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Enhancing Maternal Knowledge About Tuberculosis in Toddlers Through Booklet Based Health Education in Surabaya

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ABSTRACT Tuberculosis is an infectious disease that significantly contributes to increased illness, mortality, and disability rates among children, particularly toddlers. Mothers play a crucial role in preventing this disease in toddlers, highlighting the necessity of maternal knowledge to prevent tuberculosis transmission effectively. This study aims to assess the impact of health education using a booklet on tuberculosis in toddlers on mothers' knowledge in the East Perak area of Surabaya's Community Health Center. Employing a *Quasi-Experimental* method with a *One Group Pre-Post Test* Design approach, the research targeted mothers of toddlers in RW 04 of East Perak Village and RW 05 of Bongkaran Village, totaling 68 participants. Initially, 40 mothers demonstrated sufficient knowledge, prompting targeted health education efforts to enhance their understanding. *The Wilcoxon Sign Rank Test* yielded a p-*value of 0.000 ($p < \alpha = 0.05$)*, indicating statistically significant findings. These results underscore the booklet's efficacy in improving mothers' knowledge about tuberculosis in toddlers, owing to its effective and accessible educational format. This medium holds promise for future research endeavors.

INDEX TERMS Tuberculosis, toddler, level of knowledge, health education, booklet.

I. INTRODUCTION

In the world, tuberculosis ranks second in terms of infectious diseases (after COVID-19, which is higher than HIV/AIDS) and is the 13th biggest cause of death. Children, especially toddlers, have a high risk of contracting a disease, especially toddlers who live in the same house with tuberculosis sufferers. A weakened immune system can be one of the causes of the transmission of Tuberculosis in children [1] [2][3].

According to WHO 2020, an estimated 1.1 million children in the world suffer from Tuberculosis. In 2019, the Indonesian Ministry of Health stated that 7,950 cases of children were found in Indonesia[4]. In Surabaya, Tuberculosis In children, 801 cases were found [5]. In this case, parents play a crucial role in their children's health. Particularly in young children who still rely entirely on their mothers [6][7]. Besides immunity and the surrounding environment, knowledge can also influence the transmission of TB. Therefore, mothers need to have good knowledge so that they can prevent transmission and manage TB disease in children. In some cases of TB found in children, transmission occurs due to parents' lack of awareness, leading to bacterial transmission to children who have household contact with adult TB patients. So mothers must have enough knowledge to avoid transmission and overcome TB in children[8][9][10].

The government organizes programs called TOSS (Find a Cure Until Cured), which is a movement that invites the public to understand TB disease and its mitigation so that it is expected to be able to form a community that cares about TB [11][12]. Another effort that can be made to support government programs is the provision of health education. In this study, health education will be given to mothers about TB disease in toddlers, this is because mothers are the closest people to children[13][14][15]. So that TB prevention can be done in children, especially toddlers. This study will be conducted to measure and increase maternal knowledge about TB in toddlers. This health education will be carried out using the media booklet [16][17][18][19].

II. METHOD

Research Ini is quantitative research. The types of research are: *Correlation Analytics* with design *Quasy Experimental* use Approach *One Group Pre-Post Test Design*. The purpose

of this study is to examine how health education booklets affect mothers' awareness of tuberculosis in young children [20]. The study population consists of mothers residing within the operational area of the East Perak Surabaya Health Center. There were 73 moms in the study's population.

Based on the sample size calculation using the Slovin's formula, a total of 68 mothers with toddlers were included in the study. The study's sample consists of a subset of the general public that satisfies the inclusion requirements, which are as follows: mothers with toddler-aged children living in the East Perak Health Center's working area who are willing to participate in the study as research subjects and who possess reading and writing skills [21]. *Simple Random Sampling* is a sampling technique Sampling of a population is done randomly without regard to the strata present in that population[22].

The data collection of this research was carried out in the Puskesmas Perak Timur Surabaya area, precisely in Perak Timur and Bongkaran Village in February 2024. Data collection was carried out after the publication of ethical standards for the health polytechnic ethics committee of the Surabaya Ministry of Health. The research instrument used in this study is a questionnaire. This knowledge level questionnaire aims to assess the extent of the influence of mothers' knowledge on the prevention of TB in toddlers. There are 20 questions designed to evaluate knowledge levels regarding injury prevention using the Guttman scale. The scale used in this research provides clear-cut answers (true or false).

