JURNAL EMPATHY Pengabdian Kepada Masyarakat
Vol. 6, No.1, June 2025
DOI : https://doi.org/10.37341/jurnalempathy.v6i1.268

Optimisation of Integrated Tuberculosis Screening by Health Cadres in Sinduharjo Urban Village, Ngaglik, Sleman

Dewi Ariyani Wulandari[1*], Prastiwi Putri Basuki[2], Antok Nurwidi Antara[3], Intan Puji Prilanty[4], Mita Febriani[5], Roynaldus Rehi Kalli[6]

[1,2] Public Health Undergraduate Program, Wira Husada Health College, Yogyakarta
[3] Nursing Undergraduate Program, Wira Husada Health College, Yogyakarta
[4,5,6] Public Health Undergraduate Program Students, Wira Husada Health College, Yogyakarta

ABSTRACT

Background: *The strategy to increase TBC coverage and detection is through Active Case Finding (ACF) through TBC screening training for health cadres. Health cadres who are trained and understand the signs and symptoms of TBC are expected to help increase TBC findings in the community and reduce the stigma of TBC in the community. This community service activity aims to equip cadres with basic TBC screening skillsand equip cadres in implementing ILP Posyandu (Primary Service Integration) management.*

Methods: *The implementation method consists of preparation stage, implementation, training, application of technology, and monitoring and evaluation. Training was given 2 times with assistance. Training on cadre understanding of TBC and TBC screening was attended by 24 cadres and training on ILP Posyandu management was attended by 15 cadres.*

Results: *There was an increase in knowledge and understanding of cadres with lecture and module methods (p value <0.001) and there was an increase in scores before and after the intervention by an average of 3.79 points and there was an increase in cadre skills in implementing ILP Posyandu. In the implementation of integrated TBC screening, Posyandu ILP was enthusiastically attended by 114 community members consisting of 39 infants and toddlers and 75 adults and the elderly.*

Conclusion: *Provision of health cadres will improve cadre knowledge and skills in conducting integrated TBC screening with Posyandu ILP. This activity is recommended to be carried out through continuous training for health cadres to enhance the capacity for integrated tuberculosis screening at the Posyandu ILP.*

ARTICLE HISTORY
Received: November 30th, 2024
Accepted: July 4th, 2025

KEYWORDS
cadres, posyandu ILP, TBC screening;

CONTACT
Dewi Ariyani Wulandari
✉
dewiwulan02@gmail.com
Program Studi Kesehatan Masyarakat Program Sarjana STIKES Wira Husada Yogyakarta. Babarsari Street, Glendongan, Tambak Bayan, Caturtunggal, Depok District, Sleman Regency, Special Region of Yogyakarta 55281.

Cite this as: Wulandari, D. A., Putri Basuki, P., Nurwidi Antara, A., Puji Prilanty, I., Febriani, M., & Rehi Kalli, R. (2025). Optimisation of Integrated Tuberculosis Screening by Health Cadres in Sinduharjo Urban Village, Ngaglik, Sleman. *Jurnal Empathy Pengabdian Kepada Masyarakat*, *6*(1), 11–22. https://doi.org/10.37341/jurnalempathy.v6i1.268

INTRODUCTION

Tuberculosis (TBC) is an infectious disease caused by Mycobacterium Tubuerculosa and attacks lung tissue. WHO data states that 10.6 million people in the world suffer from TBC (1). TBC is still a top priority in the world and is one of the goals in the Sustainability Development Goals (SDG's). Indonesia is the second largest

country for the highest TBC burden in the world (2). The incidence of TBC cases in Indonesia is 354 per 100. 00 population with a mortality rate of 55 per 100.000 population.

In an effort to eliminate TBC by 2030, the Ministry of Health has set 3 indicators of successful TBC management, namely TBC discovery and treatment coverage, TBC success rate, and TBC preventive therapy coverage (2). A strategy to improve TBC coverage and discovery is Active Case Finding (ACF). ACF is a proactive strategy in providing health services to both patients and at-risk populations (3). This TBC screening strategy through ACF is very useful in the early detection of TBC diagnosis so as to reduce catastrophic costs affecting high-risk groups, but it cannot address disparities in health services (4).

