sputum pot to collect the laboratory's sputum for examination. Hopefully, the finding of new cases within the scope of the family can be increased and prevented. However, before this was done, the intervention was administered to family members of TB patients with the detection of SRQ-29 and Quick Check which were used to erase people's perceptions and fears of Covid-19 and measure body temperature. Then, effective cough training interventions, steam therapy, and chest physiotherapy are carried out in families with TB. If sputum is found, it will be immediately taken to the laboratory for examination.

MPIS-TB was tested in the intervention and control groups that expected more post sputum returns from the intervention group. The result that researchers expect from the MPIS-TB trial is that the entire sputum pot is given back and contains sputum for examination. It can be seen that there are

new cases of TB with household contacts in the community as a source of transmission. It is following the research objectives, which is to increase case finding and prevention of TB transmission in the community.

METHOD

This study used A Quasy experiment research with two groups: intervention and control group, and post-test design method with pilot study on 13 participants (6 family) selected using purposive sampling. This trial was needed to determine the feasibility of program innovation (Sugiyono, 2012). Determination of the sample was done by purposive sampling. The sample categories were those who do not do routine TB treatment and had history of TB drug withdrawal. Determination of control and intervention group was done randomly. Therapy was carried out for 30 minutes in the morning and evening for 3 days. Intervention group would be given effective cough, chest physiotherapy, and simple inhalation. Control group was not given any intervention. However, for the ethical aspect of justice, in the third therapy session, the control group was taught how to do effective cough, chest physiotherapy, and simple inhalation.

At the history-taking the stage, the Program Indonesia Sehat-Pendekatan Keluarga (PIS-PK) Form (Kementerian Kesehatan RI, 2016), Quick Check Covid-19 (Dinkes Jatim, 2019), and SRQ-29 (Keliat et al., 2020) were used for the community assessment measuring tools; while the therapy stage used Standard Operating Procedures (SOP) for effective cough, chest physiotherapy, and simple inhalation (Abdillah et al., 2016). The workflow and strategic steps for MPIS-TB were as follows (Figure 1, Table 1, and Table 2). The implementation of innovation program administratively got an ethical approval No. 5874/UN 25.1.14/SP/2020 from the Jember District Health Office and The Public Health Centers Banjarsengon.

RESULT

Evaluation of the whole Pot Sputum Control

The sputum investigation program was carried out on 7 families (13 participants), where their family members were positive for TB. Investigations were taken on family members who have not been examined for sputum. Of the 7 families, 1 family was dropping out due to the relocation of their residence, which was outside the work area of the Banjarsengon Community Health Center; 5 families were with family

members who were unable to spit out phlegm, and 1 family refused to have a sputum examination. 4 of the families who were investigated for sputum did not have cough symptoms, so it was challenging to produce sputum, and 1 family could not spit out phlegm even though they had a cough. Families in close contact with TB patients were given effective cough interventions, warm steam therapy, and chest physiotherapy to help sputum expectoration.

Of the 7 families given sputum pots, namely, Mr. P was given 5 pots and returned 5 pots without sputum. Mr. family S and Mr. B were given 2 pots of sputum and returned 2 pots without sputum. Mr. family H and Mr. Y were given 1 sputum pot and returned 1 pot without sputum. Mr. family B was given 2 pots of sputum and returned 2 pots of sputum. 15,38% sputum pots were identified to return to the health center for laboratory analysis, 53,84% sputum pots returned intact (sealed sterile), and 30,76% sputum pots returned without sterile seals. So it could be concluded that in the sputum investigation program with the Family-Centered Care (FCC) approach, the same number of initial sputum pots and final (return) sputum pots were found (Table 3).

Comparative Evaluation of Control and Intervention Groups

Of the 6 families who became research respondents, 3 families belonged to control group, and the next 3 families belonged to intervention group. All family members in close contact with the control and intervention groups were given a sputum pot to collect morning phlegm. According to Tabel 4, in the intervention group, 2 families who were given therapy could spit out sputum after routinely given treatment for 3 days. In the control group, respondents could not spit out sputum and refused to be examined because they were saturated with the treatment program.

DISCUSSION

Based on therapy, all respondents stated that their sputum could not come out before the intervention was carried out. Other studies said that several factors affect sputum expenditure in a person, namely education and age. Whether or not sputum is released is influenced by the patient's force when coughing because pushing the sputum out requires adequate expiration from the chest muscle wall, not from the back of the mouth or throat (Kasanah, 2015).