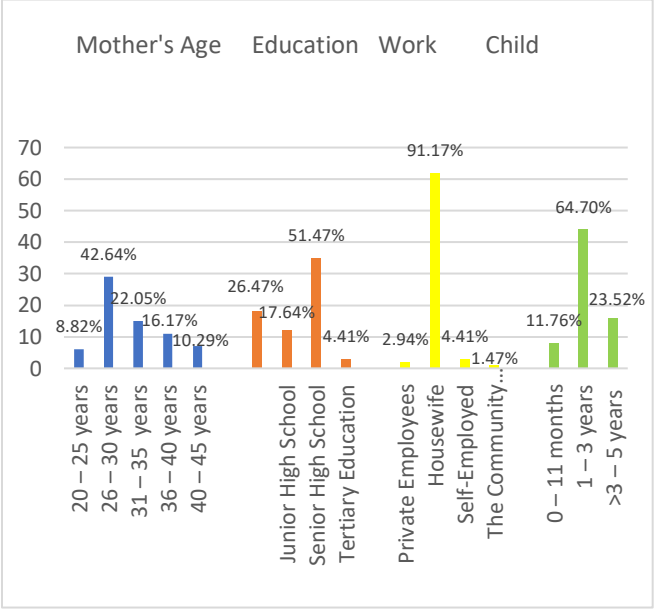
With an alpha level of 0.05 indicating a 95% confidence level, the critical r table value was determined to be 0.4438 for a two-tailed test. After conducting the validity test, it was found that the calculated r value was greater than the critical r table value (0.4438), indicating that the questionnaire items developed by the researcher were valid. Subsequently, reliability testing yielded an alpha value of 0.930, which falls within the range of 0.70 to 0.90. This indicates the high reliability of the questionnaire. In conclusion, based on the results of validity and reliability testing, the questionnaire is deemed suitable to be used as an instrument in this study.

In data analysis, we begin with testing the normality of the data to determine whether it follows a normal distribution or not. The normality test used in this study is the Liliefors Significance Correction test, comparing the values from Kolmogorov-Smirnov and Shapiro-Wilk tests. This choice is based on having a sample size of more than 50 but less than 100 respondents in the research. If the data is normally distributed and the data is paired, then the analysis test used is a parametric test using a *Paired T-test*. But if the data is abnormally distributed and paired, then use the *Wilcoxon Sign Rank Test*. [23][24].

III. RESULT

The East Perak Health Center's working area, situated on Jl. Perak Bar. No. 29 in West Perak, Krembangan District, Surabaya, East Java 60177, was the site of this study. This Puskesmas has a working area consisting of 5 villages in Pabean Cantikan District. Covering Nyamplungan, Bongkaran, North Krembangan, East Perak, and North Perak Villages. Data collection will be carried out on February 12 – 23, 2024. Researchers conducted home visits and conducted pre-tests then continued to provide health education media booklets. Respondents are given 1x24 hours to study the booklet, and then the next day the researcher will conduct a post-test. The complete result data is presented in the following description.

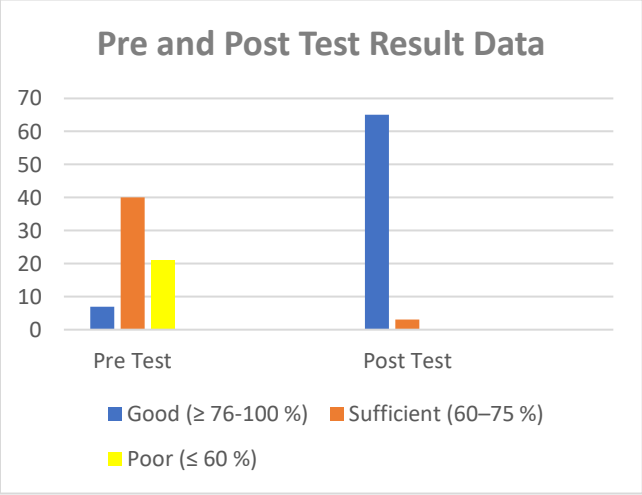
FIGURE 1
General sample characteristics



Based on Figure 1. The age data of mothers is almost half in the age range of 26 – 30 years, the last education of mothers is mostly in the range of high school, the work of mothers who have toddler- age children in the region, almost entirely as housewives, then the age of toddlers is mostly in the age range of 1 – 3 years.