The implementation of ACF is influenced by health system and non-health system factors. Health system barriers include lack of resources, inadequate infrastructure including lack of diagnostic equipment, reagents, and consumables to detect TBC cases, poor quality of service, poor motivation, skills and motivation of staff, and programme funding support (5). Non-health system barriers include stigmatisation, cost, transportation, lack of knowledge of diagnostic tests and language barriers (3). Research on TBC case finding in Semarang City mentioned the barriers of the number of officers and the participation of cadres is still very lacking (6).

An effort to improve the ACF TBC strategy is to integrate with ILP (Primary Service Integration) posyandu services. Posyandu ILP is part of the transformation of health services at the basic level which aims to strengthen health services that are promotive and preventive in all life cycles at the village level. The role of health cadres is at the forefront of integrating ACF into Posyandu ILP. The concept is a strategic effort to provide TBC education and screening for vulnerable groups.

Activities that can be carried out include health checks, symptom checks, and referral for further examination if signs of TBC are found. It is hoped that TBC eradication efforts can be better integrated with other health services and expand the reach and increase public awareness about prevention and early treatment of TBC (7). The results of the evaluation of TBC case finding coverage in Sleman Regency in 2022 were 1915 cases out of 2236 cases that were successfully treated. The TBC Succsess Rate (SR) in 2022 for SO TBC was 83.28% and RO TBC was 58.33%.

Evaluation results from Puskesmas Ngaglik 1 related to the Sleman District Tuberculosis Information System (SITBC), the prevalence of TBC patients in 2022 was 11 TBC patients and in 2023 it increased to 14 TBC patients. Among the 14 TBC patients, there was 1 patient from Ngaglik hamlet. SITBC data for 2023 also mentions 1 patient with DR-TBC (Drug Resistant) from a hamlet in the Sinduharjo area (8). Interviews with 3 of the 15 "Posyandu Matahari" cadres revealed that the community in Nglaban sub-village in Sinduharjo has a lot of unknown information regarding the spread of TBC. The understanding of TBC transmission among health cadres is also not yet comprehensive, due to the fact that not all health cadres have received information on TBC transmission and prevention.

Health cadres as "agents of change" have an important role to play in informing the community about health issues. It is this role that will help reduce barriers to TBC stigma in the community. The TBC cadre engagement model is capable of improving ACF but requires a comprehensive approach including comprehensive training, ongoing supervision, fair compensation and integration into the health system (9). Mobilising and engaging health cadres has an important role in finding new TBC cases in the

neighbourhood, monitoring the treatment of TBC patients and fostering community awareness in preventing and transmitting TBC.

The role of health cadres as trained personnel requires training to familiarise them with their duties in the community and contribute to reducing the number of TBC cases. The vision and mission of the local stakeholders and Puskesmas Ngaglik 1 are in line with this activity, which is to empower and organise health cadres through integrated TBC screening with Posyandu. The expectation of this activity is to improve the knowledge and skills of cadres when conducting simple TBC screening within the Posyandu ILP, thereby increasing TBC case finding in the community as well as screening for risk factors for non-communicable and communicable diseases.

METHODS

The implementation of the TBC screening optimisation activity for health cadres was carried out in August 2024 with the implementation location at Puskesmas Nggalik 1 and Nglaban Village. The material provided is related to TBC screening at Posyandu ILP with the target target cadre "Posyandu Matahari". Evaluation assessment instruments using questionnaires and observation sheets.

The steps taken during this community-based service activity are:

Preparation Stage

Advocating with the village government, the Ngaglik 1 Puskesmas, involving the puskesmas in efforts to synchronise the synchronisation of UKM (Community Health Efforts) activities, communication and FGDs with the hamlet and Posyandu Matahari health cadres).

Training Stage

Counselling on prevention and transmission of TBC in the community to health cadres, effective communication training in integrated Posyandu and TBC screening activities, Posyandu management training and integrated TBC screening which includes planning, organising, mobilising and controlling.

Technology Implementation Stage

Posyandu management training and integrated TBC screening, TBC *self-screening* counselling in the community. The technology here is the application of training and screening concepts in the ILP posyandu. Cadres are equipped with basic TBC screening modules, and the community is provided with *leaflets* containing information related to TBC prevention, transmission, and treatment. Modules and leaflets are made by the service team that have been consulted with experts and have registered patents.

Assistance and Evaluation Stage

All series of activities are assessed by giving a *pre-test* instrument before the activity is carried out and after the activity is carried out a *post-test* is given to determine changes in knowledge, understanding and skills of target partners and the community. The *pre-test* and *post-test* instruments are in the form of questionnaires and to evaluate the skills of cadres using observation sheets.