The intervention group could not get rid of the sputum, hence the intervention in the form of steam therapy with warm water, chest physiotherapy, and coughing was effective. The result is 2 out of 3 control group families can remove sputum. This is following other research where warm water vapor therapy with eucalyptus oil (steam inhaler aromatherapy) is proven to inhibit the spread of tuberculosis (TB) germs by more than 90% (Soyingbe et al., 2017). Research conducted by (Putri 2017) also said that steam inhalation therapy can thin out phlegm and help expel phlegm quickly.

The results obtained were Eucalyptus citriodora proven to inhibit the spread of pulmonary tuberculosis by more than 90%. Chest physiotherapy is one of the therapies that can help removing the secretions of percussion and vibration movements in the treatment. Vibration and percussion movements aim to move the secret in the bronchial wall to be pushed out. In this study, one of the respondents revealed an itching sensation in the throat and a feeling of wanting to cough after this intervention, but even so, the sputum still could not be excreted. Therapy is then continued, and the sputum can be removed on the third day of the intervention.

This is following the research, which states a difference in sputum expenditure between the control group and the intervention group after being given percussion and vibration techniques using the Chi-Square test with the results after being given percussion and vibration techniques the p-value = 0.004 ($p < 0.05$). This shows a significant difference between the control group and the intervention group on sputum expenditure in children under five at Indralaya Public Health Center (Dhona, 2020).

One respondent had been given intervention, but the sputum could not be excreted on the third day because he said the sputum could not come out. The inability to remove the sputum could be caused by several things such as secret production, airway obstruction, and the patient's condition. If one of the three factors occurs, the sputum released a small amount (Amos, 2018).

Another nonpharmacological therapy given to the intervention group was effective coughing. This method is useful in helping respondents clean secrets (Tarigan, 2019). Based on research by Lestari et al. (2020), after a statistical test was carried out using Wilcoxon, it was obtained that the P-value = 0.04 with a confidence value < 0.05 ,

which indicates that there is an effect between Effective Cough on Sputum Expenditures in Pulmonary Tuberculosis Patients. The results of a similar study also said that there was an effect between giving effective coughing techniques in sputum removal and the results of the Wilcoxon

signed-rank test statistical analysis where the Z value = -3.669 with p-value = 0.000 <0.05. Effective cough therapy is given following the theory of effective cough goals where cough can effectively clear secretions (Lestiana et al., 2020).

Table 2. MPIS-TB Plan of Action

No	Plan	1 st Week							2 nd Week							
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1.	Preparation (literature study)															
2.	Preparation of proposals															
3.	Creating a program flow															
4.	Coordination of PJ Programs, PJ Regions, and Cadres															
5.	Briefing program															
6.	Trials															
7.	Discussion of the results															
8.	Evaluation															
9.	Follow up plan															

Table 3. Evaluation of the turbidity of Sputum Pot

No.	Group	Family	Sputum Pot	Total Sputum Pot			Status
				Sputum pot with the sputum sample	Sputum pot without the sputum sample	Sputum pot was not returned	
1.	Control	Tn. P	5 (38,45%)	0	5	0	-
2.		Tn. S	2 (15,3%)	0	2	0	-
3.		Tn. H	1 (7,6%)	0	1	0	-
4.		Tn. Y	1 (7,6%)	0	1	0	-
5.	Intervention	Tn. B	2 (15,3%)	2	0	0	Lab
6.		Tn. A	2 (15,3%)	0	2	0	-
Total			13 (100%)	2 (15,3%)	11 (84,7%)	0 (0%)	-
				13 (100%)			

Table 4. The success of sputum removal for inspection

Group	Sputum spit out		Percent of Success
	Capable	Unable	
Intervention	2 (66,7%)	3 (33,3%)	2/5 (40%)
Control	0 (0%)	8 (66,7%)	0/8 (0%)
Total	13 Pot Sputum (100%)		