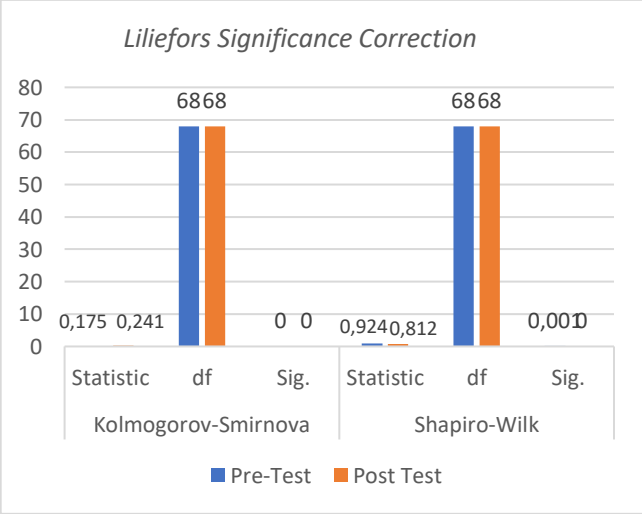
FIGURE 2

Pre-Test and Post-Test Results Data



Based on Figure 2. Before receiving health education through a booklet about Tuberculosis in toddlers, the majority, 58.82% of mothers, had sufficient knowledge. After receiving health education, there was a significant increase, with almost all (95.58%) mothers who have toddlers in RW 04 and 05 gaining good knowledge about Tuberculosis in toddlers.[25][26].

FIGURE 3
Findings from the Normalcy Test Data of Mothers with Toddler-Aged Children in the Perak Timur Surabaya Health Center's Working Area



The Liliefors Significance Correction Normality Test for the pretest and post-test variables is 0.000 – 0.001, as shown in Figure 3. Given that the significant value is less than 0.05, it can be concluded that the pretest and post-test data are not normally distributed. Therefore, when working with data that is not normally distributed, a non-parametric test known as the Wilcoxon Sign Rank Test is utilized for hypothesis testing.

TABLE 1

Uji Wilcoxon Sign Rank Test

Ranks				
		N	Mean Rank	Sum Of Ranks
Post-Test – Pre-Test	Negative Ranks	0a	.00	.00
	Positive Ranks	68b	34.50	2346.00
	Ties	0c		
	Total	68		

Test Statistics

	Post-Test - Pre-Test
With	- 7.189b
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

The Wilcoxon Sign Rank Test results are displayed in TABLE 1, where the post-test and significant (2-tailed) pretest values are 0.000. Since the significance value is less than 0.05, it is possible to conclude that H0 is rejected and H1 is accepted. Based on these findings, the Perak Timur Surabaya Health Center's working area can benefit from health education media booklets regarding tuberculosis in toddlers.

IV. DISCUSSION

This research was conducted in 2 RW in different sub-districts, namely Kelurahan Perak Timur and Kelurahan Bongkaran. The very dense environment in the two RWs is one of the reasons for the high cases of tuberculosis transmission in the area. The location of the area can also affect the level of knowledge of the community, one of the RW is located very far from the center of public health services so residents in the area are less exposed to education, thus making people underestimate and think that this tuberculosis disease is not dangerous. Some adults and toddlers who live close to tuberculosis sufferers and have symptoms that match the symptoms of TB do not carry out health checks at the Puskesmas and consider the symptoms that arise to be ordinary diseases. Lack of health education from medical personnel can cause public trust related to health to decrease.

In line with this research, TB disease can be transmitted to anyone especially toddlers who have a high risk of contracting a disease, especially toddlers who live in the same house with TB sufferers. A weak immune system can be one of the causes of TB transmission in children [1][27][28]. In addition to immunity, knowledge can also affect TB transmission [29]. In addition to having a significant impact on an individual's and a community's health, knowledge, and attitude factors are crucial in determining the effectiveness of disease control initiatives and the prevention of disease transmission, including tuberculosis. [30][31][32]. The government even organizes programs TOSS is a movement that invites the public to

understand correctly about TB disease and its mitigation, so that it is expected to be able to form a community that cares about TB [11][33].

