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Implementation Fidelity of Directly Observed Therapy Provided in Dili, Municipality of Timor-Leste

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Dili,
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A B S T R A C T

Background: Directly observed treatment (DOT) as the best curative method to stop the spread of tuberculosis in the community and now recommended as a standard of care in the treatment Tuberculosis worldwide. The level of accuracy of implementation is determined by the patient's adherence to the therapeutic strategy, compliance with DOTs services in each existing health facility according to existing guidelines, exposure or dose, quality of delivery and participant response.

Objectives: To assess the implementation fidelity of DOTs Provided in all Community Health Centre in Dili, district of Timor-Leste.

Method: The study uses mixed-method, sequential explanatory design. For quantitative research we conduct cross sectional survey of TB patients from all health facilities provided DOTs in the Dili district, with structure questioner from May to July 2021. For qualitative-in-depth interviews with the Key informants, medical doctor, nurses, and patient respondents from the eight health facilities in Dili, and TB program staff in each Health facility, and responsible for TB programs in Dili district to explore the inhibiting factors affecting patient adherence and provider compliance to DOTs guideline.

Result: The overall DOTs coverage was 26.5% (48/181), Most do therapy themselves or are observed by family members 56.9% (103/181), and a small proportion 18.2 (33/181) only apply DOT when visiting health facilities to take drugs with a frequency of every 15 days. More than 95% of patient received correct dosage and standard regimen of anti-TB drugs according to the guidelines. The factors that influence patient non-adherence to DOT are the distance from the health facility that provides DOT services, the financial implications and the lack of family and government support. however, patient satisfaction with the quality of TB treatment services reached 73.4%. Providing DOTs services at Health post will promote better adherence.

Conclusion: The implementation of the DOTs strategy in the Dili municipality was not reflected in compliance with TB control, which led to a low effectiveness of the program.

1. Introduction

Tuberculosis (TB) is still a public health problem in the world, although there are methods for diagnosis, treatment for prevention, treatment and cure, as well as several strategies for monitoring and controlling it.

It is estimated that 10 million people had TB disease in 2019, and there are an estimated 1.4 million deaths from TB in the world. Most TB patients in 2019 were in WHO Southeast Asia (44%), Africa (25%), and the Pacific (18%). And globally, around three million of them do not access quality services according to integrated programs. (WHO Global TB Report 2020).

In Timor-Leste, with an incidence of 498 per 100,000 population; For comparison, the incidence rate in Indonesia is 316 per 100,000 population, in India 199 per 100,000 population and in China 61 per 100,000 population. Timor-Leste has the 2nd highest TB incidence rate in the WHO South Asia region after North Korea.

In 2018, TB killed 106 people per 100,000 people per month (1400 per year), TL only reached 54% treatment coverage of the estimated 6,500 incident TB patients (498/100,000), leaving a huge treatment gap of 46%. This means there were 2921 TB patients missing from TB notification and treatment in 2018.

Regarding Mortality there was little change in 2019, the mortality rate for TB was 94 deaths per 100,000 people (1200 per year). An estimated 3.1% of all tuberculosis cases in Timor-Leste are drug resistant (DR) or rifampin resistant (RR-TB) in previously treated patients. MDR-TB is estimated to be 3.1% in new and 15% in previously treated patients, while the proportion with XDR-TB is unknown.

The two most common problems in most of the locations were delayed treatment presentation and incomplete treatment. The main reason for the delay in presentation was a lack of understanding of TB, the stigma associated with the disease; unacceptable care, preference for private practitioners, and addresses inaccessible by transport, at certain times and The main reason for incomplete treatment is dissatisfaction with treatment and its delivery and inaccessibility of treatment. (Thomas et al 2002)

The National Tuberculosis Program (NTP) in Timor-Leste was established in 2000 through the Caritas Dili Non-Governmental Organization (NGO) and then submitted to the Department of Infectious Disease Control (CDC) of the Ministry of Health in early 2006. The role of NTP is to be responsible for developing policies, technical guidelines, and health system administration for tuberculosis control; both diagnostic and treatment services for tuberculosis are fully integrated into the public infrastructure of the Ministry of Health by using public health facilities. (Timor-Leste NTP 2014).

DOT is the basic minimum requirement for TB control. This strategy has been adopted in many countries with flexibility and adaptation to the needs of existing communities. All 22 countries with high burden of TB cases have implemented Direct observation of treatment (DOT) strategy since 2000. A cumulative total of 37.3 million and relapse cases have been treated in DOT strategy over 13 years (1995-2007).

Direct observation of treatment (DOT) strategy, applicable for the full duration of treatment of TB patients in Timor-Leste on the adult regimen as well as for the pediatric regimen; therefore trained health staff or community volunteers observe patients ingesting tablets, and should discuss the various options for treatment monitoring facilities (DOT centers) with the patient and the patient should choose the most convenient and accessible DOT site.

Patients with tuberculosis disease should follow the recommended course of treatment and must complete it in a timely manner to cure the disease, avoid drug resistance, protect the public by reducing future transmission of the M. tuberculosis strain, treatment failure or relapse after completion. Ensuring patient compliance with treatment can be difficult because treatment for tuberculosis disease requires many

medications that are taken for at least 6 months. It is important that healthcare workers help patients comply with treatment because failure to do so can have serious consequences.

Ending the tuberculosis epidemic is one of the targets of sustainable development goal (SDG), The head of state and national representative were discussing at the UN high level meeting on TB on 26 September 2018 to end the global TB epidemic, by the SDG deadline of 2030. With a timely diagnosis and treatment with first-line antibiotics for 6 months, most people who develop TB can be cured and onward transmission of infection curtailed.

2. Methodology

Study setting

This study was conducted at the eight-health facility that provided DOTs in Dili, Municipality of Timor-Leste.

The intervention and implementation strategy

The DOT strategy was applied to all types of TB cases with a confirmed TB diagnosis. For patients diagnosed in a hospital, TB therapy based on DOT starts at the hospital and is given while in hospital, the patient will continue his treatment at a health facility that provides DOT close to his place of residence (according to referrals from the Hospital).

Whereas patients diagnosed in health facilities are offered DOT-based care in health facilities or therapy is carried out at home and in the community, with the provision of DOT services by PSF or others such as by peripheral health workers or DOT observers such as: community leaders, teachers, catechists, pastors, village heads, political figures, traditional healers, women's groups or family members and trained community volunteers; Because TB cure is very dependent on direct observation of treatment (DOT) for 6 months of drug regimen.

Study design

This study used a mixed method explanatory sequential design, which involved quantitative study followed by qualitative study. We have chosen mixed method explanatory sequential design because the qualitative is needed to explain quantitative findings. The study starts with a cross-sectional survey to assess patient's characteristics, patient's adherence to treatment, and providers' compliance towards implementation of DOT.

