

NEEDS ANALYSIS IN DEVELOPING A MODEL OF A HEALTHY ENVIRONMENT IN PREVENTING THE RISK OF TUBERCULOSIS (TB)

Linda Marni*, Bustari Muchtar, Siti Fatimah

Doctoral Program of Environmental Sciences, Universitas Negeri Padang – Indonesia

*lindamarni@fik.unp.ac.id

ABSTRACT

Research has been carried out on a healthy environmental model in preventing the risk of Tuberculosis (TB). This study is to analyze the needs of the community in preventing the risk of TB. The method used is (R & D) with the ADDIE model. The research population is in RSUD Sungai Limau Sub-district with a total of 146 respondents. The sample used by all respondents in the research location is 146 respondents. Data collection using a questionnaire was distributed to respondents, then processed using the SPSS program. The results of the study found that with a value of 0.000, smaller than 0.05, there was a significant difference between knowledge, perception, and behavior in the Sungai Limau Sub-district to prevent the risk of TB disease. Therefore, it is necessary to create a healthy environmental model, especially for slum areas in Sungai Limau District.

Keywords: Preventing the Risk, Tuberculosis (TB), Healthy Environment, Padang Pariaman.

INTRODUCTION

Padang Pariaman Regency is one of the districts with the second highest TB incidence in West Sumatra Province. In 2015 Padang Pariaman Regency had 1,125 cases of new cases of acid-fast bacteria with suspected TB or known BTA (+) with a prevalence of 0.18%. In 2016, there were 1,244 new cases of AFB (+) with a prevalence of 0.17%. Furthermore, data from the Padang Pariaman District Health Office revealed that in 2018 from 6,894 the number of suspects examined, there were 368 estimates of pulmonary TB patients. In addition, Padang Pariaman Regency also has a Case Detection Rate (CDR) of only 40%, even though the target is 70%, with a program success of 84% (target 90%)¹. The high number of TB cases in Indonesia, especially in Padang Pariaman Regency, West Sumatra Province, has prompted the government to take immediate action or efforts to suppress TB cases.

These efforts can be seen from the policies issued through the Minister of Health Regulation No. 67/2016 concerning TB control which is carried out through health promotion, TB surveillance, risk factor control, discovery and control of TB cases, provision of immunity, and provision of preventive drugs. This policy is implemented by the government through free treatment for 6 months for pulmonary TB patients, monitoring programs for taking medication for TB patients to motivate patients to take medication regularly until completion of treatment, re-examine sputum at the appointed time, counseling the patient's family², and the implementation of the WHO-recommended Directly Observed Treatment Shortcourse chemotherapy (DOTS) strategy. However, various efforts made by the government have not shown maximum results. This could be due to the lack of optimal implementation of the DOTS strategy in government and private

hospitals, limited funds, lack of cross-program and cross-sectoral collaboration at the Health Office, and guidance for the private health sector not being carried out³.

Based on the results of research observations, if you look at the environmental conditions in Padang Pariaman Regency, most of the population relies on marine products for a living, and it is not surprising that many fishermen are classified as poor and need the intervention of various parties to increase their welfare. This can be seen from the presence of 230 uninhabitable houses in Padang Pariaman Regency that received housing assistance through the Self-Help Housing Stimulant Assistance Program (BSPS) from the Ministry of Public Works and Public Housing (PUPR)⁴. This condition indicates that the slums or houses are unfit for habitation with characteristics, among others, very high building density in a limited area, prone to social and environmental diseases, very low quality of buildings, inadequate environmental infrastructure is not served and endangers the sustainability of life. and livelihoods of its residents are still high⁵ in Padang Pariaman Regency. Whereas slum settlements are areas with the presence of risk factors and a potential for the spread of TB⁵.

Environmental conditions in Padang Pariaman Regency can be a risk factor for increasing TB disease, including low economic status increasing exposure to risk factors, and susceptibility to infectious diseases. Environmental risk factors are modifiable factors or factors that can be changed through the individual's awareness and social intervention while age, gender, and genetics cannot be modified⁷. The environmental risk factors based on division⁸ are risk factors for infection with TB as well as exogenous factors⁹ that are at risk for TB. The home environment is one of the risk factors for TB.

