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Relationship Between Drug Consumption, Supervisors' Knowledge and Support, and Patients' Obedience to Take Tuberculosis Drugs

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Abstract

Background*: Tuberculosis (TB) is a disease caused by Mycobacterium Tuberculosis generally attacking lungs, and the treatment is a minimum of six months. The recovery of TB clients requires adherence to medication treatment and Drug Consumption Supervisors (PMO).*

Objective*: This study aims to analyze the relationship between drug consumption, supervisors' knowledge and support, and patients' obedience to take tuberculosis drugs.*

Method*: This research employed a quasi-experiment with a total population sampling technique. The study was conducted in May-August 2019 in sector one, East Jambe, Karawang district (4 villages), and it employed 101 respondents of TB patients and 101 respondents of supervisors (family). Analysis in this study is used in the Spearman Rho Test.*

Result*: The supervisor analysis reveals that 71.3% of the supervisors are 25-49 years old, 59.4% of them are female, 80.1% of them are unemployed, 70.3% of them have low education, and 52.5% of them are married couples. TB patient analysis reveals that 59.4% of the patients are 25-49 years old, 63.4% of them are male, and 59.4% of them have new TB The level of supervisors' knowledge is good at 78.2%, and their support is good at 63.4%, while the patients' adherence to taking drugs is good at 93.1%. The relationship analysis reveals there is no relationship between the supervisors' knowledge and patient's medication adherence (p-value 0.13); otherwise, there is a significant relationship between the supervisors' support and drug-taking adherence (p-value 0.04).*

Conclusion: *The supervisors' knowledge does not affect adherence, but their support significantly influences the patients' obedience of taking TB drugs.*

Keywords*: Assistance; Drugs consumption supervisor; Healing; Obedience; Tuberculosis*

INTRODUCTION

Tuberculosis disease becomes a global problem, especially in developing countries such as Indonesia. TB is an infectious disease that primarily attacks the pulmonary parenchyma. The condition can also affect other parts of the body, such as brain membranes, kidneys, bones, and lymph glands. Tuberculosis is caused by *Mycobacterium tuberculosis*, which is categorized as an aerobic bacterium that is acid-resistant and usually spreads from person to person through droplets when he is talking and coughing (Black & Hawks, 2010).

The number of patients with tuberculosis in the world increases from time to time, in 2017 WHO Global Tuberculosis Report writes that Indonesia occupies the 2nd position for the world's highest TB cases after India (WHO, 2017). The data from the Ministry of Health of the Republic of Indonesia (2018) records that Indonesia has 360,770 TB cases

of all types in 2017. Meanwhile, Karawang, a region in West Java, occupies the highest TB cases among Indonesian subdistricts for 78,698 cases and 31,589 new cases. Most of the patients with tuberculosis are school-age period or productive ages (15-24 years old) for 14,163 patients. The recovery rate in West Java is still low for 40.80%, and complete treatment is only 59.20%. TB becomes the second most common disease suffered after diarrhea for 1,291 cases. The total of TB patients in East Telukjambe are 83 patients (12.97%), and East Telukjambe becomes the third-highest subdistricts with TB cases of 30 subdistricts in Karawang.

World Health Organization (WHO) and the Indonesian Government have conducted and applied various efforts and programs to eliminate the global TB epidemic in 2030 (WHO, 2019). There are three indicators related to the target; 1) The death amount of TB per year, 2) TB per year incident, and 3) Percentage of the household impact that experiences TB The target in 2030 is reducing 90% of death due to TB and cutting 80% of TB cases compared to 2015 (WHO, 2015). Meanwhile, the near term target is in 2020 by reducing 35% of death due to TB and 20% of TB incidences compared to 2015.

The government program to respond to TB, such as Directly Observed Treatment Short-Course (DOTS), aims to increase and expand the service of DOTS or a qualified tuberculosis countermeasure strategy to reach all tuberculosis patients and increase cases discovery as well as the success of treatment (Puspita, Yanti, Putri, Supriyanto, & Atiqah, 2019). One of the strategies is conducting Drug Consumption Supervisors (PMO) presence (supervision of drug swallowing) for each TB patient. The PMO can be from family, health officers, and health cadres, or social workers (Faizah & Raharjo, 2019). TB Prevention Program continuously improves. In 2018, the Government made a program called "Care for TB, Indonesia is healthy." The Government expects all parties and communities to actively participate in program known as Temukan Obati Sampai Sembuh Tuberkulosis (TOSS TB) movement or find and treat it to heal as an effort to prevent and control TB (Ministry of Health R.I., 2017). The program aims to investigate as many TB patients as possible and treat them to heal, and thus, the chain of transmission in the community can be stopped (Ministry of Health R.I., 2015)