Conceptual framework This study was guided by the conceptual model for implementation fidelity from Carroll et al 2007. All components of adherence to DOT guideline (coverage, content, frequency, and duration), and the moderating factors, which comprise intervention complexity, facilitation strategy and quality of delivery were measured. Coverage is defined as characteristics and proportion of TB patient actually received DOT according to the guideline. Content is defined as compliance to the national guideline of TB management, i.e. provide correct dosage and correct regimen and ensure continuity of treatment. The DOT guideline also recommends that providers help patients comply with the treatment regimen as much as possible through education of patients and their families, providing nutritional support and addressing social determinants of TB such as stigma, social isolation, interruption of studies, loss of employment and other negative consequences of TB. Frequency is defined as interval between DOT visit, and duration is defined as the length of time of which DOT was provided to the patient.

Three moderators that may influence the degree of fidelity were defined as follow: 1. Intervention complexity was defined as existing barriers in program delivery; 2. Facilitation strategy was defined as any strategies to optimize implementation; and 3. Quality of delivery was defined as quality impact score measured using the QUOTE TB light and In the second phase of the study, we employed a thematical study to describe in detail about the experience of TB patients and healthcare staff during program delivery and explain findings from the previous quantitative

survey, as well as to explore barriers and enablers of implementation of DOT service, as perceived by both TB patients and service providers.

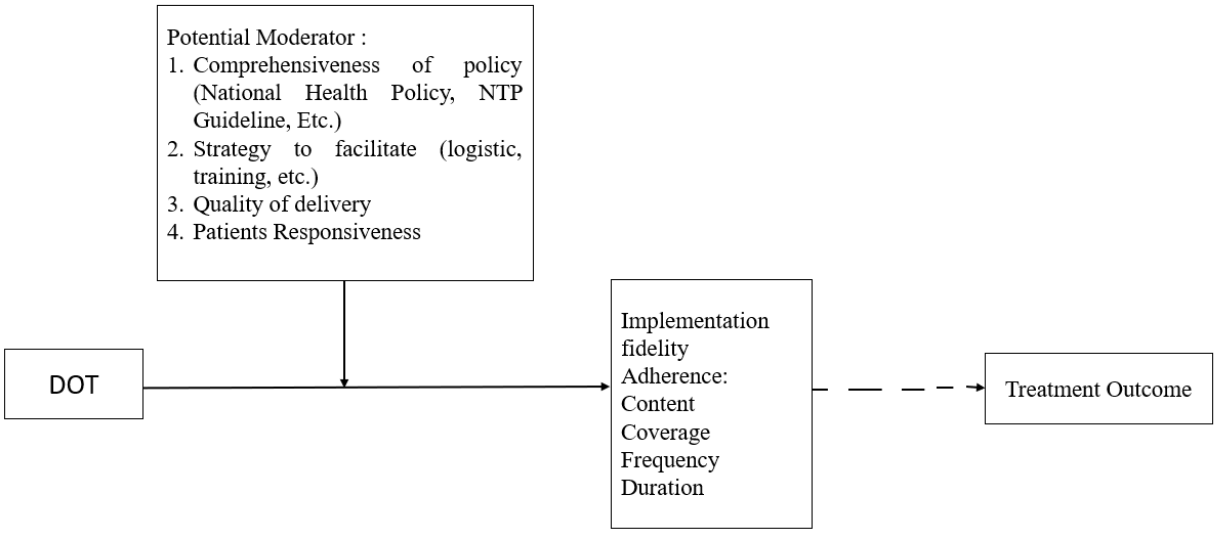

Figure 1. Conceptual framework

Study participants and sample size

The quantitative study included all TB patients who completed treatment in the study period (May-July 2020) in eight health facilities providing DOT services in Dili municipality such as; CHC Atauro, CHC Becora, Clinic Bairo-pite, CHC Comoro, CHC Formosa, CHC Metinaro, clinic Motael, and CHC Vera-Cruz.

Total sampling was carried out for 3 months and we enrolled a total of 302 TB patients who completed treatment, of which 181 were willing to participate, Where 60 of these patients were not willing to participate in the study, 7 were minors and had died, and 47 others could not be contacted because they had changed addresses and returned home.

Participants for the qualitative study depended on whether they were willing to participate in TB patients who had completed treatment and the health staff who provided DOT services at the eight health facilities in Dili as well as the district level NTP coordinator.

Data collection and analysis

A structured questionnaire was administered to TB patients to measure the key components of adherence: implementation content, coverage, duration, dose, and frequency; and quality of TB care service delivery. Questionnaire adapted and developed from QUOTE TB Light tool, this is a questionnaire for measuring the quality of TB care service delivery based on nine quality dimensions such as: 1. Communication and personal information; 2. Professional competence; 3. Availability of DOT TB services; 4. Patient-Provider interaction and counseling; 5. Support; 6. Affordability; 7. TB-HIV; 8. Infrastructure and 9. Stigma.

In quantitative phase, questionnaire survey was conducted directly by researcher in the eight-health facility. Each questionnaire took about 20–25 min to complete. Returned questionnaire was then checked for completeness and double entered into

an EpiData© (Version 3.1) database. We have cross-checked their treatment card and record book. We also verified the phase of the patient treatment by checking the TB register.

Descriptive analysis was applied to analyze quantitative data in the form of a frequency distribution and summary statistics. QUOTE TB LIGHT is an acronym for "Quality of care as seen through the Eyes of the Patient", the QUOTE TB LIGHT tool is ready to use since it was already tested quantitatively and validated through statistical analysis by TB CAP, in collaboration with KNCV at Uganda and Netherlands Institute for Health Research (NIVEL). These scores are calculated by combining the importance ranking based on health staff's opinion and average performance scores according to patients' survey. The higher of QI score, the more need for improvement. In general QI scores above 0.75 indicates that improvement is possible and may be necessary. A cutoff point was established to define the degree of implementation fidelity of DOT based on the percentage of maximum score achieved in relation to the expected total score for each sub-dimension: < 40% - Not implemented (Poor); 40 to < 75% - Partially implemented (moderate); and > 75% - Implemented (good).

In the qualitative phase, a total of 23 semi-structured In-depth interviews were conducted using the local language (Tetum) and all interviews led by the principal investigator. Interviews with patients and Health workers are carried out at home, in health facilities and by telephone, they are related to log down during the Covid 19 pandemic. Informed consent was obtained from all respondents before the interview. We ask to be open questions, raises the experience of each respondent in receiving or delivering DOT. This qualitative research has assisted in quantitative methods by identifying barriers and facilitator in DOT delivery to assess the four components of compliance and moderating factors. A number of the question still uses an open qualitative method so that the patient can explain in detail. All interviews are digitally recorded and hand notes made by the investigator. All interviews are transcribed orally by the researcher and then translated into English. Qualitative data analysis was carried out using Nvivo 12 version software to generate data code, theme and subtheme.

Ethics consideration

The protocol was reviewed by Ethical committee of faculty of medicine Universitas Gadjah Mada, Indonesia and obtained Ethical clearance and research permission Ref. no: KE/FK/0576/EC/2021. The protocol was further reviewed by research ethics Instituto Nasional de Ciancia de Saude Timor-Leste (INS-TL) and ethical approval certificate Ref. no. 365/MS-INS/DE/V/2021 was obtained from INS-TL.

