Case study

Improving Health Literacy of TB Patients at Bandarharjo Health Center through TB Literacy Book Media (BuLit TB)

ABSTRACT.

Objective and Background: The Bandarharjo Health Center reported in 2019 that the number of cases of Multidrug-Resistant Tuberculosis had increased to four. The current program to increase patient TB literacy is only education delivered by TB officers, and no specific media is used to increase patient TB literacy. The purpose of this study was to create literacy media in the form of TB literacy books (BuLit TB) in order to improve the literacy of TB patients at the Bandarharjo Health Center. **Methods**: This study included 50 tuberculosis patients whose literacy levels were assessed both before and after the intervention media was administered. In this study, the information gain method is used to determine the level of importance of a variable based on its target value. In addition, non-parametric tests were used in this study to determine the effect of the intervention on respondents' TB knowledge and Health Literacy levels. **Result**: According to the findings of this study, testing using a weighting algorithm reveals that education and age variables are important on the level of TB knowledge, with weights of 0.221 and 0.155, respectively. Furthermore, the education and address variables have a weighted score of 0.205 and 0.198, respectively, on the respondent's health literacy level. Non-parametric statistical tests revealed that BuLit TB media was effective in increasing the literacy of TB patients at the Bandarharjo Health Center. **Conclusion:** The BuLit TB media can be used by Health Center officers to help TB patients with literacy and education.

Keywords: *The BuLit TB media, Health literacy, Community health center, Tuberculosis, Tuberculosis literacy level*

1. INTRODUCTION

Pulmonary tuberculosis (TB) is a disease that is still a concern for the Semarang city government. By 2030, Semarang City is expected to achieve the TB elimination target [1]. The screening rate for TB suspects over the last 5 years has increased from 70% in 2014 to 107.3% in 2018. Based on gender, TB patients are mostly male with a proportion of 54% of the total TB patients in the city of Semarang. When viewed from the age group, most of them are in the productive age between 15-64 years by 71%. The number of MDR TB (multidrug-resistant tuberculosis) each year has increased from 21 cases in 2014 to 71 cases in 2018, this is due to the low level of health literacy of TB patients on the importance of medication adherence. This can also be seen from the recovery rate of Semarang City for the past five years has never reached the national target where the average recovery rate is only 18.32% [2].

Based on the dissertation report proposed by Fitriyah [3] on health literacy in TB patients, it was found that the literacy level of TB patients in the Sumenep City in the moderate category tends to be lower. Usually, patient literacy related to new knowledge in the health sector such as how to take medication and

TB treatment is obtained after contact with health center officers and is supported by a positive attitude and willingness to change [4]. This indicates that there is a possible relationship between treatment success and the patient's TB literacy level during the treatment period [5] With good health literacy, it is possible to increase the healing potential and reduce the number of Multi Drug-Resistant Tuberculosis (MDR-TB). Health literacy according to Sorensen is a person's ability to find, process, and make decisions from information obtained with his health. The concept of health literacy is very important to improve public health. The high level of health literacy in individuals will make that person able to understand complex things related to health in modern society [6].

Tuberculosis is a chronic disease that requires long-term treatment, which is six months [7] The success of treatment depends on the level of individual literacy where the higher a person's TB literacy, the higher the level of treatment adherence and TB cure rates. Improving health literacy can be done in several ways, one of which is by utilizing the availability of information media about TB. According to Bergsma's research, media has a significant influence on public health. Media literacy has enormous potential as a strategy in preventing health-risk behaviors [8]. The research supports that the media is one of the interventions that can increase the literacy level of an individual in terms of health, hence it has an impact on increasing the health status of the community.

Bandarharjo Public Health Center is one of Semarang's health centers with the highest number of tuberculosis patients. According to the Bandarharjo Health Center report, the number of cases of Multi Drug-Resistant Tuberculosis (MDR-TB) increased in 2019 to four. There is no specific media used to improve patient TB literacy in the program that runs to increase patient TB literacy. It is only education delivered by TB officers. Based on this context, it is necessary to create literacy media in order to increase TB literacy among TB patients at the Bandarharjo Public Health Center. As a result, this study proposes the creation of a literacy book called BuLit TB and examines its effectiveness in increasing the health literacy of TB patients at Bandarharjo Health Center.

