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Use of Educational Media in Increasing Attitudes and Behavior of Pregnant Women About How to Wash Net Netting with Insecticide at Hope Health Center

Susi Lestari[A], Endah Purwanti Handayani[B]

Abstract

One of the deadly diseases is malaria because it is caused by the bite of a female Anopheles mosquito, in which there are parasites that are transmitted to humans so they become infected. Malaria is a serious disease and is a public health problem because of the high morbidity and mortality rates. This infectious disease can cause death, especially in high-risk groups such as infants, young children and pregnant women. Pregnant women are a vulnerable group to malaria. Malaria in pregnant women can cause various negative impacts on pregnant women and their fetuses. The purpose of this study was to find out the usefulness of poster educational media in improving the attitude and behavior of pregnant women in washing insecticidal mosquito nets as recommended. This research uses a *Quasi* experimental type of research with a Pretest-Posttest with Control Group Design. To see the possible cause and effect relationship between those given the intervention in the intervention group. Compare the results with a control group without intervention. In this study, 2 groups were used consisting of one intervention group and one control group. The research found that Pregnant women were of the ideal age as many as 682%, as many as 86% did not work and as many as 81.8% had moderate education. Poster educational media can increase knowledge with a calculated Z value of -3.624 and a Sig. of 0.000. Then poster educational media can improve attitudes with a calculated Z value of -3.299 and a Sig. of 0.043. Further poster educational media can improve behavior with a calculated Z value of -4.060 and a Sig. of 0.000.

***Keywords**: Malaria Posters, Pregnant.*

INTRODUCTION

One of the deadly diseases is malaria because it is caused by the bite of a female Anopheles mosquito, in which there are parasites that are transmitted to humans so they become infected (WHO, 2021). Malaria is a serious disease and is a public health problem because of the high morbidity and mortality rates. This infectious disease can cause death, especially in high-risk groups such as infants, young children and pregnant women. Pregnant women are a vulnerable group to malaria. Malaria in pregnant women can cause various negative

[A]*Midwifery Study Program, Jayapura High School of Health Sciences (STIKES), Indonesia, Email: Susilestaritarjo@yahoo.com*
[B]*Midwifery Study Program, Jayapura High School of Health Sciences (STIKES), Indonesia, Email: endahpurwantihandayani@gmail.com*

impacts on pregnant women and their fetuses (Ministry of Health, 2012).

Malaria cases throughout the world have not been resolved. This can be seen in data from various countries where malaria still exists. According to World Health Individualization (WHO, 2020). There were approximately 229 million malaria cases in 87 malaria-endemic countries in 2019, compared with 238 million in 2000. 29 countries accounted for 95% of malaria cases. It was reported that around 7.6 million people died from malaria cases in 2019.

Data on the incidence of malaria or API per 1,000 population by province in 2019 shows Papua Province as a whole at 64.3%, followed by West Papua province at 7.38%. NTT Province was 2.37% and Maluku Province was 0.72% and 0.55% in East Kalimantan Province (Ministry of Health, 2020).

One effort to prevent malaria is to use mosquito nets treated with insecticide. Using mosquito nets can prevent Anopheles from biting while sleeping at night. At night Anopheles actively looks for blood. Using mosquitoes can reduce the risk of Anopheles biting. Not biting means there is no contact between humans and mosquitoes that are active at night (Lewinsca et al., 2021). And there are several restrictions on washing mosquito nets treated with insecticide, including brushing, soaking or rubbing it. If soaked for at least 30 minutes with detergent, laundry soap, bleach or hot water, the insecticidal effect of mosquitoes will be greatly reduced. However, there are still many people who cannot wash mosquito nets treated with insecticide according to procedures. According to information received from the Harapan Community Health Center, the number of pregnant women is 43 and in February-April 2023. Based on the results of interviews with 5 pregnant women studied at the Harapan Community Health Center, there were 4 mothers who did not know how to wash mosquito nets treated with insecticide, and I Mothers cannot explain the steps for washing mosquito nets treated with insecticide in detail. Based on the description above, this research aims to find out "the benefits of educational media in increasing the knowledge, attitudes and behavior of pregnant women regarding washing insecticide nets at the Harapan Community Health Center".

LITERATURE REVIEW

Understanding Malaria

Malaria is a disease spread by the bite of female Anopheles mosquitoes. Malaria is caused by Plasmodium which belongs to the genus Plasmodia. Malaria is one of the most important health problems in the world. There are four broad types of malaria, namely tropical, tertian, ovale, and quartan. Every year, more than one million people worldwide die from malaria. Malaria is a disease caused by obligate intracellular protozoa of the genus Plasmodium. which is transmitted naturally through the bite of female Anopheles mosquitoes. Malaria can attack anyone. especially residents who live in mosquito breeding areas

(Arsin, 2012). The cause of malaria is the Plasmodium parasite which resides in human red blood cells to survive and reproduce.

Preventing Mosquito Bites by Using Insecticide Treated Mosquito Nets

The mosquito nets are processed in such a way that the insecticide is stored in the net fibers produced by the plant. The insecticide lasts longer than hand-dipped mosquito nets. Insecticide nets offer better protection for the user because they can kill/make mosquitoes unable to come into contact with the net.