3. Result and Discussion

There are eight health facilities that provide DOTs services in the municipality of Dili; CHC Atauro, CHC Becora, Bairopite Clinic, CHC Comoro, CHC Formosa, CHC Metinaro, Motael Clinic, and CHC Vera-Cruz. Participants were 181 of 302 patients who had completed tuberculosis therapy in three months (May-July 2020). Where 60 of these patients were not willing to participate in the study, 7 were minors and had died, and 47 others could not be contacted because they had changed addresses.

Subject Characteristics

In the cross-sectional survey, we have total of 181 TB patient participated in this study, in which 65.7% (119) are male and 34.3% (62) are female. of the total patients willing to participate in the study. Almost all 145 (80.1%) respondents are in the productive age between 18-49 years and 19.8% are over 50 years old or more, with most of them have completed secondary education (35.9%) and 18.2% have no formal education. On the other hand, most of the respondents, 63.5% are married and of them live in rural areas when they are sick.

Of the 181 patients who completed therapy in the study period, 159 (87.8%) were pulmonary TB (PTB), and 22 (12.1%) were extrapulmonary TB.

Table 1. Patient characteristics (n = 181) in eight health facility Provided DOTs in Dili municipality.

Variables		N (%)	Atauro	Becora	Bpite	Comoro	Formosa	Metinaro	Motael	VC
Age	18-49 year	145 (80.1%)	4	13	31	24	19	3	30	21
	>50 year	36 (19.8%)	1	6	11	7	2	0	9	0
Gender	Male	119 (65,7%)	4	13	26	22	14	2	26	12
	Female	62 (34,3%)	1	6	16	9	7	1	13	9
Marital Status	Single	50 (27,6%)	2	9	5	7	8	2	10	7
	Married	115 (63.5%)	3	8	32	21	13	1	24	13
	Divorced	2 (1,1%)	0	0	1	1	0	0	0	0
	Widower	14 (7,7%)	0	2	4	2	0	0	5	1
Residence	Urban	32 (17,7%)	0	4	5	5	9	0	6	3
	Remote	115 (63,5%)	1	11	25	20	11	0	32	15
	Extreme Remote	34 (18,8%)	4	4	12	6	1	3	1	3
Educational Level	Illiterate	33 (18,2%)	1	5	8	7	4	0	5	3
	Primary School	11 (6%)	2	2	3	1	0	1	0	2
	PSS	17 (9.3%)	0	4	2	3	2	0	2	4
	SS	65 (35,9%)	2	3	19	10	9	0	20	2
	University	55 (30,4%)	0	5	10	10	6	2	12	10
Occupation	Unemployed	68 (37.5%)	2	6	18	7	9	3	14	9
	Employed	41 (22.6%)	1	4	14	3	5	0	10	4
	Private Employed	45 (24,8%)	0	4	5	16	3	0	12	5
	Students	27 (14,9%)	2	5	5	5	4	0	3	3
Type of TB	PTB	159 (87,8%)	5	16	35	28	19	2	34	20
	E-PTB	22 (12,1)	0	3	7	3	2	1	5	1

Patients Adherence and service providers compliance toward treatment under DOT

The survey results found that the newest cases of TB patients were 165 (91.1%), while retreatment cases were 16 (8.2%), and MDR 1 (0.5%). The implementation of the DOT strategy in health facilities was offered for all existing types of TB.

DOT coverage in Dili municipality is 26.5%, while home based DOT is 55.8%, and Ambulatory DOT is 17.6%; With the highest in Bairopite Clinic (15%), and the smallest in Metinaro health center (1%). In the intensive phase, only 15.5% of patients were treated with the DOT strategy; Most in Comoro and Vera-Cruz (8%) compared to other DOT providers. Of which only 8.3% continued DOT in the continuation phase.

The frequency of taking TB drugs was found daily for all patients (100%), with or without DOT monitoring, according to the dose determined by body weight; ranging from 30-39 kg 2 tablets, 40-54 kg 3 tablets, 55-70kg 4 tablets and 70 and above 5 tablets, with a duration of 6 months for new cases and retreatment and 20 months for MDR cases. Most patients took medication at the health facility every week 125(69%), while 45(24.8%) came daily to the health facility for DOT. With a treatment duration of 6 months for new cases, 8 months for relapse and failure and 20 months for MDR cases; The majority of patients in this study completed therapy within six months (91.1%).

Table 2. DOTs adherence (frequency, coverage, dosage and duration) and service providers compliance. (n = 181)

Variables	Type Measurement	Total (n %)	Atauro	Becora	Bpite	Comoro	Formosa	Metinaro
Frequency	Daily	24.8	1	4	13	5	10	1
	Three times a week	3,8	0	2	2	0	0	0
	One times a week	69	4	11	27	25	11	2
	Monthly	2,2	0	2	0	1	0	0
Coverage	Health facility	26,5	2	4	15	5	10	1
	Home based	55.8	0	13	25	25	9	0
	Ambulatory	17,6	3	2	2	1	2	2
Duration	Yes	25.4	2	4	13	5	10	1
	No	45.8	2	9	19	19	5	0
	Sometimes	28,7	1	6	10	7	6	2
DOT intensive Phase	Self	47,5	3	11	21	10	13	2
	Family member	36.6	1	4	17	12	6	1
	Health staff	15.5	1	4	4	8	2	0
DOT continuation Phase	Self	55,2	4	16	29	11	9	3
	Family member	36,5	1	3	10	16	10	0
	Health staff	8,3	0	0	3	4	2	0

Quality of TB care service delivery

QUOTE TB LIGHT is a management tool to help national TB program to assess the quality of TB service through the eyes of the patients.

1. The Importance Ranking of the nine (9) Quality dimension.

In the following Table will be shown the importance ranking of quality dimension of TB control according to individual IDI to TB staff in eight health facilities in Dili municipality. The result showed communication and information and support as the most important quality dimension with an average score of 8.2 (92%), and patient provider interaction and counseling at least important with an average score 8 (88,8%). The last ranking is stigma with average 1.7 (19%).