2. METHOD OF RESEARCH

This research is experimental-based research with a time-series design. In this study, measurements of respondents will be carried out twice at several different points (pre-test and post-test) after being given BuLit TB. The number of samples is 50 people with active TB who are registered at the Bandarharjo Health Center.[9]

Comment [AK1]: Has the study been done or will be done ?

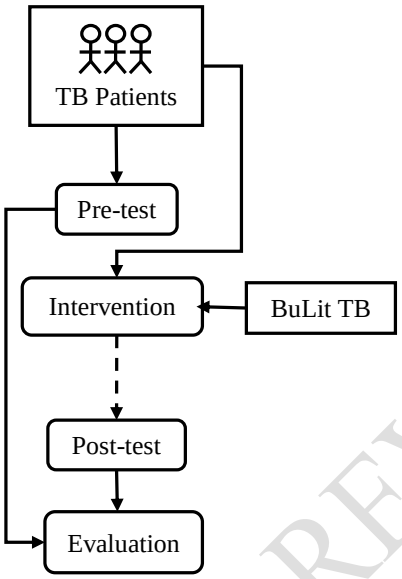

FIGURE 1. The proposed method of this research consists of two steps data collection (pre-test and post-test)

The research instrument used as the evaluation properties was constructed from HLS-EU-SQ10-IDN proposed by [10]. As shown in Fig 1, the first data collection process was carried out by assessing the patient's health literacy level using a prepared questionnaire. After the pre-test was conducted, the intervention using BuLit TB was begun. The patient will be given the BuLit TB media as their handbook for three weeks. After three weeks, the post-test was performed using the same questionnaire used in the pre-test. The purpose of the post-test was to evaluate the impact of BuLit TB intervention. [11]

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The data gathered from both assessments were then processed using a weighting algorithm called information gain (IG).[12] The information gain (IG) method was used to select which variable has high potential in defining the health literacy level of the patients. This method considers the information of the variable occurrence toward the target variable [13]. Moreover, to evaluate the significance of BuLit TB intervention among TB patients, this research proposed the use of the T-test method. [14]

3. RESULT AND DISCUSSION

The research of the effectiveness of BuLit TB as a health literacy media intervention in Bandarharjo Health Center has been conducted. The data collected from pre-test and post-test sessions were then analyzed to gain the patient's information such as demography and health literacy level before and after BuLit TB was given.

Patients Demography

The population of this research consists of 50 TB patients registered in Bandarharjo Health Center, Semarang. The demography variable assessed was patient profession, education degree, and residential address as shown below:

TABLE 1. The TB Patients Demography Profiles.

No.	Respondents Profiles	Total	Percentages
1.	**Profession**		
	Private sector employee	15	30,0 %
	Does not work	22	44,0%
	Housewife	12	24,0%
	Pensionary	1	2,0%
2.	**Education**		
	No School	4	8,0%
	Elementary School	14	28,0%
	Junior High School	10	20,0%
	Senior High School	21	42,0%
	Bachelor	1	2,0%
3.	**Residential Address**		
	Tanjungmas	21	42,0%
	Bandarharjo	12	24,0%
	Kuningan	11	22,0%
	Dadapsari	6	12,0%

From data displayed in Table 1, it can be seen that from 50 respondents there are 44% of respondents do not work or are at home, this is because most TB patients are people whose have average age is above 43 years. In addition, most of the respondents have a high school education level. Then, based on the Residential Address, mostly the respondents live in Tanjungmas.

Health Literacy Level

Due to the result of the pre-test and post-test conducted at two different points of time, it can be analyzed the result of each test session is shown below. [15]

TABLE 2. The patients TB literacy level was gathered from the pre-test session.

TB Literacy Level	Number of Respondents	Percentages
Inadequate	0	0 %
Problematic	12	24 %
Sufficient	27	54 %
Excellent	11	22 %

From Table 2 can be seen that 54% of respondents have the Sufficient level of TB literacy which denoted that most of the respondents have enough knowledge in handling TB. Meanwhile, the Problematic level has achieved by 12 respondents where the amount was greater than the Excellent level with 11 respondents.