Home environmental factors that are part of the physical environment, such as poor ventilation can affect the temperature and humidity of the house due to the lack of light entering the house¹⁰. This condition can create a humid and dark home atmosphere, so germs can last a long time in the house¹¹, so they have a risk of transmitting to other individuals. Then the location of the house in a dense area¹² can accelerate TB transmission. Therefore, it is necessary to analyze the need for a healthy environmental model for people who live in slums to avoid infectious diseases such as TB.

METHODS

This research is a research and development (R & D) research that aims to see how far the effectiveness of developing an outcome (product)^{13 14 15 16 17 18}. The ADDIE model in this study was carried out on a needs analysis in the development of a healthy environment model to prevent the risk of tuberculosis in slum settlements in Sungai Limau Sub-district, Pariaman Padang Regency. The population of this research was conducted in RSUD Sungai Limau Sub-district with a total of 146 respondents. The sample in this study was all respondents in the research location, namely 146 respondents. Data collection using a questionnaire was distributed to respondents, then processed using the SPSS program.

RESULT AND DISCUSSIONS

This needs analysis aims to determine the initial conditions of the condition of patient's house and the neighbors around it. The needs analysis was carried out using a research instrument in the form of a question questionnaire to know the knowledge of families who were around TB patients and use the results of observations made on the condition of the home environment

around TB patients. Based on the results of initial observations, Sungai Limau Sub-district tends to be caused by a high density of house occupants, problems with toilets/latrines, lack of lighting, and high humidity. Furthermore, the results of the questionnaire containing knowledge questions about TB before being distributed to research respondents were tested for validity and reliability first. The results of the validity test showed that all question items on knowledge were valid as measured by the $R_{\text{count}} > R_{\text{table}}$ value (0.2303). Furthermore, the results of the reliability test (Table 1) can be seen that Cronbach's Alpha value has high reliability.

Table 1. Reliability test results of research instruments

Variable	r Alpha	Information
TB knowledge	0.845	High reliability
Perception	0.860	High reliability
Behavior	0.860	High reliability

Source: Processed results of primary data (2022).

A. Model implementation

The model that has been validated is applied to the working area of the health center that has the most TB data spread in Sungai Limau Sub-district, Padang Pariaman Regency with the following details:

1. TB knowledge

Descriptive analysis

Table 2. Descriptives

	N	Mean	Std. Deviation	Minimum	Maximum
Pre_test	73	3,26	3,362	0	13
Post_test	73	6,6	3,108	2	15
Total	146	4,93	3,636	0	15

Based on Table 2 above, it is known that the number of samples each is 73 respondents. The minimum value of the knowledge Pre_test is 0 and the maximum is 13, while the average is 3.26 with a standard deviation of 3.362. The minimum value of the Knowledge Post-test is 2 and the maximum is 15. While the average is 6.60 with a standard deviation of 3.108.

Normality test

Table 3. Tests of normality (a. Lilliefors Significance Correction)

Knowledge	Pre_test	Kolmogorov-Smirnov ^a		
		Statistic	df	Sig.
Knowledge	Pre_test	,174	73	,000
	Post_test	,120	73	,011

Homogeneity Test

Table 4. Test of homogeneity of variances (*Knowledge*)

Levene Statistic	df1	df2	Sig.
,776	1	144	,380

Homogeneity test shows that the significance value of Levene's statistics is greater than 0.05, which is 0.380, so it can be concluded that the experimental group and the control group have

the same variance (homogeneous).

Table 5. Differential test (Mann Whitney) (Ranks)

	Knowledge	N	Mean Rank	Sum of Ranks
Knowledge	Pre_test	73	53,44	3901,00
	Post_test	73	93,56	6830,00
	Total		146	

Based on the Ranks table above, it can be seen that the highest mean rank of knowledge is on the Post_test, which is 93.56. And the lowest mean rank is in the pre test, which is 53.44. Then proceed with the Mann Whitney test which can be seen in the following Table 6 below.

