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Research Article

Effectiveness of A-Ba-Te Innovation (Let's Eradicate Tuberculosis) on Self-Care Management among TB Patients in Public Health Center

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Abstract

Aims: This study examines the effectiveness of the A-Ba-Te innovation in promoting self-care among TB patients in the Sirampog Health Center service area.
Methods: A quasi-experimental design with one group was observed on the dependent variable after intervention (one group pretest-posttest design). The study involved 22 respondents who received treatment at the Sirampog Health Center over four weeks. They were given the "ABATE innovation," which included health education on TB disease, TB medication, self-care training, deep breathing exercises, effective coughing techniques, relaxation techniques, and semi-Fowler position management.
Results: Hypothesis testing used an independent T-Test with a significance level of 0.000, indicating a significant change in respondents before and after the treatment. The change was observed from a mean difference value of -35.818, indicating an increase of 35.818. Conclusion: This study concluded that the A-Ba-Te innovation is effective in improving Self-Care Management for TB Patients in the Sirampog Health Center service area.
Conclusions : The A-Ba-Te innovation, which includes health education, deep breathing exercises, effective coughing, semi-Fowler's position, and daily medication reminders via WhatsApp, has significantly improved self-care management in tuberculosis patients.

Keywords:
Health Center, Infectious Disease, Self-Care Management Tuberculosis,

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by the Mycobacterium tuberculosis bacteria. The World Health Organization (WHO) estimates that approximately two billion people worldwide are infected with latent TB, with an average of 9 million people developing TB each year as of 2015, and 1.8 million deaths from TB. In Indonesia, there were 724,309 TB cases in 2022, an increase of 280,674 cases from the previous year (Ministry of Health of the Republic of Indonesia, 2023). Each year, TB causes around 91,000 deaths, with an estimated incidence of 842,000 cases (1).Central Java Province is one of the provinces with the second-highest number of pulmonary tuberculosis cases in Indonesia. In 2022, the number of TB cases in Central Java reached 14,428 (187%) (Central Java Health Office, 2023). Data from the Health Office in Brebes Regency recorded 5,248 TB cases in 2022, with 4,861 people identified and treated, and 86 deaths. Meanwhile, feedback data on TB case detection from January to July 2023 shows that there were 208 suspected TB

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

cases in the Sirampog Health Center area, with 24 cases notified and 22 people receiving treatment.

Until now, one in three cases of tuberculosis (TB) remains undetected by the program. Riskesdas data indicates that the reasons for the failure of the TB treatment program are 16.54% of patients feeling that the TB treatment is too long, 37.51% of patients feeling that they are already healthy even though the treatment is not complete, and 28.42% of patients not regularly attending follow-up appointments (2). Non-compliance of TB patients with their treatment program is caused by factors such as negative stigma from society towards pulmonary tuberculosis, boredom with the prolonged treatment, side effects of medication, illness, the role of the medication supervisor (PMO), and the patients themselves (3). These factors result in a range of reactions in individuals who discover they have pulmonary tuberculosis, from shock and denial, feelings of sadness, self-blame, uncontrolled emotional outbursts, and eventually showing signs of decreased self-efficacy (4).

The impact of tuberculosis (TB) affects not only the physical but also the psychological aspects. Physical effects include general weakness, weight loss, night sweats without physical activity, and pallor, while psychological impacts can include emotional states such as boredom and frustration with lengthy treatments, lack of motivation, and severe depression (2). TB patients may also experience fear, shock, and disbelief upon learning about their health condition, shame due to suffering from a contagious disease, and fear of death (5). This situation can lead to a decrease in the patient's motivation for self-care. If the inability to care for oneself continues, it may result in problems with prevention, detection, and management of the illness (6).

Efforts to manage health and reduce the impact of TB, both physically and psychologically, are through self-care management. Self-care management is an activity carried out by individuals, families, or communities to achieve, maintain, and enhance optimal health (7). Nurses, as part of the healthcare workforce, play a crucial role in changing patient and family behaviors to achieve balance and independence in self-care activities. Dorothea E. Orem (1971), as cited in Kurniati and Effendi (2020), believes that everyone has the ability to meet their basic needs independently. The role of the nurse is to act as an agent who can assist clients in regaining their role as a self-care agency. Furthermore, nurses also play a role in increasing patient understanding (8).

Self-care management can be carried out through disease prevention and management. The implementation of self-care management can be achieved by changing lifestyle and engaging in positive behaviors. Patient involvement in TB treatment through self-reliance in self-care can lead to patient satisfaction because it allows them to actively participate in decision-making, engage in the healthcare system, avoid feelings of embarrassment and stress, and assist the government in addressing the shortage of healthcare professionals in the community (9).

