

ORIGINAL RESEARCH ARTICLE

Evaluation of short-course for private doctors in managing children tuberculosis as part of a public-private mix in Surabaya, Indonesia

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Abstract

This study aimed to improve the private doctor's role in discovering and managing cases of childhood tuberculosis (TB) according to the Directly Observed Treatment Short-course program. This quasi-experimental study with a pre-post design described 75 private doctors (intervention group) who assisted over two months in finding suspected TB children and 75 private doctors (control group). This study used descriptive quantitative data analysis. Sixty-three of the 75 doctors (84%) attended a course to assist suspected tuberculosis children with a moderate level of knowledge (60.0%). Most suspected tuberculosis children had close contact with adult tuberculosis patients (48.1%). The findings indicated that the intervention group, consisting of skilled private doctors, identified a greater number of children believed to have tuberculosis compared to the control group. There has been an increase in the identification of suspected tuberculosis children by private doctors who were through courses and the provision of routine assistance.. (*Afr J Reprod Health* 2024; 28 [10s]: 152-159).

Keywords: Public private mix, tuberculosis, children, private doctor, evaluation

Résumé

Cette étude visait à améliorer le rôle du médecin privé dans la découverte et la gestion des cas de tuberculose (TB) infantile selon le programme de traitement de courte durée sous surveillance directe. Cette étude quasi-expérimentale avec une conception pré-post a décrit 75 médecins privés (groupe d'intervention) qui ont aidé pendant deux mois à trouver des enfants suspectés de tuberculose et 75 médecins privés (groupe témoin). Cette étude a utilisé une analyse de données quantitatives descriptives. Soixante-trois des 75 médecins (84 %) ont suivi un cours d'assistance aux enfants suspectés de tuberculose avec un niveau de connaissances modéré (60,0 %). La plupart des enfants suspectés de tuberculose ont eu des contacts étroits avec des patients adultes tuberculeux (48,1 %). Les résultats ont indiqué que le groupe d'intervention, composé de médecins privés qualifiés, a identifié un plus grand nombre d'enfants soupçonnés d'être atteints de tuberculose que le groupe témoin. Il y a eu une augmentation du nombre d'enfants suspectés de tuberculose identifiés par des médecins privés qui suivaient des cours et fournissaient une assistance de routine. (*Afr J Reprod Health* 2024; 28 [10s]: 152-159).

Mots-clés: Mixité public-privé, tuberculose, enfants, médecin privé, évaluation

Introduction

One of the diseases that cause significant mortality worldwide is tuberculosis (TB). In nations where TB is endemic, it remains a leading cause of death.¹ In 2020, an estimated 9.9 million (8.9-11.0 million) people globally were affected by TB. Indonesia ranks third in terms of global TB burden, accounting

for 8.4% of cases.² The incidence of TB in children is alarmingly high and rapidly increasing.³ The proportion of TB cases in children in Indonesia varies widely. Only 520,000 cases were diagnosed by the national program and reported to the WHO in 2019, of which an estimated 1-2 million children aged 0-14 years had TB.⁴ Children aged 0-14 years are particularly vulnerable to TB transmission, and

if they are infected they are likely to suffer from tuberculous meningitis, miliary tuberculosis, or severe lung disease.⁵

The challenges faced by children with TB include difficulties in diagnosis, treatment, and prevention.^{6,7} Diagnosing TB in children requires a careful history and analysis, including contact history with adult TB cases, physical examination, and additional tests like tuberculin skin tests and X-rays.^{8,9} It is predicted that many children with TB in Indonesia do not receive appropriate treatment as per the Directly Observed Treatment, Short-course (DOTS) strategy.¹⁰ Additionally, nearly half of TB cases are considered missing cases due to lack of notification to the National TB Control Program (NTP), affecting transmission rates and increasing mortality.^{2,7}