RESULTS

Preparation Stage

The first stage of preparation includes advocacy to Sinduharjo Village and Ngaglik 1 Sleman Community Health Centre regarding Community Service activities for TBC screening integrated with ILP posyandu (Primary Service Integration). The implementation of the FGD (Focus Group Discussion) of the Sinduharjo village was held on Thursday 22 August 2024 at the Sinduharjo Ngaglik Sleman meeting room and was attended by the Head of Sinduharjo Ngaglik Village and his staff. The second FGD with Puskesmas Ngaglik 1 was held on Saturday 27 July 2024 at the meeting hall of Puskesmas Ngaglik 1. This FGD was attended by the Head of Puskesmas Ngaglik 1 and staff consisting of the person in charge of SMEs (Community Health Efforts), Puskesmas TBC control programmer and other staff. The FGD discussed the training of health cadres for TBC.

Implementation Stages

The implementation stage is divided into several activities, namely training of health cadres related to empowering cadres to recognise signs of TBC transmission and control in the community, training on the revitalisation of ILP posyandu integrated with TBC screening and implementation of ILP Posyandu integrated with TBC screening targeting the Nglaban Padukuhan community.

Health Cadre Training on TBC Transmission and Control

The health cadre training was held on Thursday, 1 August 2024 at the hall of Puskesmas Ngaglik 1. The training was attended by health cadres in the working area of Puskesmas Ngaglik.

Figure 1. Implementation of Health Cadre Training at Puskesmas Ngaglik 1 Sleman

The results of the cadre training observations are summarised in Table 1 which describes the characteristics of the health cadres who attended the cadre training activities related to TBC transmission and control. Most cadres were aged 50–59 years (41.67%). All cadres were female (100%). In terms of education, the majority graduated from senior high school (75%). Most cadres were housewives (83.3%). Regarding length of time serving as a cadre, the largest proportion had 11–15 years of experience (58.33%).

Table 1. Characteristics of TBC Cadres in the Ngaglik Health Centre Working Area (n = 24 Cadres)

Variable	Category	Frequency (n)	Percentage (%)
Age	30-39 years	2	8.33
	40-49 Years	8	33.33
	50-59 Years	10	41.67
	60-69 Years	3	12.50
	70-79 Years	1	4.17
	Total	**24**	**100**
Gender	Female	24	100
	Male	0	0
	Total	**24**	**100**
Education	Graduated from Primary School	3	12.5
	Graduated from Junior High School	0	0.0
	Graduated from Senior High School	18	75
	College Graduate	3	12.5
	Total	**24**	**100**
Occupation	Housewife	20	83.3
	Self-employed	4	16.7
	Total	**24**	**100**
Length of Time as a Cadre	< 5 years	1	4.17
	6 - 10 years	4	16.67
	11 - 15 years	14	58.33
	>15 Years	5	20.83
	Total	**24**	**100**

From the results of the training activities on cadres' understanding of TBC, 100% of cadres increased their knowledge related to transmission, prevention and treatment of TBC in the community with an average score increase of 3.79 points. Statistical analyses showed that education using a combination of modules and lectures was effective in increasing cadres' knowledge of TBC prevention and transmission (p value <0.001). These results are summarised in Table 2.

Table 2. Results of Pre Test and Post Test Knowledge of Health Cadres (n = 24 Cadres)

Group	Value	Z	*p-value*
Pre-test			
Mean	15.25		
Median	15		
SD	3.59		
Min-Max	12-30	-3.61	**<0.001**
Post-test			
Mean	19		
Median	19		
SD	1.59		
Min-Max	16-21		

Training on Implementation of TBC Screening integrated with Posyandu ILP

The follow-up activity to the partner "Posyandu Matahari" in Nglaban was held on Saturday 24 August 2024 and was attended by all 15 Posyandu Matahari cadres. In this activity, cadres were given skills in implementing posyandu with the concept of 5 tables modified with TBC screening activities integrated with ILP Posyandu activities. The training material is guided by the Basic Skills Training Curriculum for Posyandu Cadres from the Ministry of Health of the Republic of Indonesia which is modified with the various needs of "Posyandu Matahari" cadres.