Table 3. Ranking of nine quality dimensions for TB care by HCP

	Ranking by Health care Providers									
Quality sub-dimension	**Atauro TB staff**	**Becora TB staff**	**BP TB staff**	**Comoro TB staff**	**Formosa TB staff**	**Metinaro TB staff**	**Motael TB staff**	**VC TB staff**	**Average**	**%**
Communication and personal information	9	9	8	8	7	9	9	7	8.2	92
Professional competence	6	6	5	5	4	6	4	5	5,1	57
Availability of TB-DOT service	6	6	5	5	5	5	5	5	5,2	58
Patient Providers interaction and Counseling	7	7	8	8	8	8	9	8	7.8	87
TB/HIV	2	4	5	4	5	4	4	3	3,8	42
Support	9	9	8	8	7	9	7	9	8.2	92
Affordability	3	1	2	2	1	2	3	2	2	22
Infrastructure	9	5	5	5	7	6	8	5	6,2	69

Stigma	2	2	2	2	1	1	2	2	1.7	19

2. Performance and quality impact (QI) score of the care

We use the calculation of the performance score (P) and importance (I) to determine the service quality score, which in this study was called quality impact (QI). The performance score was the percentage of patients who answer question with negative answer, while the importance score was the percentage of health providers who think it was very important. The quality impact (QI) score was obtained by multiplying the performance score and importance score divided by 1000. If QI score is about 1, it was necessary to improve services. A maximum score of 10 indicated that 100% of patient perceived the poor performance of these aspect of TB care. The higher QI value the higher needed for improvement.

In this study we found mean of QI score as 7, 6.7, 6.3, 6,5.6, 5.5, 5.4,4.8,3.6 from the communication and personal information, support, professional competence, infrastructure, HIV-TB relationship. The nine dimensions of the quality of TB care service delivery perceived by patients are described in detail as follows:

1) Communication and personal information

The data shows that the eight components in this dimension need improvement because the QI score is above 0.75. with each regular DOT 7, store drugs 5.6, infectiousness 5.5, regular sputum 5.4, side effects 4.8, curability 2.4, next visit 1.3 and duration treatment 1.1.

2) Professional competence

Seven questions were asked to assess the professional competence of health workers perceived by TB patients towards service providers. except for home therapy with QI (5.5) needing improvement, all the other six components just need to be maintained because the QI is still below 0.75.

3) Availability of TB service

The data shows that most of the participating patients perceive that the same provider is a component that needs to be improved in this dimension. with the highest QI in this dimension, namely (2.3). while other components that are also used in testing this dimension have an average QI value below 0.75.

4) Patients provider interaction and counseling

Patient provider interaction and counseling is important with a second rating (87) perceived by DOT providers. The six components used in assessing this dimension, apart from respect and discrimination with (QI >0.75), other components such as listen carefully, explain think, sufficient time for discussion, and deal with problems still need to be improved.

5) TB-HIV relationship

Data analysis showed three components of the five needs to be addressed, namely the relationship between TB-HIV (QI 2.7), preventing HIV (QI 2.4), HIV testing (QI 3.6), and TB affecting life (QI 2.5). this dimension has been rated (42%) by the service provider.

6) Support

The services provided are rated 92% for patient support considered most important, the same; patients also feel that this dimension is very important. Of the three components used to access support; incentive (QI 6.7), food (QI 5.6) and visit or delivery medicine (6.3). Thus, it can be concluded that this dimension needs improvement for the success of DOT implementation.

Previously, PSFs who served DOT at home were given an incentive of $60, for a target of one patient until completion of treatment. on the other hand, patients are also given a monthly payment of $30 for those who are considered less fortunate who are willing to take care at a health facility. This program has been stuck since 2018. (HCP(A))

7) Infrastructure

Infrastructure is one of the dimensions of quality of TB care that is considered important by DOT providers (69%), but according to the perception of 85/6% of patients, what needs to be improved in this dimension is the component of drinking water supply, namely (QI 5.9).

8) Affordability

TB services are provided free of charge to all East Timorese in the country, including medicine and other logistical needs. Only transportation cost (QI 1.2) needs to be improved. around 57% of the TB patient felt that cost of transportation prevents them from getting to the health facility, which is ranked 22% of importance score by services provider.

9) Stigma

This is the lowest ranking (19%) among the nine dimensions of quality of TB care and is considered of least importance. most TB patients feel that all health facilities are performing well with respect to stigmatization, they feel they are not discriminated against. there are no components that need to be corrected in this stigma dimension, all components show a QI below 0.75.

Table 4. Performance, Importance and Quality Impact (QI) Score of the care

Dimension aspect	Importance Score (%) I	Performance Score (%) P	Quality Impact (QI) (IxP/1000)	Atauro	Becora	Bpite	Comoro	Formoza	Metinaro	Motael	VC
Communication and personal information											
Infectious ness	92	60.2	5. 5	3	14	24	12	18	3	18	17
curability	92	27	2,4	0	7	12	6	6	0	10	8
Regular DOT	92	76,7	7	4	17	32	16	17	3	25	18
Side effect	92	52,4	4,8	3	12	17	13	14	3	18	15
Regular sputum test	92	59,6	5,4	5	13	21	15	13	3	22	16
Duration treatment	92	12,7	1,1	0	2	6	3	4	0	4	4
Store drugs	92	61,8	5,6	5	15	23	16	18	3	17	15
Next visit	92	14,9	1,3	1	2	8	4	3	0	5	4
Professional Competence											
Laboratory services	57	0	0	0	0	0	0	0	0	0	0
Home-Treatment	57	96,1	5.5	5	17	40	30	21	3	38	20
Physical exam	57	1	0,05	0	0	1	0	1	0	0	0
Sputum examined	57	3,3	0,1	0	1	4	0	1	0	0	0
Days result	57	2.2	0.1	1	1	0	1	0	1	0	0

Contact examined	57	2,2	0,12	5	19	27	16	17	3	21	19
Treatment observer	57	11.6	0.7	2	3	5	2	4	1	2	2
Availability of TB service											
Waiting time	58	1.1	0,06	0	0	1	0	1	0	0	0
Same providers	58	39,7	2,3	5	16	10	8	14	3	9	7
Convenient hours	58	0	0	0	0	0	0	0	0	0	0
Drugs available	58	0	0	0	0	0	0	0	0	0	0
Language barrier	58	0	0	0	0	0	0	0	0	0	0
Other health care	58	0	0	0	0	0	0	0	0	0	0
Easy to reach	58	12,1	0,7	4	3	3	6	0	0	2	4
Provider available	58	0	0	0	0	0	0	0	0	0	0
Patients- Providers Interaction and Counseling											
Respect	87	10,4	0.9	0	2	5	3	5	0	2	2
Listen carefully to me	87	15,4	1,3	2	3	6	6	3	1	3	4
Explain thing	87	13,8	1,2	1	3	4	4	5	2	2	4
Sufficient time for discussion	87	18,2	1,5	1	6	10	5	7	0	3	1

Deal with problems	87	20	1.7	2	4	9	7	6	0	6	2
Discrimination	87	0	0	0	0	0	0	0	0	0	0
TB-HIV Relationship											
Link TB and HIV	42	66	2,7	5	13	24	23	13	3	26	12
Prevent HIV	42	59	2,4	5	18	32	14	9	3	18	8
HIV test	42	87,3	3,6	5	17	39	25	19	3	33	17
Availability of ART	42	0	0	0	0	0	0	0	0	0	0
Privacy respected	89	5,5	0.5	0	09	0	1	0	0	0	0
TB affect life	89	29,2	2,5	2	11	8	7	9	2	7	7
Support											
Incentive	92	72.9	6.7	5	17	29	21	13	3	29	15
Food	92	60.9	5.6	5	15	28	19	10	3	19	11
Visit/delivery Medicine	92	69	6.3	4	16	24	27	19	1	16	18
Affordability											
Cost for Transport	22	57	1.2	4	16	18	22	16	1	15	11
Infrastructure											
Drinking water	69	85,6	5,9	5	19	37	30	20	3	30	11
Usable toilet	69	5,5	0,37	0	2	5	1	1	0	1	0