TB disease can be cured by giving antituberculosis drugs, and the primary goal of the medication is to treat TB patients for at least six months (the medication must not stop). A person with TB symptoms is suggested to immediately undergo a medical check to investigate the possibility of suffering from TB (Ministry of Health R.I., 2015). Most TB patients who take antituberculosis drugs for two weeks have felt cured. Consequently, they often stop taking their TB drugs. Studies investigating 72 families of TB patients reveal the existence of a significant relationship between the self-efficacy of respondents and the role of a family to a TB drop-out event (Kim & Lee, 2017).

TB patients who break to take the medication are in danger of suffering from Multi-Drug Resistant Tuberculosis (MDR-TB). A study conducted at Dr. Moewardi Hospital Surakarta to 150 TB patients reveals that there is a significant relationship between the absence of supervisors of drug consumption and the treatment failure of MDR-TB events (Jufrizal, Hermansyah, Mulyadi, 2016).

Drug consumption supervisors have a role in succeeding in the cure of TB patients. A research conducted by Kurniasih and Sa'adah (2017) to TB patients in community health center (Puskesmas) of Ngawi reveals that there is a significant relationship between the supervisors' role of drug-taking and the patients' obedience to pulmonary tuberculosis treatment in Puskesmas of Ngawi. The cure rate indicates the percentage of bacteriostatic lung TB patients who recover after completing the treatment. The cure rate is employed to determine the outcome of the treatment. The compulsory minimum rate to achieve is 85%. Qualitative studies conducted on ten informants obtain that the level of healing and low success of TB treatment are related to patients' obedience to consume the drugs, and are influenced by knowledge and motivation, access to health, administration and finance, socio-cultural aspects, and other factors.

METHOD

This research was a quantitative study with quasi-experiment design. It employed a total population sampling technique. The respondents of this research were all TB patients in public health center

(Puskesmas) of sector one Eastern Teluk Jambe (including the areas of Pinayungan, Tanjung Pura, Wadas, and Sukamakmur village) who underwent TB treatment, had drug consumption supervisors known as PMO in Indonesia, and willingly participated as respondents. The samples of this research were 101 TB patients.

Puskesmas of Wadas had trained cadres of drug consumption supervisor whose job was to visit patients suspected of suffering from TB and provide assistance to have a regular medical check-up in Puskesmas. There were 7 cadres of drug consumption supervisor in a Puskesmas. Their job was to examine a new TB case in selected areas and to monitor TB patients to take the drugs. The cadres' regular meetings were conducted monthly. In addition, the cadres were trained to be an assistant in data retrieval. The data were collected by questionnaire composed by the researchers who had conducted a validity test. The result of questionnaire test shows that the value of Cronbach's Alpha is 0.844 with 25 questions. It Indicates that the questionnaire is reliable.

During the process, the researchers collaborated with Puskesmas of Wadas after completely receiving research consent from Badan Kesatuan Bangsa dan Politik (National Unity and Politics Agency) Karawang District and Head of Health Office Karawang District. The researchers held meeting with the nurses and doctors in charge of TB and cadres of drug consumption supervisors in Puskesmas of Wadas to gain the data of the patients who received treatment as the samples of the research. After the meeting, the researchers invited TB patients and drug consumption supervisors to attend a socialization program of TB held in the Puskesmas to get more detail comprehension of TB from the researchers.

The collected data were analyzed by utilizing difference testing analysis to determine the relationship between the supervisors' level of knowledge and support and the patients' adherence of TB drug, and the test was Spearman Rho. It is one of the nonparametric associative bivariate tests to examine the suitability between two variable groups derived from different subjects from the ordinal data scale (Hidayat, 2017). The Research conducted Ethical Eligibility Test with the number 046/KE/STIK-SC/XI/2018.

RESULTS

The characteristics of drug consumption supervisor respondents are based on gender, ages, level of education, and their relationship with TB patients as shown in Table 1. Meanwhile, the characteristics of patient respondents are based on age, gender, and length of suffering from TB as shown in Table 2.

Table 1. The characteristics of drug consumption supervisor respondents.