Implementation of TBC Screening Integrated with ILP Posyandu

The implementation of TBC screening integrated with posyandu was carried out on Saturday, 31 August 2024. The Head of Sinduharjo Ngaglik Village and the Puskesmas Ngaglik 1 Sleman were also present. In this activity, posyandu cadres were accompanied by students in monitoring the implementation of the ILP posyandu. The posyandu was attended by 114 community members consisting of 39 infants and toddlers and 75 young adults and the elderly. From the results of TBC screening in toddlers, no TBC cases were found from the basic TBC screening results. Data on integrated TBC screening visits are illustrated in tables 4 and 5.

According to the results of the screening of risk factors for infectious and non-communicable diseases, the recap results were sent to Ngaglik 1 Health Centre for follow-up. Those with risk factors will be followed up for screening at Ngaglik 1 Health Centre. Screening through posyandu is very effective in screening for communicable and non-communicable diseases in the community.

Table 3. Results of Skill Assessment of "Posyandu Matahari" Cadres (n = 15 Cadres)

Skill Type	Achievement	
	Highly skilled	**Skilled enough**
Posyandu Management Skills		
Describe the posyandu service package for the entire life cycle.	15 cadres (100%)	-
Carry out recording and reporting.	13 cadres (86.67%)	2 cadres (13.33%)
Infant and Toddler Skills		
Explain how to use the KIA Book section for infants and toddlers.	15 cadres (100%)	-
Delivering exclusive breastfeeding counselling, age-appropriate breastfeeding MPs.	15 cadres (100%)	-
Conduct weighing, measuring length/height and head circumference and upper arm circumference.	15 cadres (100%)	-
Explaining the results of weight and height measurements, lack, normal and follow-up.	15 cadres (100%)	-

Skill Type	Achievement	
	Highly skilled	**Skilled enough**
Maternity, Breastfeeding Skills		
Explain the examination of pregnant women and postpartum women.	15 cadres (100%)	-
Explained that pregnant women need to monitor arm circumference, blood pressure, and weight with the KIA Book curve.	15 cadres (100%)	-
School Age and Adolescent Skills		
Explain anaemia prevention programmes (blood supplement tablets and Hb screening of adolescent girls)	12 cadres (80%)	3 cadres (20%)
Productive Age and Elderly Skills		
Conduct early detection of adults and the elderly (check cholesterol, uric acid, blood sugar).	14 cadres (93.3%)	1 cadre (6.67%)
Conduct early detection of adults and the elderly by measuring abdominal circumference, blood pressure (obesity, hypertension).	15 cadres (100%)	-
Effective communication skills	12 cadres (80%)	3 cadres (20%)
TBC screening is integrated with Posyandu	15 cadres (100%)	-

The majority of cadres demonstrate high skills in various Posyandu services (Table 3). All cadres (100%) are highly skilled in Posyandu management, baby and toddler services, services for pregnant and breastfeeding mothers, as well as integrated TB screening. The majority of cadres are also skilled in the prevention of anemia among adolescents (80%), early detection of diseases in the productive age and elderly (93.3–100%), and effective communication (80%). These results are summarised in Table 3.

Table 4. Infant, Toddler Visits for Basic TBC Screening Integrated with Posyandu (n = 39)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	15	38.46
Female	24	61.54
Total	**39**	**100**
Age		
< 1 year	4	10.26
1 - 2 years 11 months	18	46.15
3 - 5 years	17	43.59

Variable	Frequency (n)	Percentage (%)
Total	**39**	**100**
Body Weight		
Normal for Age	39	100
Total	**39**	**100**
Body Height		
Normal for Age	39	100
Total	**39**	**100**
Head Circumference		
Normal for Age	39	100
Total	**39**	**100**
Upper Arm Circumference		
Normal for Age	39	100
Total	**39**	**100**
TBC Baseline Screening		
Normal and No signs and Symptoms	39	100
Total	**39**	**100**

Source: Primary Data, 2024

The majority of the children are female (61.54%). Based on age, the majority fall into the group of 1 to 2 years and 11 months (46.15%) and 3 to 5 years (43.59%). All children (100%) have a normal status for weight, height, head circumference, and upper arm circumference according to their age. Basic TBC screening also indicates that all children are in normal condition without any signs and symptoms of TBC (100%). These results are summarised in Table 4.

Figure 2. Integrated TBC Screening Activity

The majority of participants are female (72%) and over the age of 60 (48%). Most have a body mass index in the ideal category (49.33%). A significant proportion also has high cholesterol levels (66.67%), high blood sugar levels (62.67%), and normal uric acid levels (68%). Most participants are in a normal condition without any signs or symptoms of tuberculosis (77.33%). These results are summarised in Table 5.