Waiting area	69	4,8	0,3	0	4	0	5	0	0	0	0
Cough priority	69	5.5	0.37	0	3	2	2	2	0	0	1
Stigma											
Equal treatment	19	7,7	0,14	1	3	2	3	2	1	1	1
Friendly	19	3,3	0.06	0	0	3	0	2	0	0	1
Direct Communication	19	5,5	0,1	1	2	2	1	3	0	0	1
Dignity	19	0	0	0	0	0	0	0	0	0	0

Patients responsiveness

There are Three aspect of Patients responsiveness we have measured and describe above:

1. Perception about DOT

In accordance with the four questions asked to see perceived usefulness, 90% of patients felt that the DOT program was beneficial for them, only 10% of people felt that TB services had not been used to their full potential. Similarly, 90.6% of patients felt that DOT could prevent contracting TB. the majority (59.6%) of the participants in the study felt that DOT is useful in the future; However, 69.6% of these patients felt that they did not gain knowledge from the treatment program using the DOT strategy.

2. Engagement

Here we can see that most of the patients (61.3%) were willing to take care without coercion from others. However, it was found that 53.5% of the participants were generally not willing to participate in discussions about TB, 74% felt they were not informed about the importance of DOT as a TB treatment strategy. In addition, 73.4% stated that communication during DOT was insufficient.

3. Group Environment

Six questions were asked to see how they felt about the environment during DOT treatment. Most patients feel that health workers support them by treating them well, giving them the opportunity as patients to ask questions, and showing empathy during their treatment. It's just that most (75.6) did not discuss with family members or other people about TB-DOT.

Table 5. Participant responsiveness

Variables	Possible response	Total n (%)	Atauro	Becora	Bpite	Comoro	Formosa	Metinaro	Motael	VC
Perception about DOT										
1- DOT is use full for you	Yes	163 (90%)	5	17	37	28	20	3	34	19
	No	18 (9.9%)	0	2	5	3	1	0	5	2
2- DOT prevent you from TB	Yes	164 (90,6%)	5	17	38	28	20	3	34	19
	No	17 (9.3%)	0	2	4	3	1	0	5	2
3- Gain knowledge from DOT	Yes	55 (30.3%)	2	7	12	8	5	2	13	6
	No	126 (69.6)	3	12	30	23	16	1	26	15
4- DOT is useful in the future	Yes	108 (59.6%)	4	12	21	22	13	3	24	9
	No	73 (40.3%)	1	7	21	9	8	0	15	12
Engagement										
1- Join discussion	Yes	84 (46.4%)	2	10	19	11	11	3	19	9

	No	97 (53.5%)	3	9	23	20	10	0	20	12
2-Voluntary accept DOT	Yes	111 (61.3%)	4	12	26	19	10	3	26	11
	No	70 (38.6%)	1	7	16	12	11	0	13	10
3-Enough communication during DOT	Yes	48 (26.5%)	1	7	10	9	7	2	9	3
	No	133 (73.4%)	4	12	32	22	14	1	30	18
4-Health staff inform about DOT	Yes	47(25.9 %)	1	7	10	9	6	2	9	3
	No	134 (74%)	4	12	32	22	15	1	30	18
Group Environment										
1-Treat nicely during DOT	Yes	177 (97.7%)	5	19	41	31	19	3	39	20
	No	4(2.2)	0	0	1	0	2	0	0	1
2-Show empathy	Yes	166 (91.7%)	4	17	38	29	19	3	37	20
	No	15 (8.2%)	1	2	5	2	2	0	2	1
3-Given chance to ask	Yes	63 (34.8%)	1	10	18	8	7	3	9	7
	No	118 (65.1%)	4	9	24	23	14	0	30	14
4-Disccus with family or other	Yes	44 (24.3%)	2	6	8	5	9	0	9	5
	No	137 (75.6%)	3	13	34	26	12	3	30	16
5-Health staff support	Yes	161 (88.9%)	4	17	38	27	18	3	35	19
	No	20 (11%)	1	2	4	4	3	0	4	2
6-Health staff Encourage you	Yes	163 (90%)	5	17	38	27	18	3	36	19
	No	18 (9.9%)	0	2	4	4	3	0	3	2

BARRIER AND ENABLERS OF DOT SERVICE

We conducted in-depth interviews with patients and the health staff and TB program managers in the 8 health facilities who provided a DOT strategy for treating TB patients in the municipality of Dili, and one program officer in Dili and NTP officer Timor-Leste, to explore factors affecting for patients adherence and compliance as perceived by the service provider.

The transcribe was coded as per givens answers by respondents, generating major themes and sub-themes, description of identifies barriers and enablers from eight health facility.

A. Barriers and Enablers of Dot as Perceived by Service Provider and National Tuberculosis Program

1. Barriers of the DOT service

a. Service Provider Compliance to DOT

Therapy for all types of TB in Timor- Leste is not carried out strictly according to the existing NTP-TL guidelines, namely all patients generally have to come to a health facility every day for direct observation. Based on our experience in providing DOT services for tuberculosis patients over the past few years, the main factor causing our non-compliance with the guidelines for implementing DOT strategies is that patients are not willing to come every day to health facilities for DOT, this is because the patient's residence is far from the health facility that serve DOT, they do not have money to pay for transportation every day back and forth for 6 months of treatment. Other factors found are culture; there are still many patients who believe that disease is a curse, most patients have to go home to do traditional events for a few days, and will stop doing therapy when there are no more symptoms of the disease.

Many patients are not willing to come daily to a health facility for DOT, because far away there is no transportation cost. many believe in culture. (Male service provider(f&a)).

In addition, other factors that prevent us from complying with the DOT strategy are the daily activities of the patient; some patients have to go to work out of town for a certain amount of time, or work every day and some go to school.

If they come every day it interferes with their daily activities such as work and school. (Male service provider(c))

Health workers may not force patients to come every day to health facilities for DOT, but always try to convince patients to complete it according to the guidelines for TB care, which is six months; even if the therapy is done by yourself or family members. In this case, it is considered that the importance of communication is needed in providing information to patients and their families about the disease they are suffering from, their treatment strategies and the prognosis of the disease itself, after the patient is diagnosed with tuberculosis. Through this communication, the patient is given the opportunity to choose the part of the DOT strategy he wants according to his situation and condition, namely doing daily therapy to a health facility (DOT), therapy is carried out at home and monitored by family members. (home treatment), or therapy is done by yourself and once you have to go to a health facility for DOT (Ambulatory). ‘the most important thing is that the patient must perform therapy and complete it in a timely manner’.