Characteristics	Total of Respondents	
	n	%
Age (year old)		
25-49	72	71.3
50-60	29	28.7
Gender		
Male	41	40.6
Female	60	59.4
Occupation		
Employed	20	19.9
Unemployed	81	80.1
Level of Education		
None	4	3.9
Low (Elementary-Junior high school)	71	70.3
High (>Senior high school)	26	25.8
Relationship with the Patients		
Husband/wife	53	52.5
Son/daughter	18	17.8
Parent	20	19.8
Sibling	10	9.9

Table 1 shows that 72 people are 25-49 years old (71.3%), 60 females (59.4%), unemployed 81 people (80.1%), low education level (Elementary-Junior high school) 71 people (70.3%), and a spouse (husband or wife) 53 people (52.5%).

Table 2. The characteristics of TB patients

Characterisitic	Total of Respondents	
	n	%
Age (year old)		
25-49	60	59.4
50-70	41	40.6
Gender		
Male	64	63.4
Female	37	36.6
Length of suffering from TB		
1-2 months	60	59.4
3-5 months	41	40.6

Table 2 shows the majority of TB patients 25-49 years old is 60 people (59.4%), 64 males (63.4%), and length of suffering 1-2 months is 60 people (59.4%).

Table 3. Drug consumption supervisors' level of knowledge level and support and Patients' level of obedience of drug taking

Characteristics	Total of Respondents	
	n	%
Knowledge of the Supervisors		
Good	79	78.2
Good enough	22	21.8
Support from the Supervisors		
Good	64	63.4
Good enough	37	36.6
Obedience to Take Medicine		
Good	94	93.1
Good Enough	7	6.9

Table 3 shows the majority of PMO have good knowledge levels in treating TB patients with total 79 people (78.2%) and give good support to 64 people (63.4%). The majority of obedience to take drug is good obeyed or 94 people (93.1%).

The correlation between the drug consumption supervisors' knowledge and support and the patients' obedience of drug-taking as shown in Table 4. Table 4 shows that the majority of supervisors, as many as 75 people, have good knowledge with good adherence. Statistically, there is no significant relationship between the supervisors' knowledge and the patients' obedience of TB drug taking since the P-value is 0.13 (> 0.05). Variable support shows that the majority of supervisors and patients, as many as 62 people, provide good support with good obedience. Thus, statistically, there is a significant relationship between the supervisors' support and the patients' obedience to taking a tuberculosis medication with a P-value of 0.04 (P < 0.05).

Table 4. Spearman Rho test result

	Good Obedience	Enough Obedience	Total	P-value
Good knowledge	75	4	79	
Good enough knowledge	19	3	22	0.13
Good support	62	2	64	
Good enough support	32	5	37	0.04

DISCUSSION

The Relationship between Knowledge and Obedience

This research statistically indicates that there is no relation between PMO knowledge and the obedience of taking the drugs in TB clients. It can be explained that the level of knowledge is only limited at the level of knowledge. The results of this research are supported by the research conducted by Herda, Tunru, & Yusnita (2018) investigating 45 patients with lung tuberculosis at Puskesmas of Baru Jakarta Pusat. The research reveals that the majority of the respondents have good knowledge (39.3%). However, there is no relationship between knowledge and the success of treatment (p = 0.069; p > 0.05).

In Psychology, one of the factors influencing behavior is cognitive. The knowledge factor relates to a person's belief to make justification or not. This result is not in line with that of Sutarto, Susiyanti, & Soleha's research (2019) investigating 44 PMOs of TB patients who undergo treatment at least 2 months. The research reveals that there is a relationship between the levels of knowledge of PMOs (p = 0.000) and the conversion of lung tuberculosis in Puskesmas of Bandar Lampung. A study by Arifin, Nur & Uzair (2019) investigating 80 patients with lung tuberculosis treatment in Puskesmas of Simpang Tiga Pidee, Aceh reveals that the variable supporting dominant information affects compliance with the DOTS strategy in lung TB patients with OR value = 3.5, and p value = 0.009. In addition, the previous study by Prameswari (2018) investigating 9 TB patients in RS X reveals that the implementation of DOTS has not been optimal, a political commitment is required to overcome the existing problems such as the absence of officers' training experience, the absence of TB units, overwhelming and double job description, bad microscopic examination, non-standardized antituberculosis drugs management.