Table 5. Adult and Elderly Visits for Basic Integrated TBC Screening at Posyandu (n = 75)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	21	28
Female	54	72
Total	**75**	**100**
Age (years)		
20-30	2	2.67
31-40	3	4.00
41-50	12	16.00
50-60	22	29.33
> 60	36	48.00
Total	**75**	**100**
Body Mass Index (BMI)		
Underweight (<18)	8	10.67
Ideal (18.5-25)	37	49.33
Fat (>25)	30	40.00
Total	**75**	**100**
Cholesterol		
Normal (<200 mg/dL)	25	33.33
>High (≥200 mg/dL)	50	66.67
Total	**75**	**100**
Blood Sugar		
Normal (<100 mg/dL)	28	37.33
High (≥100 mg/dL)	47	62.67
Total	**75**	**100**
Uric Acid		
Normal (2.4 – 6.0 mg/dL)	51	68.00
High (> 6.0 mg/dL)	24	32.00
Total	**75**	**100**
TBC Baseline Screening		
Normal	58	77.33
Detected 1 sign	12	16.00
Detected 2 marks	4	5.33
Detected 3 marks	1	1.33
Total	**75**	**100**

Source: Primary Data, 2024

DISCUSSION

ILP is part of the health system transformation developed by the Ministry of Health. In the ILP era, health services were adapted to the stages of the life cycle, service access is expanded to be closer to the community, and Local Area Monitoring (PWS) is carried out through home visits to each head of household in the area. Posyandu managerial training, basic health screening skills and effective communication skills are fundamental to the implementation of Posyandu ILP (10).

A cadre's understanding of basic TBC screening is essential in recognising the signs and symptoms of TBC. Early symptoms of TBC include cough lasting more than 2

weeks, loss of appetite, fatigue and weakness, fever, chest pain, cold fever, cold sweat, night sweats, coughing up blood, weight loss. The programme of mentoring and empowering health cadres in basic TBC screening efforts integrated with posyandu services in the community is one of the strategies for TBC case finding in the community (11).

Health cadres are people who are trained by health workers in an effort to overcome health problems in the community. The role of trained cadres who understand the signs and symptoms of TBC will help reduce TBC stigma in the community (12). The TBC cadre engagement model can increase ACF *case finding* but requires a comprehensive approach including comprehensive training, ongoing supervision, fair compensation and integration into the health system. Facilitating TBC cadres with simple and easy-to-use *booklets* will increase knowledge and improve the role of cadres through communication patterns and increase community trust (9)(13).

Empowering health cadres is the first step in improving cadre knowledge about TBC. Health cadres act as agents of change in the community, helping people understand the risks and prevention of TBC. A good understanding resulting from cadre training will improve the positive attitude of TBC cadres and be integrated into their mindset so that they make consistent promotive efforts (14). Equipping cadres with effective communication training is very useful in an effort to increase the role of cadres in TBC prevention and control efforts in the community.

Consistent promotive efforts will increase TBC case finding in the community and eliminate the negative stigma of TBC in the community (15). Increased cadre knowledge of TBC disease will greatly influence attitudes and efforts to motivate the community to seek health services and treat TBC properly (16). ILP is an effort to strengthen promotion and prevention efforts to create healthier communities, improve health services, and increase primary care capacity. In transposing the main services of Posyandu development at the district/RT/RW level, the health sector in Posyandu will serve target groups throughout the life cycle, from pregnant women; postpartum women to breastfeeding mothers; toddlers and preschoolers; school age and adolescents; adults; and the elderly (17).

CONCLUSIONS AND SUGGESTIONS

Empowerment of TBC cadres through lectures and modules effectively increased cadres' knowledge and understanding of TBC disease. Assistance to provide cadres with skills related to basic TBC screening and ILP posyandu managerial effectively improves the skills of health cadres that will be implemented in TBC screening integrated with ILP Posyandu. The expectation of this activity is that health cadres can help increase the discovery of TBC in the community and eliminate the negative stigma of TBC in the community. The suggestion of this activity is that consistent and continuous monitoring and evaluation is needed in its implementation so that the empowerment and optimisation of health cadres has a positive impact on the community.

ACKNOWLEDGEMENTS

We would like to thank the Directorate of Research, Technology, and Community Service; Directorate General of Higher Education, Research and Technology; Ministry of Education, Culture, Research and Technology of the Republic of Indonesia for grant funding support for community service activities in 2024. We would like to thank the Head of Sinduharjo Village, Ngaglik 1 Sleman Community Health Centre and Nglaban

Padukungan as partners of community service activities. We thank the Chairperson of STIKES Wira Husada and the Chairperson of LPPM STIKES Wira Husada for their support in the community service activities of lecturers and students.