The diagnosed patients, we inform them and their families, to do therapy every day at the health facility so that we observe them directly when taking the drug. But most choose to do the therapy at home, we can NOT force them to commute daily for DOT. (Male TB staff(A)).

We communicate with patients and their families about their illness and required therapy, and convince

patients to take the medication according to the dose and frequency given. a family member who helps watch her take her medicine at home. (TB male & female staff (b1))

The patient's address and telephone number need to be recorded properly and correctly in the clinic history to be used in monitoring and assisting patients during the treatment period at home. Although it is not effective for a certain period of time because of the internet network, patients are busy and do not receive calls, numbers die because they are changed and the last is patients move from their place of residence, such as those who live in boarding houses or rented houses.

To ensure that patients have to take their medication every day we monitor it via telephone; if our telephone calls are not served, the number is not active then we will look for it at the patient's house. the problem here is the patient changes address.

Those who disappear and do not come back to the health facility for treatment, we will search by telephone if they are not received/the phone is dead, then we have to go to their house according to the existing address but sometimes the patient changes address or goes out of town within a certain time. (TB staff (M)).

b. The Degree of DOT implementation

DOT was found to be only practiced when TB patients visited health facilities. The patient's willingness to come to the health facility every day for DOT only reached 2 to 4 weeks, after which the patient began to complain and asked to continue treatment at home. Once at home It is the patient's responsibility to continue treatment. The reasons include long distances to facilities, not willing to come every day due to financial constraints, conflict with school or work schedules, social behavior, believing that they have recovered because there are no more symptoms.

The patients only persisted in coming daily for DOT for up to 2 weeks and no later than 4 weeks. (Female DOT Provider(B)).

c. Factors affecting adherence to DOT

We found that There is only one DOT facility for each Sub-district, with services for 5-7 villages. the main factors influencing poor patient adherence to DOT as perceived by 8 DOT service providers and the NTP program were; patients are not willing to come every day for DOT because the distance to DOT facilities is far and patients do not have money to pay for daily transportation to health facilities. These factors are transportation problems, financial problems, lack of family support, and long duration of care. All of these factors were stated by all service providers at IDI. Other minor factors that they mentioned were other illnesses besides TB, poor health knowledge, lack of counseling for patients and their families, lack of communication during treatment and no proper system to monitor patient satisfaction with the services provided.

They cannot come to health facilities every day because they live far from health facilities; they have to walk every day 1-2 hours with a distance of approximately 3-5 kilos. and they don't have money to pay for motorcycle taxis. (TB staff(A))

Patients live far from health facilities, there is no money to pay for transportation to health facilities every day, this is the biggest problem that exists. …..” We do not yet have a method for evaluating patient satisfaction with our services. (Dili TB Officer)

The NTP program states that non-compliance factors can be caused by lack of incentives for DOT providers and patients themselves, lack of compensation for lost wages and transportation costs can also be due to social barriers, patients often visit traditional healers before seeking treatment at health facilities. Other factors such as the patient's socioeconomic condition, poverty or lack of support from family and society.

Another minor factor is the movement of the patient from one place to another.

Regarding incentives that may be given in other districts, Dili district is NOT given. (Dili TB Officer)

2. Enablers of DOT service

a. Comprehensiveness of policy

Through this thematic analysis, we found that the strategy carried out in the treatment of Tuberculosis in the Dili district was implemented in accordance with the national tuberculosis guidelines provided by the NTP-TL. There is no separate SOP maintained at each DOT center.

We have national guidelines for TB disease control for us to follow. (all DOT provider).

b. Facilitating strategy

The facilitation strategy provided by the National Tuberculosis Program (NTP) to health facilities in implementing the DOT strategy is to improve the quality of DOT services by facilitating training for health staff; doctors, nurses, field and laboratory staff. Dissemination of information for new findings or new changes in guidelines. It was also found that each health facility was provided with a motorbike with 20 liters of gasoline per month, and telephone credit of $30 per month. As well as other logistical facilities related to tuberculosis control are provided by NTP.

To carry out this task properly, our facilities are given 1 motorbike, and telephone credit every month $60; $30 for laboratory technique and $30 for DOT provider. (Male TB staff(B)).

The facilities provided by NTP in implementing DOT are human resources like me, and other facilities needed in implementing DOT are always provided by NTP. (Male TB staff(M1))

c. Ways to improve DOT service

Thematic analysis shows that There needs to be a strong political commitment to support the TB program, DOT is enhanced if the government has such as allocating funds to prioritize the program by providing incentives to all TB patients, DOT providers and service providers as well. Another way to increase DOT is to create awareness, provide appropriate health education, counseling including patients' families and communities and provide support to underprivileged patients.

The Ministry of Health through NTP must continue to provide incentives to PSF or volunteers in the community to help us serve DOT in remote areas. It needs to be monitored and evaluated on a regular basis to identify errors to fix early. (TB staff (B1))

B. Barriers and Enablers of Dot as Perceived by TB Patients

Now we have analyzed patient IDI transcribed to hear from the patient's perspective, we have generated fallowing four major themes: factor affecting patient adherence to DOT, Degree of DOT implementation, service provider compliance to DOT, and ways to improve DOT.

1. Factor affecting patients' adherence to DOT

The factors that influence patients to NOT comply with DOT services are the difficulty of access to health facilities that serve DOT; it was found that most of the patients live far from health facilities that serve DOT, there are some villages that cannot be reached by wheeled transportation; they have to walk 2-3 hours daily for DOT, transportation costs.; A small number stated that the DOT schedule collided with work or school schedules, the number of health workers serving DOT was very limited, sometimes they had to wait a little longer for treatment, and Another problem mentioned was that health facilities do not provide drinking water, patients are required to buy or bring it from home.

Every day we have to pay for transportation to health facilities to take medicine, while we also need money

to buy food and other necessities in our household. why not just give the medicine to us to take it at home. (Male TB Patient(a&vc)).

We have to go to the health facility every day for treatment, what about our daily activities; Some of us work and some go to school. especially if we go there and wait a long time because only one person serves us. (Male & Female TB patient (m1&b2))

We had to buy drinking water or bring it from home because the health facilities did not provide it. (female TB patient (b1&c)).

2. DOT implementation

Through the patient's limited knowledge about the application of DOT, as well as their belief that the disease they are suffering from is a curse. Many stated that therapy for TB was important to break the chain of infection in the family and some said that health facilities were important, and most importantly they had to tell the disease well and honestly so that health workers could diagnose it correctly and provide appropriate therapy. corresponding.

Luckily, I came to the hospital for treatment, otherwise I might have died. I realized that I have to state my true disease to the doctor to tell what disease I have? (TB patient (m2)).

The medicine is given in a week or two, the DOT provider always convinces us to take it every day, even though we do it at our home. DOT providers only observe those who are willing to come to the health facility every day to take medication; while we they observe it once a week or two weeks when we visit the health facility to take medicine.