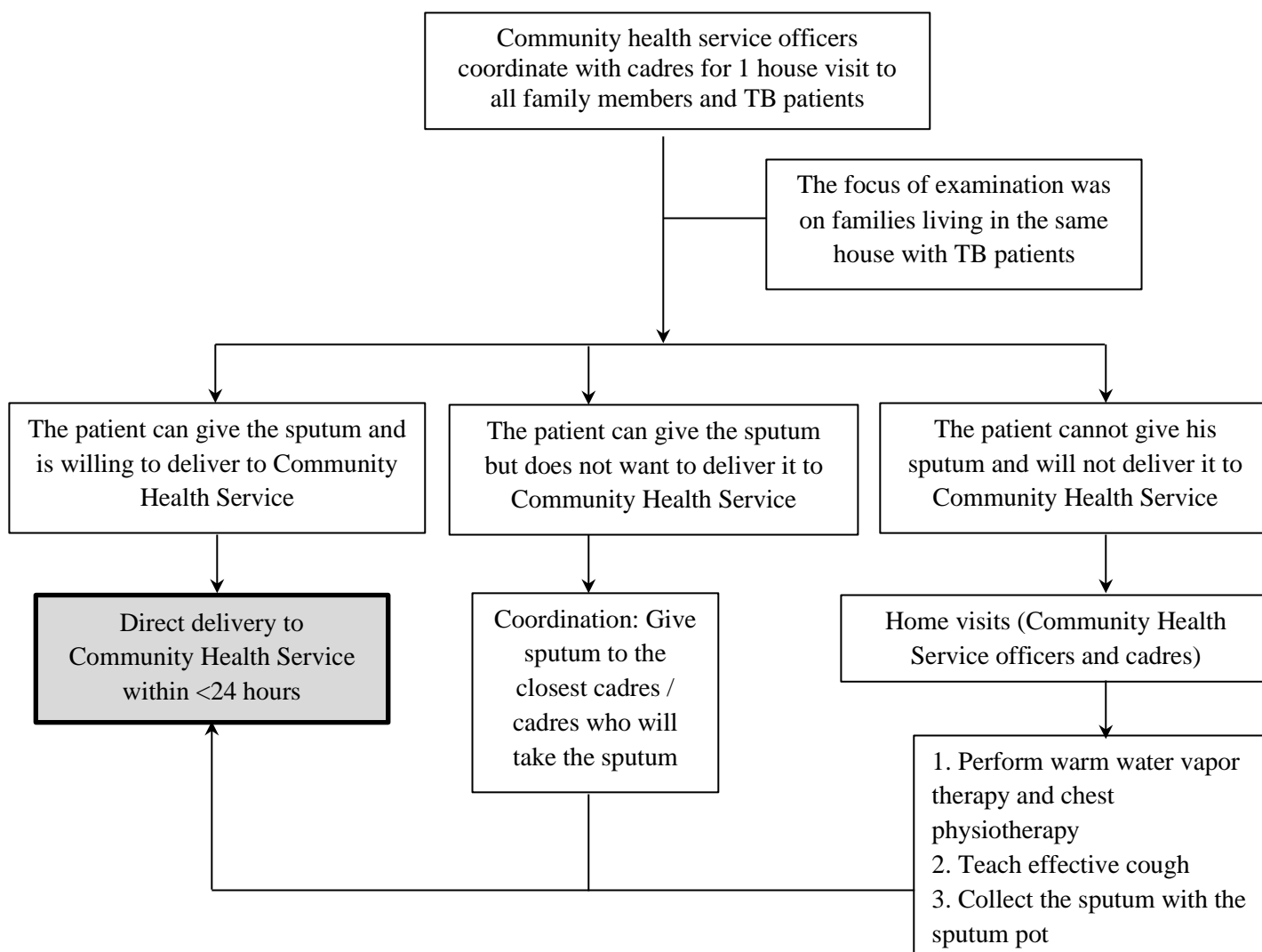


Figure 1. Sputum Sampling Workflow

Table 1. Strategic Steps to Implement the MPIS-TB

Plan	Program Planning: 1. Preparation of ideas (Literature and Field Studies; Primary and Secondary Data); 2. Preparation of Tools and Materials (Thermometer, SRQ & Quick Check, Sputum Pot, Eucalyptus Oil, Health Education Video TB); 3. Breeding Program; 4. Coordination of Cadres
Do	1. Program trials were conducted in 3 sub-districts, using the 2 group method (intervention and control). 2. Trials in Intervention Group using three activities: Early Detection Covid-19 Cough and Chest physiotherapy Effective and Simple Inhalation Therapy. The therapy was carried out for 30 minutes in the morning and evening for 3 days. 3. Try to collect the sputum of a patient who lives in the same house with TB patients.
Check	We have two types of Evaluation: a.Process evaluation can check the implementation of activities, whether they are according to what was planned or not. b.Evaluation of output: check whether the problem has been resolved or not.
Action	It is expected that after 3 days, the problem can be resolved with real results and positive linear statistics. This program's follow-up is monitoring and information in the family community stage wave for December 21, 2020.



Figure 2. Sputum sampling using a sputum pot



Figure 3. Monitoring and evaluation of teaching of simple inhalation therapy, chest physiotherapy, and effective coughing.

CONCLUSION

The implementation of the MPIS-TB Program Innovation was successful with a sputum return ratio in the intervention and control groups of 40%: 0% so that in the future, this program could be applied to the TB health center program. It is hoped that the public health center will further improve outreach, especially in community groups by coordinating and involving

community / religious leaders, community organizations, and other cross-sectors.

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