The Public-Private Mix (PPM) is a national TB program that the Global TB Strategy recommends that includes the private health sector. The PPM-DOTS strategy involves all public and private sector health service providers in TB prevention, management, and control to achieve TB treatment targets both nationally and internationally.¹¹ This includes joint roles for the public sector in providing a location and the private sector in assisting in patients' identification and treatment.¹² In Indonesia, the public sector provides health services for TB patients through community health centres and government hospitals, while the private sector provides private hospitals, private clinics, and private doctors. A number of doctors in the country combine their dual practice in the community health centre and the private sector.^{13,14} The country's public health service facilities include 9,601 health centres and 861 government hospitals. In Indonesia, the number of private healthcare facilities is still rising. There are 24,716 private pharmacies, 8,615 licensed drugstores, 1,553 private hospitals, and 110,000 registered doctors.¹³

To maintain a decentralized government, Indonesia established agencies at central, provincial, and district levels. Districts are responsible for implementing central government policies. This decentralized framework impacts the central government's primary approach as the vertical

provider of TB programs. Consequently, PPM is referred to as district-based PPM (DPPM) in Indonesia, delivered under the responsibility of the District Health Offices (DHO).^{13,15} The private sector's involvement in the TB program can reduce patient care costs by eliminating delays in diagnosis and treatment, increasing detection, and reporting TB cases.¹⁶

The DHO coordinates a collaborative network of government and private healthcare facilities, and participates in professional associations for TB control under the DPPM approach. Community health centers collaborate with private doctors, clinics, pharmacies, and laboratories within their service areas (sub-districts) to provide standardized TB services, including case discovery, diagnosis, therapy, contact detection, logistics, referrals, recording, and reporting.¹⁷ Most private doctors do not contribute to national surveillance data, leading to inaccuracies in the national TB report. Furthermore, not all private physicians are affiliated with medical facilities in Surabaya City, and an estimated 75% of private doctors are unfamiliar with the International Standards for TB Care (ISTC) and DOTS.¹

To improve the effectiveness of this collaboration, there is a need to foster stronger partnerships between public health centre and private health care providers to streamline the referral and treatment process and ensure timely diagnosis and appropriate treatment of TB cases. To achieve this goal, the hope is to reduce delays in diagnosis and treatment, improve detection and reporting of TB cases, and ultimately reduce the burden of TB among children and the general population in Indonesia.

Methods

Study design

An observational study using quasi-experimental design with pre-post test was conducted to analyse the results of the intervention of doctors who attended courses on early detection of TB in children and were accompanied every 2 weeks for 2 months.

Samples and settings

This study was conducted from September to December 2017 in two parts. The first two months provided courses for private doctors, while during the following two months, they carried out early detection of suspected TB in children. Sampling used a purposive sampling technique in the North Surabaya area (intervention group) and East Surabaya area (control group), each with a total of 75 private doctors. The course delivered to the intervention group comprised approaches for combatting TB using the concept of Public Private Mix (PPM), which includes the involvement of private doctors. Private doctors were required to take courses for two months prior to conducting suspect TB children detection since not all private doctors were familiar with the standardized TB-DOTS service management.

The participation requirement in this study were 1) doctors who have a doctor's certificate; 2) having been a doctor in Surabaya city for a minimum of one year; 3) willing to become research respondents by signing an informed consent; 4) finding cases of suspected TB children during independent practice; and 5) having a children TB patient with symptoms in the preceding 30 days.

This study did not require risky treatment for respondents. There were no potential dangers to the doctors in participating in the study, especially in finding suspected TB children. In addition, doctors benefitted from this activity by attending courses. In addition, we obtained a study permit to the local government (Surabaya City National Unity and Political Protection Agency), the Surabaya City Health Office and the Professional Organization, namely the Indonesian Doctors Association (IDI) Surabaya. This research has received ethical approval from Faculty of Public Health Universitas Airlangga No 540-KEPK.

Variables

The variables in this study were 1) Knowledge of doctors who carried out early detection of suspected TB children based on the TB DOTS program; 2) Doctor's level of knowledge about TB DOTS; 3)

Comparison of the characteristics of doctors who took the course and those who did not take the course; and 4) finding suspected TB children by doctors who had taken the course. The use of an examination form in accordance with a translated standards while providing children with TB services that result in pulmonary TB diagnosis at private doctor's practices was also an outcome variable.

