THE EFFECT OF ONLINE-BASED EDUCATION ON TREATMENT ATTITUDES AND MEDICATION ADHERENCE OF TUBERCULOSIS PATIENTS AT THE DENPASAR CITY HEALTH CENTER

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ABSTRACT

Background: Tuberculosis is an infectious disease with a high prevalence rate in Denpasar City. Medication adherence affects increased tuberculosis cases in Denpasar City. Medication adherence in tuberculosis patients is associated with a low attitude toward treatment, so it is necessary to make efforts to improve treatment attitudes and medication adherence of tuberculosis patients by providing health education. Online-based education with Google Meet can be a solution in delivering health education with virtual face-to-face features, so education delivery becomes more effective. **Objective:** This study aims to determine the effect of online-based education on treatment attitudes and medication adherence of tuberculosis patients at the Denpasar City Health Center. **Methods:** The pre-experiment study used one group pretest-posttest design that was conducted from February until April 2022 at several public health centers in Denpasar City. The total samples of 30 tuberculosis patients accorded the inclusion criteria were taken by purposive sampling. A questionnaire was used to measure treatment attitudes, where online-based education is given a week after the pre-test and the post-test is given 2 weeks after online-based education. Pill-count method was used to measure medication adherence. Wilcoxon analysis was used to analyze research data. **Results:** Wilcoxon's analysis showed a significant increase in treatment attitudes and medication adherence of tuberculosis patients before and after online-based education with google meet ($p < 0.05$). **Conclusion:** Online-based education with google meet provides an increase in treatment attitudes and medication adherence of tuberculosis patients at the Denpasar City Health Center.
Keywords : Online-based Education; Treatment Attitudes; Medication Adherence; Tuberculosis

INTRODUCTION

Tuberculosis (TB) is the second highest cause of death in the world for infectious disease cases after HIV/AIDS. This infectious disease is caused by the bacterium Microbacterium tuberculosis. According to the World Health Organization, in 2017 Indonesia was in the second highest position in the world, the incidence of tuberculosis was 420.994 cases[1]. The high incidence of tuberculosis in Indonesia has an impact on several provinces, such as Papua, with 0.77% cases, which is the highest case prevalence among the 34 provinces in Indonesia, followed by Banten with 0.76% cases and West Java with 0.63% cases[2]. Bali is one of the provinces in Indonesia with tuberculosis cases that are still increasing every year[3].

According to research by Pandapotan (2017), the prevalence rate of adherence to OAT (Anti-tuberculosis Drugs) treatment is only 26%, so patient non-adherence in tuberculosis treatment has an impact on

dropping out or failure of therapy, which can result in the incidence of resistance to mycobacterium tuberculosis. Compliance with this treatment is related to the attitude toward the treatment of tuberculosis patients[4].

Based on this, efforts to improve treatment attitudes and medication adherence are carried out by providing health education[5]. Webinars are a technology that allows users to hold seminars, talk shows, discussions, and other activities online without having to meet face-to-face. One of the most frequently used web conferences is google meet. This media is an extraordinary innovation in the field of technology that serves as a medium for people to interact directly through images (video) or text (chat) and collaborate across wide geographic boundaries via the WWW[6].

This web-conference media has the advantage of two-way communication so that the effectiveness and involvement of participants are higher[6]. Until now, there has been no research related to the use of online-based educational media using the google meeting forum as a means to improve treatment attitudes and medication adherence in tuberculosis patients.

Therefore, it is important for the author to examine the effect of providing online-based education on treatment attitudes and medication adherence for tuberculosis patients at the Denpasar City Health Center. In an effort to improve treatment attitudes and medication adherence for tuberculosis patients, the health center as a primary healthcare facility has an important role in overcoming this tuberculosis disease.

METHODS

The pre-experiment study used one group pretest-posttest design that was conducted from February until April 2022 at several public health centers in Denpasar City. This research has obtained an ethical clearance permit from Sanglah Hospital Denpasar with the number 1247/UN14.2.2.VII.14/LT/2022.