They only watch us when we take medicine in the health center. (all TB patient).

3. Service Provider Compliance to DOT

Patients felt the service providers compliance to DOT is better in terms of delivering service like health information, counselling about diseases, procedure in treatment and how to take medicine and all, though some stated there is bit lack of moral support from health providers side.

We were given information about the disease we were suffering from, the prognosis and the therapeutic strategy we needed to follow. The communication between us and the DOT server is going well, we really feel that they support us. (Male and Female TB patient (b1, c, f, m2)).

4. Ways to improve DOT

Listen and obey the advice given by health workers. Visiting health facilities every day to take medicine, or take medicine at home on time and regularly, perform health checks on time, eat nutritious food and get enough rest. Families and communities can also participate in providing moral and mental support during and during treatment.

The government needs to build/provide DOT services in rural communities so that they can be reached by the community in general.

Like it or not, I have to come to the health facility every day for treatment. (Male TB patient (m1)).

I think it would be better if DOT could also be implemented not only in sub-district health facilities but also in village offices so that it could be reached by the community. (Male &Female TB patient (m2&vc)).

Table 6. Barriers of DOT from both patients and provider perspective

Themes	Factor Affecting patient adherence to DOT	The degree of DOT implementation	Factor affecting adherence to DOT
Atauro	Live far from health facility No transportation There is no proper selection for DOT facilities and supporter	Once a week Eevery 15 days for those who want difficult to monitoring their treatment at home	only one DOT facility for sub-district transportation problems no incentive for PSF and patient
Becora	Transportation cost Not carried out strictly DOT guideline Patient resident is far No DOT volunteers (PSF) Patient daily occupation	once a week Eevery 15 days for those who want only possible for 3-4 weeks inadequate implementation of DOT	Long distance of DOT facility The relationship between DOT schedule with work and school schedule. Lack of M&E from NTP district
Bairopite	Long time of treatment Believe Existence of traditional therapy	Once a week Eevery 15 days for those who want difficult to convey DOT	Stopping take medicine after felling better
Comoro	No support from government Lack of economic condition Can't force them for DOT No money for transportation Long time of treatment	Once a week for those who want Eevery 15 days DOT occasional	Long duration of treatment Lack of support from family and government Financial problems
Formoza	Daily activity schedule No proper system to monitor patient satisfaction Patient daily activity	Once a week Implementation not picked up in a real sense for those who want Eevery 15 days	Difficult to convey Lack of follow-up Lack of communication
Metinaro	No home base DOT Only applied for those who come	Once a week for those who want Eevery 15 days Staff tend to ignore	Lack of education patient and family Lack of staff
Motael	Lack of HCP Lack of Health facility provided DOT Not willing to come daily	Once a week for those who want Eevery 15 days DOT is implemented, if the patient come to the health facility	Difficult to monitor home treatment No followed treatment at home

Vera-Cruz	Long time of treatment Difficult to come every day No drinking water in health facility Disappeared Long distance of health facility	Once a week for those who want Eevery 15 days Not fully implemented in the facility	Not willing to come for daily basis Patient economic condition Stopping take medicine after felling better Lack of communication

Table 7. Enablers of DOT service from both patient and service provider perspective

Sub-themes	Comprehensiveness of policy	Facilitating strategy	Ways to improve DOT service
Atauro	NTP guideline	Provide incentive will increase patient adherence to DOT Payment for PSF	Help from PSF Incentive would help better adherence Provide transportation to the health facility
Becora	NTP guideline	Payment for PSF Reactive PSF	PSF should participated more Take medicine regularly
Bairo-pite	NTP guideline	Financial support Food support	Financial and nutritional support Let the patient know TB is curable
Comoro	NTP guideline	Reactive PSF Food and financial support	Routine M&E Health education about TB Foods support
Formoza	NTP guideline	Reactive PSF Training for all professional health worker in the facility about TB program management	Routine M&E Provide training for health staff
Metinaro	NTP guideline	Financial support Reactive PSF	Routine M$E Provide detail instructions

		DOT provide in health post	
Motael	NTP guideline	DOT needs to be given also in HP	Increase number of HCP
Vera-Cruz	NTP guideline	DOT provides in HP Training for PSF DOT needs to be given also in HP	HP also must be provided DOT Increase number of HCP

Discussion

From the research, it was found that in Dili municipality of Timor-Leste, DOTs are offered for all existing type of TB for the entire course of treatment, in accordance with the NTP TL guidelines adopted from WHO (NTP-TL 5ed 2020). The overall DOTs coverage was 26.5%, in the eight-health facility; Atauro provide 1.1%, Becora 2.2%, Bairopite 8.3%, Comoro 2.8%, Formoza 5.5%, Metinaro 0.5%, Motael 2.85 and Vera-cruz provided 3,3%. There for we concluded that DOT is implemented partially in the eight facility in Dili municipality, thus implementation fidelity of DOT provider is severe. Most of the patients who diagnosed with TB prefer to do therapy at home with self-monitoring and a small part by family members 56.9%, and a small portion 18.2% do ambulatory therapy (a week at home and once in a DOT facility).

The main reasons given by DOT service officers are; they only serve DOT for those who are willing to come to a health facility for DOT, they can't force patients to do DOT. The low DOT coverage is due to the low adherence of health care providers to the NTP guidelines and because of its implications for TB patients, such as social and economic problems. the implication is that patients do not want to come for DOT every day mainly because of the distance to the facility, where they do not have money to pay for daily transportation.

A study conducted in Bhutan in 2017 by Dorzi et al.,by assessing DOT provider compliance with guidelines in two hospitals providing DOT services for tuberculosis patients, also found that factors influencing patient non-adherence to DOT were patience, and patients were unwilling to come every day because their homes were far from the facilities providing DOT and lack of family support. Almost the same as the results of this study, the factor that influences patient non-compliance with DOT is that patients cannot come every day to the DOT service facility because they live far from the facility.

Health care providers in the municipality of Dili, feel the importance of adhering to DOT practices and following NTP guidelines to achieve the goal of stopping TB. However, they cannot follow these guidelines because overall DOT is only implemented for those who are willing to come to the health facility every day; and DOT is only implemented in sub-district health facilities (No option), while home-based DOT and community-based DOT do not function because volunteers and PSF have not been given incentives by the government, in addition to the eight health facilities that provide DOT services there is no separate SOP set in their respective units, they follow very broad NTP guidelines.

Directed observed therapy means trained healthcare staff or community volunteers observe as the patient swallows the tablet. To that end, DOT should be decentralized to health posts and village levels, with peripheral health workers or other DOT observers

observing patients taking each dose of medication. DOT observers can be community volunteers, community leaders, teachers, catechists, pastors, village heads, political figures, traditional healers, women's groups or family members. These community volunteers can be trained and supervised by health staff so that they can oversee treatment for individual patients. (NTP-TL 5Ed 2020). Directly observed treatment (DOT) as the best curative method to stop the spread of TB in the community and now recommended as a standard of care in the treatment Tuberculosis worldwide By ensuring that patient take the right drugs, at the right intervals, and in the right dosages, DOT reduces the chances of relapse or failure and prevent multi-drugs resistant Tuberculosis. DOT needs to be given at a location which is convenient to the patient and by the treatment provider who is accountable to the health system. (WHO-Role of DOT 2009).