A PMO family is expected to have a well-related knowledge in treating TB patients. Some researches illustrate the level of knowledge of TB clients, one of them is a research conducted by Gurning & Manoppo, (2019) in Papua Scoloo's Hospital which investigates 105 patients with drug-related pulmonary tuberculosis. The majority of the patients' education in elementary school (36.2%), they have good enough comprehension (52.4%),

and the majority of the patients are disobedient (53.3%). Good knowledge enables the family to provide good support to the other family members. Knowledge implemented in the form of support can increase the awareness of TB patients to obey the drug-taking, and thus, they can achieve healing and quality life. This argument is supported by Hariadi, Aryani, & Buston (2019) investigating 50 pulmonary TB patients who undergo treatment in the outpatient unit of a Puskesmas in Slebar District Health Centers Bengkulu. The research reveals that the majority of the family's support is good, the life quality of physical and mental condition is good, and the relationship is significant ($p < 0.05$).

Relationship between PMO Support and Patients' Obedience to Take Medicine

Program of health centres in the management of TB disease one of which is to involve the family as PMO, as well as in practice found in the health centres of Wadas village are obtained by all TB patients accompanied by at least one PMO. The designated PMO is the one staying with the patient. PMO criteria of this study correspond to a systematic review study by Putri (2019) who investigates 10 quantitative studies and 4 qualitative studies on PMO family. Their characteristics are over 17 years old, female, unemployed person, minimum education of senior high school, no relationship cohabitation, housemate, and jobless person. The role of PMO among others is to ensure that the patients swallow the drug daily, provide counselling, assist the medication process, give emotional support, and engage in patients' weight gain program.

The family approach is Puskesmas' strategy to improve health services for the community. As the main focus of health program implementation, family has a health care function: to maintain the health condition of the family members in order to escalate high productivity. Family is a support system for an individual (client). In addition, family can help the patients realize their needs and develop healthy ways to meet those needs. The most important part to consider, which is one of PMO programs, is that family has an important role in facilitating the patients to completely undergo the tuberculosis treatment (Ministry of Health R.I., 2017).

The success of the DOTS strategy is necessarily evaluated, research conducted by Reviono, Ramadhiana, Probandi, & Setianingsih (2019) in 158 hospitals in Central Java in the application of DOTS strategy, where the data came from the provincial health office of Central Java in 2013 and 2016. There are 110 hospitals with complete data. The study reveals that there is no significant relationship between commitment and organization of DOTS Hospital team, care, medical supervision, internal/external networks, and health facilities and the success rate of TB treatment ($p > 0.05$). The results of this research, which is conducted by taking samples of TB patients in the Puskesmas, is in accordance with those of several studies which prove that the role of PMO successfully supports the treatment of TB clients.

Research by Herda, Tunru, & Yusnita (2018) finds that 56 TB respondents (80.4%) in the Puskesmas Jakarta Johar Baru successfully undergo TB treatment, and PMO is instrumental in the treatment (71.4%). Yuda & Utoyo (2018) deploy that there is a significant relationship between the role of the Medical Care Supervisor (PMO) and the results of treatment TBC cured ($p = 0.000$) in Puskesmas of Gombang II, and the researchers recommend for improving the role of PMO in treating pulmonary tuberculosis patients.

TB patients need long treatment for at least six months because TB drugs must be able to kill both the active and inactive (dormant) TB bacteria and prevent the resistance. The main requirement for therapeutic success is the obedience to consume the drug. Obedience means that patients follow or obey the clinical recommendation from the health officers (Neil, 2002).

The results of this study show that (1) in variable support, the majority of the support is good with good compliance from 62 people (61.38%), and (2) statistically, there is a significant relationship between PMO's support and the observance of TB drug donor with a p-value is 0.04 ($p < 0.05$). This research is in line with research by Wulandari (2018) investigating 70 TB patients. The research reveals that the TB patients' obedience to take drugs is significantly influenced the presence of drug ingestion (PMO), with P=0.003, in which a TB patient

with active PMO has 16 times more obedient than those with inactive PMO. Similarly, the research by Sumarman and Bantas (2011) reveals that PMO's poor role is at risk of 3.013 times to make the patients disobey the recheck of phlegm in the final phase of treatment compared to patients who have a good role of PMO.

CONCLUSION

It can be concluded that supervisors' knowledge does not affect adherence, but their support significantly influences the patients' obedience of taking TB drugs.

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