Table 6. Test statistics^a (a. Grouping Variable: Knowledge)

	Knowledge
Mann-Whitney U	1200,000
Wilcoxon W	3901,000
Z	-5,764
Asymp. Sig. (2-tailed)	,000

Based on the test statistics table above, it can be seen that the Asymp value. The significance of Knowledge is 0.000, smaller than 0.05, which means that there is a significant difference between the two tests consisting of Pre_test and post-test on TB Knowledge in Sungai Limau.

2. Perception

Descriptive Analysis

Table 7. Descriptive statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Pre_Perception_SL	73	44,34	5,197	36	63
Post_Perception_SL	73	47,08	5,309	38	65

Based on the Table 7 above, it is known that the number of samples each is 73 respondents. The minimum value of the perception Pre_test is 36 and the maximum is 63 while the average is 44.34 with a standard deviation of 5.197. The minimum value of the post-test perception is 38 and the maximum is 65. While the average is 47.08 with a standard deviation of 5.

Normality test

Table 8. Tests of normality (a. Lilliefors Significance Correction)

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre_Perception_SL	,180	50	,000	,888	50	,000
Post_Perception_SL	,188	50	,000	,901	50	,001
Pre_Behavior_SL	,433	50	,000	,629	50	,000
Post_Behavior_SL	,228	50	,000	,875	50	,000
Pre_Perception_LA	,299	50	,000	,858	50	,000
Post_Perception_LA	,222	50	,000	,891	50	,000
Pre_Behavior_LA	,443	50	,000	,469	50	,000

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Post_Behavior_LA	,328	50	,000	,780	50	,000
Pre_Perception_PK	,144	50	,011	,950	50	,034
Post_Perception_PK	,144	50	,011	,950	50	,034
Pre_Behavior_PK	,500	50	,000	,330	50	,000
Post_Perikku_PK	,327	50	,000	,617	50	,000
Pre_Perception_UL	,307	50	,000	,632	50	,000
Post_Perception_UL	,232	50	,000	,722	50	,000
Pre_Behavior_UL	,524	50	,000	,172	50	,000
Post_Behavior_UL	,335	50	,000	,692	50	,000

Based on the normality test Table 8 above, it is known that the significance value of the Pre_test and Post_test is small from alpha 0.05 so it can be concluded that the data is not normally distributed, so a non-parametric test using Man Whitney was carried out.

Homogeneity test

Table 9. Test of homogeneity of variances (Perception_SL)

Levene Statistic	df1	df2	Sig.
,105	1	144	,747

Homogeneity test shows the significance value of Levene's statistics is greater than 0.05, namely 0.747 so it can be concluded that the experimental group and the control group have the same variance (homogeneous).

Table 10. Differential Test (Mann Whitney) (Ranks)

Prepost_Perception_SL	N	Mean Rank	Sum of Ranks
Pre_test	73	60,58	4422,00
Perception_SL Post_test	73	86,42	6309,00
Total		146	

Based on the Ranks Table 10 above, it can be seen that the highest mean rank of Perception is on the Post_test, which is 86.42. And the lowest mean rank is in the pre test, which is 60.58. Then proceed with the Mann Whitney test which can be seen in the following Table 11 below.

Table 11. Test Statistics^a (a. Grouping Variable: Prepost_Perception_SL)

	Perception_SL
Mann-Whitney U	1721,000
Wilcoxon W	4422,000
Z	-3,706
Asymp. Sig. (2-tailed)	,000

Based on the test statistics table above, it can be seen that the Asymp value. The significance of the perception is 0.000, which is smaller than 0.05, which means that there is a significant difference between the two tests consisting of a Pre_test and a post-test on the community's perception of TB disease in Sungai Limau.

3. Behavior

Descriptive analysis

Table 12. Descriptives (Behavior_SL)

	N	Mean	Std. Deviation	Minimum	Maximum
Pre_test	73	18,79	,623	17	21
Post_test	73	20,99	1,047	19	24
Total	146	19,89	1,395	17	24

Based on the Table 12 above, it is known that the number of samples each is 73 respondents. The minimum value of the behavioral Pre_test is 17 and the maximum is 21. While the average is 18.79 with a standard deviation of 0.623. The minimum score for the behavioral post test is 19 and the maximum is 24. While the average is 20.99 with a standard deviation of 1.047.