REFERENCES

1. World Health Organization (WHO). Funding a tuberculosis-free future: An investment case for screening and preventive treatment. Geneva: Word Health Organization; 2024.

2. Kementerian Kesehataan RI. Laporan program penanggulangan tuberkulosis tahun 2022. Kementerian Kesehatan RI; 2023.

3. Fenta MD, Ogundijo OA, Warsame AAA, Belay AG. Facilitators and barriers to tuberculosis active case findings in low- and middle-income countries: A systematic review of qualitative research. BMC Infect Dis. 2023 Aug 7;23(1):515.

4. Shewade HD, Gupta V, Satyanarayana S, Kharate A, Sahai KN, Murali L, et al. Active case finding among marginalised and vulnerable populations reduces catastrophic costs due to tuberculosis diagnosis. Global Health Action. 2018 Jan;11(1):1494897.

5. Pradipta IS, Houtsma D, Van Boven JFM, Alffenaar JWC, Hak E. Interventions to improve medication adherence in tuberculosis patients: a systematic review of randomized controlled studies. npj Prim Care Respir Med. 2020 May 11;30(1):21.

6. Ulfa S lutfia, Mardiana. Implementasi penemuan kasus TB paru dalam penanggulangan tuberkulosis di Puskesmas Karangmalang Kota Semarang. Indonesian Journal of Public Health and Nutrition. 2021;1(1):31–41.

7. Kementerian Kesehataan RI. Keputusan Menteri Kesehatan Republik Indonesia Nomor Hk.01.07/Menkes/2015/2023. Kementerian Kesehatan RI; 2023.

8. Dinas Kesehatan Kabupaten Sleman. Sistem Informasi Tuberculosis (SITB) Kabupaten Sleman. Dinas Kesehatan Kabupaten Sleman; 2023.

9. Dam TA, Forse RJ, Tran PMT, Vo LNQ, Codlin AJ, Nguyen LP, et al. What makes community health worker models for tuberculosis active case finding work? A cross-sectional study of TB REACH projects to identify success factors for increasing case notifications. Hum Resour Health. 2022 Dec;20(1):25.

10. Kementerian Kesehataan RI. Kurikulum Pelatihan bagi Pelatih Keterampilan Dasar bagi Kader Posyandu. Jakarta: Kementerian Kesehatan RI; 2023.

11. Kementerian Kesehataan RI. Petunjuk Teknis Ma- najemen dan Tatalaksana TB Anak. Direktorat Pencegahan dan Pengendalian Penyakit Kementerian Kesehatan RI; 2016.

12. Kok MC, Dieleman M, Taegtmeyer M, Broerse JE, Kane SS, Ormel H, et al. Which intervention design factors influence the performance of community health workers in low- and middle-income countries? A systematic review. Health Policy Plan. 2015 Nov;30(9):1207–27.

13. Okeyo ILA, Dowse R. An illustrated booklet for reinforcing community health worker knowledge of tuberculosis and facilitating patient counselling. Afr j prim health care fam med [Internet]. 2018 May 24 [cited 2023 Sep 11];10(1). Available from: https://phcfm.org/index.php/phcfm/article/view/1687

14. Prihanto ESD, Gafur R. Edukasi tentang tuberkulosis resisten obat pada kader kesehatan di Puskesmas Siko Kota Ternate. Mandalika Journal of Community Services. 2024;1(2):61–5.

15. Arfan I, Rizky A, Alkadri SR. Optimalisasi kemampuan kader TB dalam pengendalian tuberkulosis. Dharma Raflesia Jurnal Ilmiah Pengembangan dan Penerapan IPTEKS. 2020 Desember;18(2):209–2017.

16. Suviani A, Pramono JS, Mustaming. The effect of counseling training for health caders on the skill of providing information on tuberculosis threatment at Dempar Health Center, Nyuatan District, West Kutai regency. Farmosa Journal of Science and Technology. 2023;2(5):1343–56.

17. Surtimanah T, Sjamsuddin IN, Ruhyat E, Pamungkas G. Peningkatan pengetahuan kader tentang posyandu di era transformasi layanan kesehatan primer dan kewirausahaan. JPPM. 2024 Aug 15;8(2):295.