Data analysis

The study obtained data of doctors who practice in North Surabaya and East Surabaya and the findings of suspected TB children by doctors who had attended courses. Quantitative data analysis was descriptive in nature and was presented in tables of frequencies and percentages. Comparative analysis of doctor's characteristics in the detection of suspect TB children used binary logistic regression, calculated p-value <0.05, OR and Confidence Interval 95%.

Results

We obtained data from 75 doctors in North Surabaya as the intervention group and 75 doctors in East Surabaya as the control group. Sixty-three of the 75 doctors (84%) from the intervention group had attended a course on early detection of TB in children and received assistance four times in two months.

The results of measuring the level of knowledge of all doctors about TB DOTS shown in Figure 1 indicates that the highest percentage of private doctors in the city of Surabaya had moderate knowledge level (60.0%) of TB DOTS. When comparing the level of knowledge before and after the intervention, doctors in the intervention group in North Surabaya had a moderate level of knowledge (77.3%) before the intervention, and after the intervention had a high level of knowledge (50.7%). Doctors in the control group in East Surabaya had a moderate level of knowledge before the intervention (70.7%) and after the intervention had moderate knowledge (73.3%) (Table 1). Based on the results of the completion of the questionnaire for suspected child TB, there was no influence ($p=0.797$) between

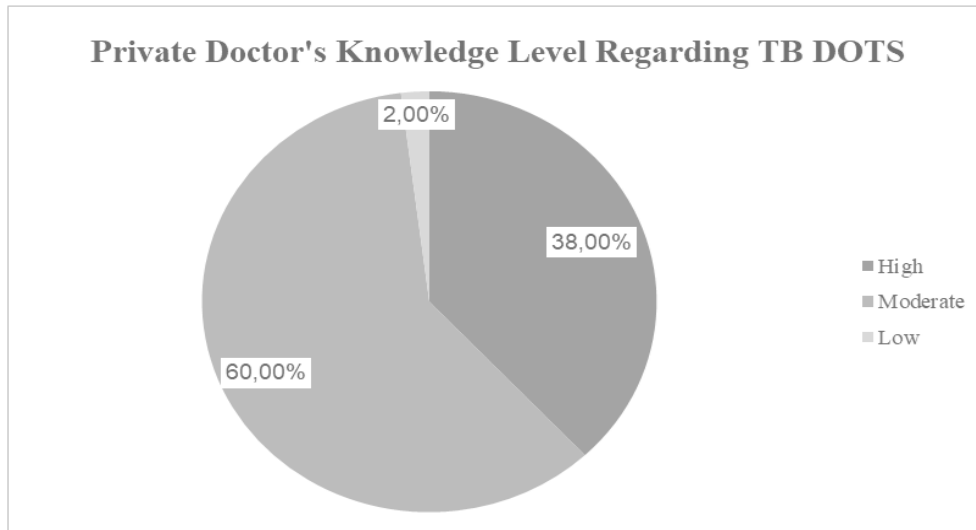


Figure 1: Distribution of private doctor knowledge level regarding TB DOTS

Table 1: Distribution of Private Doctor Knowledge on Findings of Suspect TB Children

Private doctor knowledge level about TB DOTS	Pre-Test		Post Test	
	North Surabaya (Intervention Group) n (%)	East Surabaya (Control Group) n (%)	North Surabaya (Intervention Group) n (%)	East Surabaya (Control Group) n (%)
High	7 (9.3)	5 (6.7)	38 (50.7)	19 (25.3)
Moderate	58 (77.3)	53 (70.7)	35 (46.7)	55 (73.3)
Low	10 (13.3)	17 (22.7)	2 (2.7)	1 (1.3)

the discovery of TB cases during the three months before the intervention and the suspected discoveries of TB in the child. However, after two months of intervention, there is an influence ($p=0.035$) between cases discovered during the interventions and the presumed discovery in child TB. Doctors in the intervention group (Northern Surabaya) are 4.125 times more likely to detect suspected TB in children than doctors in control group (Eastern Surabaya). Descriptive results also indicate that there is an increase in the detection of suspected tuberculosis in children before (12.0%) and during (14.7%) two months of intervention. Based on the gender of doctors ($p=0.491$), the age of the doctor ($p=0.417$), the working days as a doctor ($P=0.102$), and the years of work in Surabaya ($p=2.0263$) did not show

any significant influence on the presumed discovery of TB in children. Doctors who worked ≥ 11 years were 5,657 times more likely to find a suspected child's TB, compared to doctors who were working < 10 years.