Mothers who have toddler-age children in RW 04 Perak Timur sub-district and RW 05 Bongkaran sub-district mostly have sufficient knowledge and a small number have good knowledge, this is because some mothers with good knowledge have a role in the community such as cadres who have received health information in the form of health counseling during screening so that health workers and cadres can work well together. Some mothers with good knowledge, are also very diligent in seeking information about health through social media. Health information is not provided directly by medical personnel but through health cadres. Limited information is one of the factors that affect the knowledge of mothers in RW 04 of Perak Timur sub-district and RW 05 of Bongkaran sub-district, In order to prevent the spread of tuberculosis in toddlers, mothers must receive health education regarding the disease in order to raise awareness and the level of knowledge among mothers who have children under the age of five. This can be an effort to reduce morbidity, disability, and death rates in toddlers[34][35].

Data after providing health education about Tuberculosis in Toddlers using *booklet media* was obtained almost entirely 95.58% as many as 65 mothers have good knowledge, and it is still found that there are still 3 mothers who have sufficient knowledge, this can also be influenced by education where the three mothers have the last elementary education. People with the last elementary school education only can read and write, equipped with the basics of mathematics, Indonesian, basic knowledge of morals, national and state life, and history. That is, for someone who has the last elementary school education, the scientific aspect and the provision of knowledge are still at the level of introduction. Therefore, mothers who have the last elementary school education must think harder to understand and accept other knowledge of a higher level.

In addition, work can also affect the level of knowledge. Mothers who have very dense activities at work can cause mothers to get tired easily, reducing their concentration in reading and studying the *booklet.* In this post-test result, 2 out of 3 respondents do not work or as housewives, and 1 out of 3 mothers are private employees, whose working hours are quite dense, from morning to evening. Therefore, this is closely related to the busy factor of each mother[18][36].

Putri asserts that knowledge originates from human senses, or from learning about items through an individual's senses (eyes, nose, hearing, and so on). On its own, the level of attention and object perception has a significant impact on the senses' ability to generate information. The majority of an individual's information is obtained via their senses of sight (eyes) and hearing (ears) [12].

This is in line with research by Putri, Based on the results of the post-test conducted, an increase in family knowledge was obtained, namely with a percentage of 37.2% with good knowledge, 45.7% with sufficient knowledge, and 17.1% with less knowledge. Through health education about the Prevention of Tuberculosis transmission, there will be a transfer of information to respondents and they will sense the information so that the information they have increased, and finally their knowledge about preventing Tuberculosis transmission increases [12].

Research by Khairunnisa Data was obtained after providing educational interventions, namely the level of knowledge of cadres and parents about tuberculosis, in the good category far increased by 46 people (92.0%), while with the less category only 4 people (8.0%). The level of curiosity of cadres and parents is also quite good as evidenced by the activeness during the question and answer session [37].

The significant value (2-tailed) for both the pretest and post-test in the Wilcoxon Sign Rank Test results is 0.000. Given that the significant value is less than 0.05, it can be concluded that the health education media booklet has an impact on toddler tuberculosis in the Perak Timur Surabaya Health Center's working area.

According to research conducted by Putri, Several factors affect knowledge, namely education, information, culture, and experience. One factor that can influence someone's level of understanding is information. Information gathering can aid in the acquisition of new knowledge. Results with a p-value of 0.000 in this study indicated that there was a significant difference between respondents' knowledge of preventing tuberculosis transmission before and after receiving health education. [12].

This study has weaknesses and limitations in the implementation of data collection, as follows: The weaknesses of this study include the fact that not all respondents were available at the same time for data collection, resulting in data being gathered at different times for each respondent. Data collection was conducted door-to-door in two meetings, but some respondents had not reviewed the material by the second meeting. This necessitated additional time for respondents, thereby prolonging the study duration. Additionally, some respondents were passive and did not pose questions, prompting the researcher to suggest that health information could be sought not only from medical personnel or health cadres, but also from social media platforms such as Google, YouTube, and others.

V. CONCLUSION

This study examined the impact of a health education booklet on toddlers' maternal knowledge of tuberculosis in the Puskesmas Perak Timur Surabaya working area. Moms who have taken part in health education programs are better informed about toddler tuberculosis. More research may be conducted by creating more visually appealing material. Based on this research, regular health education from Puskesmas to the community is necessary, especially in RWs that rarely receive health education. This is to ensure that

health information is evenly disseminated among the population, enabling them to effectively prevent disease transmission. For future researchers, it is advisable to expand the scope of the study with different approaches and larger samples to investigate the impact of health education on tuberculosis in toddlers on maternal knowledge. In the data collection process, using more optimal techniques to obtain the necessary data is recommended.

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