Self-care behaviors and self-management performed by patients and their families during the treatment process are crucial for the cure and success of the complete treatment of pulmonary tuberculosis (TB) which lasts 6 to 9 months. One effort to improve self-care for TB patients is through health coaching provided by the Self-Help Group method. A Self-Help Group is a group or peer network where members share physical or emotional issues (10). Through Self-Help Groups, members can share experiences and information.

The A-Ba-Te (Ayo Basmi TB) innovation is a Self-Help Group-based innovation aimed at motivating TB patients to have Self-Care Management skills. Self-care behaviors and self-management performed by patients and their families during TB treatment are

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

key to curing and successfully completing the 6 to 9 months of pulmonary TB treatment. One effort to enhance self-care for TB patients is through health education provided via Self-Help Groups. The A-Ba-Te (Ayo Basmi TB) innovation involves forming Self-Help Groups, appointing a Medication Adherence Coordinator (leader), holding sharing sessions, and providing materials. The Coordinator/leader of the Medication Adherence Group is a coordinator for a small group who is responsible for monitoring and reminding members through WhatsApp/cell phone daily. With Self-Help Groups, each member develops high empathy for others, fostering mutual support to form adaptive coping. Therefore, the aim of this research is to assess the effectiveness of the A-Ba-Te (Ayo Basmi TB) innovation on self-care management for TB patients in the working area of the Sirampog Health Center.

METHODS

Study design and setting

This study uses a quasi-experimental research design, which is a type of experimental research conducted without strict randomization constraints. This type of research involves performing an intervention or action on one group and then observing the dependent variable after the intervention (one group pretest-posttest design). This study was conducted in January 2024 at Puskesmas Sirampog over a period of 4 weeks.

Sample

The sample in this study consisted of 22 TB patients treated at Puskesmas Sirampog, using purposive sampling. Inclusion Criteria: respondents aged 21-59 years, respondents receiving 6 months of treatment, respondents with TB who are still able to perform activities, no comorbid diseases, and in good general condition. Exclusion Criteria: respondents with mental disorders, respondents with cognitive limitations, respondents unable to read and write (illiterate).

Intervention protocol

Before the intervention, the researcher formed a Self Help Group. This group formation was closely monitored by the researcher. The group consisted of 22 respondents, all of whom received the intervention (one group) without a control group (due to the limited number of respondents). From this group, one leader was selected to act as the Coordinator of Independent Medication Supervision (PMO). After forming the Self Help Group, subsequent meetings began implementing the A-Ba-Te Innovation, including:

a. Week 1: Health education on Tuberculosis (TB), which includes explanations about the definition, causes, signs, and symptoms of pulmonary TB, management methods, complication prevention, and prevention of TB transmission.

b. Week 2: Health education on TB medication, which covers the introduction of TB drugs, their benefits, and the dangers of non-compliance with TB medication.

c. Week 3: Self-care education, focusing on teaching self-care skills such as deep breathing exercises and effective coughing techniques.

d. Week 4: Self-care education, focusing on teaching relaxation techniques and the semi-Fowler position adjustment.

Each meeting begins with a sharing session from each group member and is then followed by the presentation of material. Meetings are held once a week for four weeks. Each week, a different leader will be appointed/elected. The selection of the leader is done through group discussion without specific criteria. However, the researcher directs/recommends participants who are most active, have good communication skills, and show responsibility, as they will need to remind

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

fellow members. The leader's task is to remind group members to take their medication via WhatsApp by sending a short video of themselves taking the medication as a daily report in the group. The leader's role will last one week and will then be replaced by another member as the new leader. At the end of the meeting, a Self Care Management assessment will be conducted to determine the effectiveness of the activities carried out. The media used include PowerPoint slides and some videos (deep breathing exercises and effective coughing). Participants are also provided with a module containing material that can be read at home.

Instrument

The instrument used in this study was the self care management questionnaire. This questionnaire consists of 30 items and divided into 6 domains, namely compliance with taking medication, increasing nutritional intake, sleep patterns, preventing transmission, physical exercise, not smoking.

Data collection

The researchers collected data on self-care management from TB patients receiving treatment at Puskesmas Sirampog before the intervention and observed them again after the application of A-Ba-Te treatment. The instrument used was a Self-Care Management questionnaire consisting of 30 items. Additionally, the researcher provided an ABATE Module Book to respondents as a reference material.

Data analysis

The data collected were analyzed using univariate analysis to see the characteristics of respondents and bivariate analysis in the form of independent t-test to compare self care management data using SPSS.