During the two months, most of the suspected TB children had close contact with adult TB patients (48.1%), symptoms of chronic cough in suspected TB children (70.4%), and were referred to a Health Centre (59.3%) in North Surabaya. In the East Surabaya area, most suspected TB children had BCG scars (44.4%), old fever (77.8%), and were referred to Health Centre (44.4%). Doctors found suspected child TB after receiving courses and assistance in the intervention group as many as 22 children, while in the control group, there were 9 children (Table 3).

Table 2: Distribution of findings suspect TB children based on characteristics of private doctor

Variables	Suspect TB Children		p-value	OR	95% CI
	Yes n (%)	No n (%)			
Findings cases in the last 3 months					
North Surabaya (intervention group)	9 (12.0)	66 (88.0)	0.797	1.142	0.415-3.139
East Surabaya (control group)	8 (10.7)	67 (89.3)			
Findings cases during study					
North Surabaya (intervention group)	11 (14.7)	64 (85.3)	0.035	4.125	1.102-15.446
East Surabaya (control group)	3 (4.0)	72 (96.0)			
Based on Gender					
Male	7 (8.0)	81 (92.0)	0.491	0.678	0.226-2.044
Female	7 (11.3)	55 (88.7)			
Based on Age					
≤ 55	13 (10.2)	115 (89.8)	0.417	2.374	0.295-19.125
≥ 56	1 (4.5)	21 (95.5)			
Based on years of working as a doctor					
≥ 11	12 (14.6)	70 (85.4)	0.027	5.657	1.220-26.237
≤ 10	2 (2.9)	66 (97.1)			
Based on days of working as a doctor					
1 – 3	2 (3.8)	51 (96.2)	0.102	0.278	0.060-1.291
> 3	12 (12.4)	85 (87.6)			
Based on years of working in Surabaya					
≤ 10	12 (11.0)	97 (89.0)	0.263	2.412	0.516-11.280
≥ 11	2 (4.9)	39 (95.1)			

Table 3: Parameter, symptoms, and follow-up distribution of finding suspect TB children by private doctor

Variables	Private doctor Location	
	North Surabaya n (%)	East Surabaya n (%)
Parameter		
Close contact with TB patient	13 (48.1)	3 (33.3)
There is a BCG scar	9 (33.3)	4 (44.4)
Tuberculin skin test	3 (11.1)	0 (0.0)
Symptoms		
Chronic cough	19 (70.4)	2 (22.2)
Old fever	11 (40.7)	7 (77.8)
Weight loss	15 (55.6)	5 (55.6)
Enlarged lymph nodes	8 (29.6)	6 (66.7)
Lethargic (inactive)	4 (14.8)	0 (0.0)
Follow-up		
Self-medicated	6 (22.2)	2 (22.2)
Referred to health center	16 (59.3)	4 (44.4)
Referred to hospital	5 (18.5)	3 (33.3)
Referred to clinic	0 (0.0)	0 (0.0)

North Surabaya % of 22 children; East Surabaya % of 9 children

Discussion

The trend of TB cases in Surabaya city has increased since 2014. However, this trend does not reflect the actual situation because most private doctors do not contribute to the national surveillance data.¹ Another fact is that not all registered private doctors have received DOTS and ISTC socialization for new case findings and patient recovery, especially in Surabaya city.¹⁷

According to 84% of the respondents, private doctors who were invited to the courses expressed greater support for the national TB control initiative. According to an Indian study, private doctors typically lack knowledge about DOTS and have insufficient training.¹⁸ According previous research, the treatment plans and diagnostic techniques used by the national TB control program are not confidence.¹⁹ The highest percentage of suspected TB children in North Surabaya was recorded as having symptoms of weight loss, coughing up phlegm, using TST exam and sputum

samples, similar to studies in several European countries.²⁰ Reported that TB children who had been in contact with adult TB were TST positive, clinical or radiological findings suggesting TB.²¹