The post-test was performed after the BuLit TB was assigned to the respondent as the intervention media, where the result can be seen below:

TABLE 3. The patients TB literacy level was gathered from the post-test session.

TB Literacy Level	Number of Respondents	Percentages
Inadequate	0	0 %
Problematic	8	16 %
Sufficient	25	50 %

Excellent	17	34 %

After the BuLit TB was given to the respondents, there is an increment of respondent number in several TB literacy levels as shown in Table 3. The Excellent level was increased by 54.54% compared to the pre-test result. While the Problematic level was decreased by 27.8% which means the BuLit TB was capable of increasing the TB literacy of the TB patients.

TABLE 4. The patient health literacy level was gathered from the pre-test session.

TB Literacy Level	Number of Respondents	Percentages
Inadequate	6	12 %
Problematic	20	40 %
Sufficient	5	10 %
Excellent	19	38 %

Furthermore, the analysis from pre-test data results using general health literacy level as displayed in Table 4 shows that 40% of respondent tends to be in Problematic level of Health Literacy. In addition, 6 respondents categorize into Inadequate levels. However, compared to the Problematic level, the number of respondents classified into Excellent level has slightly different percentages precisely 38%.

TABLE 5. The patient Health literacy level was gathered from the post-test session.

TB Literacy Level	Number of Respondents	Percentages
Inadequate	5	10 %
Problematic	16	32 %
Sufficient	9	18 %
Excellent	20	40 %

Moreover, after the intervention of BuLit TB was given, there are some changes regarding the total respondents in several levels of health literacy. Table 5 shows the Excellent level has increased by 40% compared to the result before the intervention. Fortunately, the Sufficient level also increases to 18%. On the other hand, both Inadequate and Problematic levels of Health Literacy was decreased to 10% and 32% respectively.

TABLE 6. The Information Gain Weight of Patients Demography based on TB Literacy Level

Patients Demography	IG weight
Profession	0,080
Residential Address	0,087
Ages	0,155
Education	0,221

The evaluation using the IG weighting algorithm was performed to identify which variable has an important level in determining the health literacy level. From the weighting result in Table 6, it can be seen that Education and Ages have higher weights compared to the Profession and Residential Address with 0.221 and 0.155 respectively. These weights denoted that both the Education and Ages have a potential impact on the TB Literacy Level of the respondents.

TABLE 7. The Information Gain Weight of Patients Demography based on Health Literacy Level

Patients Demography	IG weight
Profession	0,114
Residential Address	0,198

Ages	0,080
Education	0,205

Meanwhile, the Information Gain weighting result for the overall Health Literacy Level can be seen in Table 7. The result shows that the Education and Residential Address has a bigger impact in determining the Health Literacy Level of the respondent with both weights 0.205 and 0.198 respectively. Moreover, to identify the effectiveness of BuLit TB, this research conducts a T-test evaluation. This testing method was used to confirm the effectiveness of the media intervention based on pre-test and post-test results.

TABLE 8. The Effect of BuLit TB on Increasing Health Literacy Level of TB Patients at Bandarharjo Health Center

BuLit TB Intervention	Mean	SD	P-Value
Before the intervention	98.80	5.330	0.009
After the intervention	123.52	9.652	

Base on Table 8, it can be seen that the intervention of BuLit TB can increase the health literacy level of the TB patient by 25%. The result of the T-test shown p-value = 0.009 which denoted in statistic perception that there is differentiation in the health literacy level of patients significantly after the BuLit TB was given.

4. CONCLUSION

According to the findings of this study, testing with the Information Gain method reveals that the variables of education and age are critical to the level of TB knowledge, with weights of 0.221 and 0.155, respectively. Furthermore, the education and address variables have a weighted score of 0.205 and 0.198, respectively, on the respondent's health literacy level. Non-parametric statistical tests revealed that the TB BuLit media was effective in increasing the literacy of TB patients at the Bandarharjo Health Center. As a result, Public health center staff can use the TB BuLit media to support TB patients' literacy and education.

CONSENT

The study was carried out in accordance with research standards in the Republic of Indonesia, and written consent was obtained and kept by the author.

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