Barriers and enabling factor affecting DOT adherence

Barriers and challenges that affect patient adherence to treatment strategies found by health workers are; patients do not want to come every day to health facilities for DOT because the distance from home to health facilities is far! lack of transportation and financial costs and lack of support from family. Other obstacles found were lack of knowledge and socio-cultural behavior such as stopping treatment after the symptoms of the disease disappeared, belief in nature with the presence of traditional medicine. In addition, another important factor that was found from the patients was that the number of health facilities serving DOT was very minimal, namely only one polyclinic in each sub-district. DOT strategy is not implemented in the health post, and in the community.

The inaccessibility of health services, especially for those from remote areas, is reported to have a major impact on TB treatment adherence. This is the most prominent factor in developing countries where there is limited physical access to such services and poor infrastructure. in addition to the availability of DOT facilities, which are not in accordance with the total population, and most tuberculosis patients live in rural areas, other factors that also influence are the patient's occupation and schooling; patients must choose to work and go to school instead of having to go to a health facility every day for DOT, community-based DOTS is documented to have a major impact on increasing accessibility to clients. (Boru et al 2016). The study also shown that More than half of the clients in the study resorted to traditional healing system during or after their TB medication.

From an experiment conducted by Jamlick Karumbi in Nairobi, Kenya, finding that DOT does not provide a solution for poor adherence to TB treatment, the study recommends that policy makers may want to reconsider strategies that rely on direct observation. Another option might take into account finances and logistical barriers to maintenance; an approach that motivates patients and staff. (Jkarumbi and Garner 2015).

And Other factors also came from the characteristics of the sample, namely some of the participants who took part in the study came from 113 remote areas (63.5%) while only 17.7% lived in urban areas. The education level of the majority are high school graduates and dropouts, the last and most significant is the majority of unemployed (37.5%).

In a study conducted in India it was also found that; Supporting factors that influence DOT compliance are illiteracy, difficulty in accessing health facilities, and the lack of DOT centers. from this study it is recommended that DOT centers should be made more accessible and patients should be educated about TB and the importance of DOT. (Gopi et al 2007).

However, in the interviews conducted with DOT providers, they also mentioned that they tried to call patients who didn't drop in for DOT but mostly hung up or the number was off. So, have to look for it at home and in the end find the patient changing address, or going out of town.

Quality of TB care service delivery

In general, the quality of TB care service delivery is considered good, although there are several dimensions that need to be improved, such as communication and personal information, support, and HIV relationships. Another component that needs to be improved in the dimension of Quality of TB care service delivery is the provision of drinking water in health facilities, the same provider and therapy at home. And the dimension that needs to be maintained is stigma.

QUOTE TB Light is a method used by the National TB Program to assess the quality of TB services through the eyes of the patient. TB patients are one of the important groups to assess the quality of these services. The patient's perspective on the services received is an important element because it provides a clear indication of the problems that need to be addressed and can be used as a benchmark for improving TB services. Massaut et al 2009.

More than 60% of patients feel that they do not receive an explanation about the disease and its treatment, so communication and personal information must be improved. and 60-70% of them feel they need support, especially in terms of incentives, providing assistance in the form of food, and transportation services from the government. More than 85% feel that it is necessary to provide drinking water in health facilities that serve DOT. More than 80% reported not knowing the purpose of the blood test carried out during treatment, and 65% of them felt they were not informed about the TB-HIV relationship.

The same results were also found in a study conducted in Indonesia that accessed the quality of Tuberculosis services in urban areas by using the QUOTE TB LIGHT component. so, in this study the researcher suggested to DOT providers to pay more attention to this, because this would be effective in the end TB. (Rahayu et al 2020).

From the patient's acknowledgment regarding the absence of drinking water supply in health facilities, it is in fact true, DOT patients are required to bring drinking water from home; although the majority (96.1%) of patients do treatment at home because they do not get support from the government for transportation costs, or have to do daily routines.

These results indicate that the patients did not receive sufficient information during therapy for their disease, possibly caused by the lack of health facilities providing DOT providers, as well as the lack of DOT providers. In the case of TB-HIV, all patients are tested for VIH, but the patient does not know that the test is an HIV test, the patient will be notified if the result is positive. To explain this in TL the patient is very grateful if in the health service he is asked for a blood test. so, there is no need to do counseling to do an HIV test in TL.

Participant responsiveness

Participant responsiveness is assessed through 3 important things, namely; patient perception about DOT, engagement, and group environment. The survey results showed that only a small proportion of patients (30.3%) gained knowledge of DOT, while most of them (69.6) did not gain knowledge about DOT during treatment. The survey also found that 53.5% of patients did not discuss with DOT service providers during treatment, 73.4 complained about the lack of communication with DOT service providers during treatment and 74% admitted that they did not receive information about DOT. On the other hand (65.1%) patients also admitted that they were not given the opportunity or did not have the opportunity to ask questions during treatment.

The main reasons given were the lack of DOT service providers in health facilities, and the patient was not committed to treatment. With the number of patients, a day that does not match the number of DOT service providers, errors tend to occur because the division of work time is sometimes insufficient. the other thing is that when the person in charge is prevented from

coming to work, experts are taken by other people who are not experienced in DOT services.

In every health facility there is one person in charge of the TB program, everything related to TB is accountable to him except in the laboratory section where there are laboratory staff. (Dili TB Program Officer).

In a study conducted by Dalazoana and colleagues last March in Brazil, to analyze the performance and challenges faced by health workers in the use of DOT in tuberculosis, the results showed that users' lack of commitment to treatment (48.3%), professional difficulty to reach where patients are treated (8.8%), and lack of human resources (Dalazoana et al 2021).

Study limitations

We were unable to meet patients one by one because the country was in a log down to prevent transmission of the Covid 19, some patients were interviewed via telephone or video calls, therefore many patients were unwilling to participate and some denied identity.

4. Conclusion

In this study, we found that patient and service provider adherence to DOT is poor, therefore it is necessary to revise and define the DOT model and structure through the implementation of DOT in the health post. The key factors influencing poor adherence to DOT are; the patient is not willing to visit the health facility every day; due to the distance of residence to health facilities, financial implications and lack of support from family and government during treatment. quality of care service delivery is good, although there is still room for improvement such as the dimensions of communication and personal information, and support, as well as components from other dimensions such as the same provider during treatment, the availability of drinking water in facilities that serve DOT and home treatment. The patient's responsibility for treatment is still minimal. Therefore, we recommend increasing the number of HCPs, and it is necessary to provide DOTs in Health post to ensure that the DOT strategy is properly implemented according to the protocol.

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