Normality test

Table 13. Tests of normality (a. Lilliefors Significance Correction)

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre_Perception_SL	,180	50	,000	,888	50	,000
Post_Perception_SL	,188	50	,000	,901	50	,001
Pre_Behavior_SL	,433	50	,000	,629	50	,000
Post_Behavior_SL	,228	50	,000	,875	50	,000
Pre_Perception_LA	,299	50	,000	,858	50	,000
Post_Perception_LA	,222	50	,000	,891	50	,000
Pre_Behavior_LA	,443	50	,000	,469	50	,000
Post_Behavior_LA	,328	50	,000	,780	50	,000
Pre_Perception_PK	,144	50	,011	,950	50	,034
Post_Perception_PK	,144	50	,011	,950	50	,034
Pre_Behavior_PK	,500	50	,000	,330	50	,000
Post_Perception_PKku_PK	,327	50	,000	,617	50	,000
Pre_Perception_UL	,307	50	,000	,632	50	,000
Post_Perception_UL	,232	50	,000	,722	50	,000
Pre_Behavior_UL	,524	50	,000	,172	50	,000
Post_Behavior_UL	,335	50	,000	,692	50	,000

Based on the normality test Table 13 above, it is known that the significance value of the Pre_test and Post_test is small from alpha 0.05, so it can be concluded that the data is not normally distributed, so a non-parametric test using Man Whitney was carried out.

Homogeneity test

Table 14. Test of Homogeneity of Variances (Behavior_SL)

Levene Statistic	df1	df2	Sig.
11,844	1	144	,076

Homogeneity test shows the significance value of Levene's statistics is greater than 0.05, namely 0.076 so it can be concluded that the experimental group and the control group have the

same variance (homogeneous).

Table 15. Differential Test (Mann Whitney) (Ranks)

	Prepost_Behavior_S L	N	Mean Rank	Sum of Ranks
Behavior_SL	Pre_test	73	39,95	2916,00
	Post_test	73	107,05	7815,00
	Total			146

Based on the Ranks Table 16 above, it can be seen that the highest mean rank of Behavior is on the Post_test, which is 107.05. And the lowest mean rank is in the pre test, which is 39.95. Then proceed with the Mann Whitney test which can be seen in the following Table 16 below.

Table 16. Test Statistics^a (a. Grouping Variable: Prepost_Behavior_SL)

	Behavior_SL
Mann-Whitney U	215,000
Wilcoxon W	2916,000
Z	-9,901
Asymp. Sig. (2-tailed)	,000

Based on the test statistics Table 17 above, it can be seen that the Asymp value. Perception significance is 0.000, smaller than 0.05, which means that there is a significant difference between the two tests consisting of Pre_test and post-test on community behavior on TB disease in Sungai Limau.

B. Discussion

From the results of the needs analysis, it is known that statistically TB knowledge, TB perception, and community habits in maintaining a healthy environment are very low. However, if seen from the results of observations, Sungai Limau Sub-district tends to be caused by a high density of house occupants, problems with toilets, lack of lighting, and high humidity.

Changes in a person's behavior cannot be done quickly unless given special treatment. Therefore, the main factor that must be done first is to increase public knowledge. With sufficient knowledge, someone will try to have a clean and healthy lifestyle¹⁹.

With sufficient knowledge about Tb, the respondents also have different perceptions about Tb. ²⁰states that the higher the perception of tuberculosis sufferers about the spread and consequences of not taking treatment, the more behavior they will have to avoid bad things happening. Increased perception also encourages a person to begin to feel the importance of getting information, and the need for support as an impetus to do better activities.

In this study, knowledge, and perceptions were increased by providing education in the form of counseling and picture sticker paper to respondents. Education is an effort to persuade the public to take action to maintain and improve health, of the 291 respondents in four sub-districts, in the implementation of behavior change, 100% of them decided to change their behavior and habits. This is because they do not want their family members to get TB disease. Statistically, the results of the application of the healthy environment model were also effective and practical as seen from the significantly increased Pre_test and Post_test results.

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