The total samples of 30 tuberculosis patients accorded the inclusion criteria, including tuberculosis patients who are undergoing treatment for tuberculosis in the intensive and advanced phases at the Denpasar City Health Center, tuberculosis patients who are willing to become research respondents during the study, tuberculosis patients who can access or use the internet, tuberculosis patients with a pre-test score of on average (mean) were taken by purposive sampling.

Online interventions through Google Meetings using PowerPoint have been validated by experts (pharmacists, doctors, and the general public). A questionnaire was used to measure treatment attitudes, where online-based education is given a week after the pre-test and the post-test is given two weeks after online-based education. The treatment attitude questionnaire used is valid, which has an r-count greater than r-table 0.344 and is reliable, which has an r-*Alpha* value of 0.755> 0.60 [7]. Pill-count method was used to measure medication adherence. Wilcoxon analysis was used to analyze research data.

RESULTS

1. Characteristics of research subjects

Based on the characteristics of the research sample, namely age, gender, last education, and treatment phase of the respondents, descriptive results were obtained, which can be seen in table 1.

Based on the results of the data on the characteristics of the respondents in Table 1. it can be seen that of the 30 respondents, the

most are productive age 36-45 years, as many as ten respondents (33%). In the gender variable, the majority of respondents were male as many as 17 respondents (57%) and the rest were female as many as 13 respondents (43%), while for the level of education, the majority of respondents were senior high school (SHS) graduates as many as 14 respondents (47%). The treatment phase that was mostly carried out by tuberculosis patients at the Denpasar City Health Center was the advanced phase of 17 respondents (57%), while the intensive phase was 13 respondents (43%).

Table 1: Distribution of Respondents' Characteristics

Variable	Category	Frequency (n=30)	Percentage (%)
Age	17-25	8	27%
	26-35	5	17%
	36-45	10	33%
	46-55	6	20%
	56-65	1	3%
Gender	Male	17	57%
	Female	13	43%
Education	Elementary	5	17%
	JHS	4	13%
	SHS	14	47%
	Diploma	3	10%
	Bachelor	4	13%
Treatment Phase	Intensive	13	43%
	Advanced	17	57%

2. The Effect of Online-based Education on Treatment Attitude

Table 2: Statistical Analysis of Treatment Attitude

Variable	N	*Mean*	*Median*	SD	p-Value
(*Pre-Test*)	30	107,83	99,5	17,64	
(*Post-Test*)	30	112,63	107,5	13,81	0,003

Based on the results of Table 2. above, it is known that the number of each sample of

the variables is 30, the average treatment attitude (Pre-test) is 107.83, the median is 99.5 and the standard deviation is 17.64. The average treatment attitude (Post-test) was 112.63, the median was 107.5 and the standard deviation was 13.81.

The results of the Wilcoxon test showed that the p-value of the treatment attitude was 0.003 <0.05, so it was stated that there was a significant difference in the attitude of treatment before and after being given education.

3. The Effect of Online-based Education on Medication Adherence

4.

Table 3: Classification of Medication Adherence Levels with Pill-Count Method

Category	Before		After	
	(n=30)	%	(n=30)	%
Adheren	22	73,33%	28	93,34%
Non-Adheren	8	26,67%	2	6,66%

Based on Table 3. above, the proportion of patients who adhered to taking medication before being given education was only 73.33% (22 patients), while patients who did not adhere to medication were 26.67% (8 patients) out of a total of 30 patients. After being given online education, adherence to medication for tuberculosis patients who complied with taking medication was 93.34% (28 patients), while those who did not comply were 6.66% (2 patients). This shows an increase in medication adherence by tuberculosis patients after being given education through courage.

Table 4: Statistical Analysis of Medication Adherence

Variable	N	*Mean*	*Median*	SD	p-Value
Before	30	19,83	18	5,58	0,003
After	30	21,76	21	5,36	

Based on the results of Table 4. above, it is known that the average adherence to taking medication before education is 19.83, the median is 18 and the standard deviation is 5.58. The average adherence to taking medication after education was 21.76, the median was 21 and the standard deviation was 5.36. The results of the Wilcoxon test showed that the p-value of medication adherence was $0.003 < 0.05$, so it was stated that there was a significant difference in medication adherence before and after being given education.