RESULTS

Characteristics of Respondents

This study used 22 respondents, with the characteristics of the respondents observed based on age, gender, education, occupation, and their relationship with the patient. The frequency distribution of the respondents can be seen in the following table:

Table 1. Respondent Characteristics

No Characteristics	Frequency (F)	Percentage (%)
1. Gender		
Male	8	36.4
Female	14	63.6
2. Age		
20 - 29 years	5	22.7
30 - 39 years	11	50.0
40 - 49 years	4	18.2
50 - 59 years	2	9.1
3. Occupation		
Housewife	3	13,63
Private Sector	17	77,27
Laborer	2	9,09
Civil Servant	0	0
Retiree	0	0
4. Education		
Not yet elementary school	2	9.1
Completed elementary	5	22.7

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

school		
Junior high school or equivalent	10	45.5
Senior high school or equivalent	4	18.2
Higher education	1	4.5
5. Treatment duration		
1-4 months	12	54.5
5-9 months	5	22.7
10-14 months	4	18.2
15-19 months	1	4.5
6. Family History of Tuberculosis		
Exist	11	50.0
Not	11	50.0
7. Smoking History		
Yes	8	36.4
No	14	63.6

In this study, normality tests were conducted, and statistical testing was performed using the Independent Sample T-Test, which is a parametric test to determine the effectiveness or differences between pretest and posttest results of the independent variable on the dependent variable. In this study, the independent variable is innovation A-Ba-Te, and the dependent variable is Self-Care Management in TB patients. The following are the results of the Independent Sample T-Test using SPSS.

1. Normality Test
   The normality test is used to ensure that the data used is normally distributed.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
GROUP	Statistic	Df	Sig.	Statistic	df	Sig.
PRETEST	.181	22	.060	.939	22	.192
POSTTEST	.158	22	.163	.932	22	.133

Based on the data above, it is known that the significance value is above 0.05, so the data used is normally distributed.

2. Homogeneity Test
   The homogeneity test is a statistical procedure intended to show that two or more sample groups are drawn from populations with the same variance.

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

Test of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Based on Mean	2.375	1	42	.131
Based on Median	2.408	1	42	.128
Based on Median and with adjusted df	2.408	1	39.062	.129
Based on trimmed mean	2.346	1	42	.133

Based on the table above, the sig based on mean value is above 0.05, indicating that the data used is homogeneous.

3. Hypothesis Testing
In this study, hypothesis testing is conducted using an independent T-Test. This statistical test is used to determine whether there is a significant difference between two groups.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DATA	Equal variances assumed	2.375	.131	-21.162	42	.000	-35.818	1.693	-39.234	-32.402
	Equal variances not assumed			-21.162	41.003	.000	-35.818	1.693	-39.236	-32.400

DISCUSSION

Respondent Characteristics

Based on the research findings, it is known that the characteristics of respondents by age show that most respondents are adults, specifically between 30 and 39 years old. Adulthood is associated with a stage of achievement, which includes maximal influence, self-guidance, and self-assessment. Thus, at this age, patients have self-efficacy as described by Potter & Perry (2017)(11), which facilitates the assimilation of new health information and improves Self-Care Management among respondents. Increased age leads to greater maturity, allowing clients to think rationally about the benefits of adequate Self-Management in their daily lives (Sousa et al., 2005 in Suprajitno, 2014) (12).

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

The effect of A-Ba-Te intervention on improving self care management in TB patient

The result of this study indicate that Innovation A-Ba-Te is effective in improving self care management for TB Patients in the Working Area of Sirampog Health Center. This result is in line with Edberg (2010) who said that one way to create a good perception is through health education. This is because health education provides patients with accurate knowledge about their disease, thereby giving them a correct understanding of the potential difficulty in managing the disease (Magnitude), the extent of the problems faced (Generality), and helps patients understand the strengths (Strength) they have in dealing with issues in disease management. Ultimately, this builds the patient's self-management. This aligns with Falvo's research in Atak (2010) (13), which states that health education can enhance an individual's self-efficacy, which in turn affects self-care management. Treatment for TB patients involves using Anti-Tuberculosis Drugs (OAT) according to national guidelines, which include a 2-3 month phase or intensive phase and a 4-7 month phase or continuation phase. First-line treatment uses Rifampicin (R), isoniazid or INH (H), pyrazinamide (Z), streptomycin (S), and ethambutol (E) (2,14,15).