Similarly, medical treatment duration is six months with medical therapy such as rifampicin, isoniazid for four months, and pyrazinamide also prescribed for two months (2HRZ/4HR).^{22,23} In line with our study, medical treatment outcomes with estimated treatment completion rates of 60%-70%.²⁴⁻²⁶ Prophylactic treatment should be given to reduce the risk of death (2010), similar to our study where treatment was given for at least two months. Private doctor's role in finding suspected TB children is very influential, and this is equivalent to a study that shows that about 60.9% are medical doctors.²⁰ In addition, this study's general knowledge of TB was moderate and showed higher levels after the intervention. This improvement is comparable to findings from a study in Tanzania, which reported higher knowledge levels post-intervention, though our results were lower than those observed in Bhutan.^{27,28}

Several studies have assessed the application of national TB guidelines in the private sector, where they have documented gaps in knowledge and practice for a private doctors to improve TB care delivery.²⁹⁻³¹ A recent report concluded that a one-day training course for private doctors in reading chest radiographs led to limited improvements in their ability to detect TB.³⁰ Additional studies support the concept that field training and follow-up surveillance may be necessary for clinical decision-making and care.³²⁻³⁴ Simple guidance and training focused on the detection of TB children cases are provided to private doctors accompanied by logistical support, resulting in a three-fold higher increase in TB case detection in children compared with no training.³⁵ Support and participation from all government and private sectors (NGOs, agencies, community groups) that care about TB. This study is expected to find suspected TB children and provide adequate treatment assistance to control TB in Surabaya. So that it can increase the TB cure rate and significantly break the chain of transmission in the community.

Strengths and limitations

This research has strengths and limitations. The strengths include the study demonstrates a tangible improvement in identifying suspected TB cases among children through the intervention, highlighting the practical benefits of training private doctors. Conducting the study in a real-world setting with private doctors ensures that the findings are applicable and relevant to everyday medical practice; involving 150 private doctors (75 in the intervention group and 75 in the control group) provides a robust sample size that enhances the reliability of the findings. The study specifically targets private doctors, who play a crucial role in the healthcare system, especially in settings where public health resources may be limited and highlighting the role of private doctors in collaboration with community health centres and TB cadres emphasizes the importance of a community-based approach in managing TB.

The limitations in this research include some private doctors were less supportive due to poor recording and reporting practices, which may have led to underreporting or misreporting of TB cases. Beside that, short duration in this research. The two-month duration of the study may not be sufficient to capture long-term effects and sustainability of the intervention. The absence of a robust monitoring mechanism to ensure continuous support and collaboration between private doctors and community health centres poses a challenge to the sustainability of the improvements observed.

Conclusion

Efforts to involve private doctors in finding child TB cases in Surabaya are crucial and should involve collaboration between the Surabaya City Health Office, the Indonesian Doctor Association Surabaya branch, and related professional organizations. In our study, private doctors in the intervention group, who received courses and regular assistance, identified 22 out of 31 suspected TB children, compared to 9 out of 31 in the control group. This demonstrates the effectiveness of training and

support in enhancing early detection of TB in children by private doctors. However, challenges remain due to missing data and some doctors' reluctance to engage in TB reporting. Establishing a monitoring mechanism and a network between community health centers and private doctors is essential. Coordination with trained cadres under the TB Task Force framework can further optimize implementation in Surabaya City.

Contribution of authors

Rosita Dwi Yuliandari: conceptualized and designed the study; writing manuscript draft
 Chatarina Umbul Wahyuni and Fariani Syahrul: reviewed empirical studies
 Kurnia Dwi Artanti, Muji Sulistyowati, and Soedarsono: designed the methodology
 Yudied Agung Mirasa: collected and analysis the data
 Hari Basuki Notobroto and Mochammad Bagus Qomaruddin: wrote the introduction and edited the paper.

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