DISCUSSION

In table 1. explains that of the 30 respondents, the most age group of tuberculosis patients is productive age 36-45 years as many as 10 respondents (33%). A crowded work environment can increase the risk of contracting pulmonary tuberculosis. These conditions make it easier for people of productive age to suffer from pulmonary TB more easily [8].

The results of this study also showed that the majority of respondents were male as many as 17 respondents (57%), and the rest were female as many as 13 respondents (43%). These results are in accordance with the literature where men are at greater risk of developing pulmonary TB disease compared to women. Where more men have the habit of smoking and drinking alcohol compared to women, smoking and alcohol can reduce the body's immunity so that it is more susceptible to pulmonary tuberculosis [8].

The majority of respondents are high school/vocational high school graduates, as many as 14 respondents (47%). Based on the results of research conducted by researchers looking at the last education category of pulmonary TB patients, the absorption capacity to find out pulmonary TB treatment is in the good category, but patients are less concerned about contracting pulmonary TB

disease or not. This happens because they do not apply a timely and nutritious diet, regular rest and an unguarded environment.

Based on the results of research conducted by researchers seen in Table 5.1, tuberculosis patients in several Denpasar City Health Centers dominantly carried out advanced phase treatment therapy, namely 17 respondents (57%), while those who carried out intensive phase therapy were 13 respondents (43%).

Based on the results of the pre-test and post-test analysis of treatment attitudes, it can be seen that the post-test mean value is greater than the respondent's pre-test mean value, with an average difference of 4.8. These results show a significant change, where the p-value is $0.003 < 0.05$, this means that there is an effect of online-based education on the treatment attitude of tuberculosis patients at the Denpasar City Health Center.

In this study, adherence to medication for tuberculosis patients was measured using the pill-count method. Determination of the patient's medication adherence by calculating the remaining medication from the patient or by "pill count" will get the percentage of compliance from the patient during therapy for a certain period of time. Compliance is stated by 80% and non-compliance <80% [9].

Based on Table 3. shows that the percentage of adherence to taking medication before being given education was 73.33% (22 patients) had moderate adherence (51-75%), while after being given online education on the 14th day, adherence to taking medication for tuberculosis patients was 93, 34% (28 patients) and had high adherence (76-100%).

Based on the results of this average compliance, it can be seen that the average value of compliance after education is greater than the average value of compliance before education, with an average difference of 1.93. These results indicate a significant change,

where the p-value is 0.003 <0.05, this means that H1 is accepted, which means that there is an effect of online-based education on drug adherence of tuberculosis patients at the Denpasar City Health Center.

Demographic data of respondents, such as education level, affect the treatment attitude and medication adherence of patients in this study, where most of them have a high school/vocational education level. Education is closely related to knowledge because the educational process increases intellectual maturity to have knowledge. The knowledge possessed by tuberculosis patients makes patients motivated to comply with therapy [10].

One of these improvements in treatment attitudes and medication adherence was obtained from a good understanding of tuberculosis therapy after being given online education on google meet. Providing effective medication education to patients will improve medication adherence by motivating patients to understand the use of medications and to actively participate in the management of their own health [11].

This is in line with the results of research conducted by researchers, where online education google meet is effective in increasing adherence to taking medication for tuberculosis patients at the Denpasar City Health Center because tuberculosis patients are enthusiastic about listening to material related to tuberculosis which is explained in the form of power points with a short duration of time and a concise presentation. Short, clear, and interesting, so that respondents are able to understand the important information points presented in the online education google meet and can be motivated to comply with the recommended treatment therapy.

The research process has been attempted to achieve the best results, but there are still limitations in this study, namely this study cannot be generalized, this is because the number of samples of tuberculosis patients is small and only uses a few health centers in Denpasar City, so it cannot use the control group as a comparison.

CONCLUSION

Based on the results of the study, it can be concluded that providing online-based education influences treatment attitudes and medication adherence of tuberculosis patients at the Denpasar City Health Center with a significance value of 0.003 (p<0.05).

CONFLICT OF INTEREST

There is no conflict of interest. The preparation of this article was made independently by the author without any third party.

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