In addition to Health Education in this study, respondents were taught deep breathing exercises and effective coughing. Effective coughing aims to expel sputum safely and thoroughly, allowing patients to reduce the energy used for coughing, decrease fatigue due to shortness of breath and coughing. Coughing is a natural body behavior to protect the lungs when there are foreign objects in the airways (16). Research on the impact of effective coughing on sputum production in tuberculosis patients shows significant benefits, as effective coughing is highly effective for sputum expulsion, helps clear secretions from the airways, and can alleviate shortness of breath in pulmonary TB patients (17). The stages of effective coughing taught to respondents in this study are as follows: 1) Take a slow breath and end with a slow exhalation for 3-4 seconds. 2) Breathe diaphragmatically in a slow and comfortable manner, and avoid over-ventilating the lungs. 3) After taking a slow breath, hold it for 3 seconds to control the breath and prepare for an effective huff cough. 4) Tilt your chin slightly upwards and use abdominal muscles to perform three quick exhalations with the airway and mouth open, producing sounds like ha, ha, ha or huff, huff, huff. 5) Control your breath and then take two slow breaths. 6) Repeat the coughing technique until the mucus reaches the back of the throat; then cough and expel the mucus. The researcher chose effective coughing by considering the indications for effective coughing. To address ineffective airway clearance, effective coughing has been performed on patients. Indications for effective coughing include patients with respiratory disorders, patients unable to clear secretions, and patients with added sounds while breathing (16).

The research findings by Ningsih S. and Dwi Novitasari (2023) (18,19), indicate that providing nursing care for pulmonary TB patients with a self-intervention of effective coughing can improve oxygen saturation, reduce shortness of breath, and facilitate the expulsion of secretions (20). This can certainly help patients perform self-care at home, thereby enhancing patient self-care management.

1. Self-care involves teaching relaxation techniques and semi-Fowler position adjustment
   Meanwhile, positioning the patient in a semi-Fowler or high-Fowler position helps the patient to practice coughing effectively and take deep breaths, allowing the lungs to expand fully. The semi or high-Fowler position facilitates effective coughing, which eases the expectoration of mucus (21).

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

2. Remind to take medication via WhatsApp
   In addition to receiving health interventions and self-care at home, patients are also consistently reminded to take their medication by the leader. A study in China indicated that a daily SMS reminder system can significantly improve medication adherence among pulmonary tuberculosis patients (22). Additionally, research in Malaysia demonstrated that the average adherence to tuberculosis medication was significantly higher in the intervention group receiving SMS services compared to the control group after a 6-month study period (22).

   Meanwhile, research in Jember Regency, Indonesia also proves that the use of mobile phone reminder applications has a significant impact on adherence to tuberculosis (TB) treatment in the intervention group compared to the control group (23). With the advancement of modern technology, information, and communication, various technologies now facilitate and support people in their activities and interactions without needing face-to-face contact (24,25). In this study, the use of mobile phones serves as a measuring tool used as a medium between researchers and TB patients, functioning as a communication tool to remind patients to take their medication through the Short Message Service (SMS) feature available on various types of mobile phones. This is in line with research conducted by Ni Putu Ayu Sumertini in 2022 titled "The Impact of Short Message Service (SMS)-Based Health Education on Self-Care Management in Tuberculosis Patients in Klungkung Regency". Text messages sent via mobile phones make them important and potentially effective in changing behaviors, promoting health, and supporting the availability of healthcare services in a widespread, inexpensive, and rapid manner (26). The sending of reminder messages specifically for TB patients using mobile phones is said to be effective because, in addition to serving as a medication alarm, patients also feel cared for and build trust in healthcare providers and the health system in general (27,28).

In this study, the exclusion criteria for respondents include those who cannot read and write, as respondents will need to fill out questionnaires and communicate using WhatsApp features. SMS reminders have proven to be an effective intervention medium in health services for TB patients. The study by Ali Rahman et al. (2023) found several positive responses from patients, including feedback through SMS replies sent by patients to nurses. Therefore, using N-SMSI reminders for OAT medication in TB patients is considered effective for supporting the success of TB treatment and can be implemented by health services, including Puskesmas and hospitals (29). Thus, reminding respondents to take their medication via WhatsApp has proven effective in improving self-care management for TB patients, as patients can manage their own care by taking their medication after being motivated through WhatsApp.

CONCLUSION

The A-Ba-Te (Let's Eradicate Tuberculosis) innovation, through the health education program on tuberculosis disease and tuberculosis medication, deep breathing exercises and effective coughing, semi-Fowler's position, and daily medication reminders via WhatsApp, has proven effective in improving self-care management in patients with tuberculosis.

The research results, if further developed, could become a flagship program for community health centers as a form of support for individuals with tuberculosis. Future researchers could explore self-care management further by increasing family involvement to ensure stricter control, such as implementing a medication control card

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

that is filled out and signed by family members as caregivers.

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CONFLICTS OF INTEREST

The authors declared no conflict of interest.

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Jurnal Keperawatan Komprehensif
Volume 10 Issue 3 July 2024

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