Sleeping under an insecticide-treated mosquito net is the most effective way to prevent mosquito bites because mosquitoes bite at night. Soaking mosquito nets reduces exposure to mosquitoes by killing them if they stick to the net or by preventing them from approaching where the person is sleeping.

Use of insecticide-treated bed nets as a measure against malaria. Because mosquito nets are the main intervention in malaria endemic areas. Health workers must understand usage practices. Washing and maintaining mosquito nets that have been treated with long-term insecticide. Health workers must fully inform pregnant women during antenatal visits.

METHODS

This research was conducted at the Harapan Community Health Center, in May-June 2023. This research uses a *Quasi* experimental type of research with a Pretest-Posttest with Control Group Design. To see the possible cause and effect relationship between those given the intervention in the intervention group. Compare the results with a control group without intervention. In this study, 2 groups were used consisting of one intervention group and one control group. The intervention group received education and posters on how to wash insecticide-treated bed nets, while the control group only received education.

The population of this study was all pregnant women who underwent examinations at the Community Health Center from February to April 2023 and lived in the Harapan Community Health Center area, and were present during the research, totaling 43 people. The sampling technique used a total sampling method of 43 people.

The information collected and questionnaires filled out by respondents are ready to be processed. The data is processed by a program on an Excel computer or SPSS program. To ensure that all statements in the questionnaire have been filled in completely by the respondent. The researcher places a check mark next to the statement so that only complete information can be processed.

Data analysis consists of univariate and bivariate analysis. Univariate analysis was used to explain frequencies and proportions using the Chi- square test. Meanwhile, bivariate analysis consists of:

1. Gain index calculation
   To find out how much influence posters have on increasing knowledge. Attitudes and behavior. The calculation uses a gain index which can be calculated using the formula from Meltzer, namely:

$$Gain\ Index = \frac{\text{Score } posttest - \text{Score } pretest}{Maximum \text{ score} - \text{Score } pretest}$$

   The gain level criteria according to Hake can be seen in the following table. Gain Index Criteria.

Gain Index (g)	**Criteria**
$g > 0.7$	Tall
$0.3 < g \leq 0.7$	Currently
$g \leq 0.3$	Low

2. Average
   According to Sudjana, to determine the qualifications of learning outcomes achieved by respondents can be determined through an average formulated by:
   $\dot{x} = \Sigma\ fixi\ \Sigma fi$
3. Standard Deviation
   Standard deviation or sample standard deviation is used in calculating the zi value

$$S = \sqrt{\frac{\sum f_i(x_i - \bar{x})^2}{n-1}}$$

4. Wilcoxon test
   The Wilcoxon test is a statistical method used to test the differences between two paired pieces of data, so the number of data samples is always the same. Positive and negative signs and the difference between data pairs which are then ranked are the main elements used in the analysis. If the sample size n>25, then use the formula for the average and standard deviation
   $M_t = n\ (n+1)\ 4$
   $S_t = \sqrt{\frac{n\ (n+1)(2n+1)}{24}}$
   So, the standard normal variable is formulated:
   $Z = \frac{(t - m2)}{St}$

RESULTS

Description of Research Location

Harapan Community Health Center is located on Jalan Kalkhote Kampung Noloka with a building area of 18m x 8 m/3750 m^2 Staff (PKM Harapan Secondary Data. 2022), 2 General Practitioners. 2 Dentists, 15 Nurses, 17 Midwives. Health care for 4 people. 3 health workers, 4 nutrition workers, 4 laboratory workers, 3 pharmaceutical workers, non-medical employees. 2 people (I driver & I administration) and 1 other health worker.

Poster Media Development Using the ASSURE Method

Poster media development uses the ASSURE method, namely (Julioe, 2017):

1. *Analyze learner characteristics* (A).
2. Target pregnant women who check their pregnancy at the Harapan Health Center.
3. *State objectives (S).*
4. The behavior that will be formed is to wash insecticide-treated bed nets according to the procedure, paying attention to the steps in washing and what should not be done when washing insecticide-treated bed nets, so that the quality and effectiveness are maintained in protecting against malaria mosquito bites.
5. *Select or modify media (S).*
6. The media chosen is poster media.
7. *Utilize (U).*
8. Poster media was used for 2 months as a counseling tool for pregnant women respondents.
9. *Request learner response (R).*
10. Posters are used during counseling.
11. *Evaluatee (E)*

    Posters were evaluated by 3 people, including: I, a media expert. I am a linguist, I am a midwife.

    a. Cover: The assessment of the cover is good.
    b. Systematics: Assessment of the systematics is good and the material side is appropriate.
    c. Picture: The media's assessment of the image is generally good and the colors are clear
    d. Writing: The media's assessment of writing is generally good. Sentences are easy to understand but need to be enlarged further.
    e. Language: The media's assessment of language is generally good.

Univariate Analysis

Characteristics include age, education and occupation:

In this study, the characteristics of the respondents studied were age, occupation and education totaling 43 respondents (22 in the intervention group and 21 in the control group).

Table 1. Distribution of Characteristics of Respondents at Harapan Community Health Center

No	Characteristics	Intervention		Control	
	Mother's Age	n	%	n	%
1	Young	3	13.6	3	14.3
	Ideal	15	68.2	14	66.7
	Old	4	18.2	4	19.0
	Amount	22	100	21	100
	Mother's Job	n	%	n	%
2	Work	3	13.6	3	14.3
	Doesn't work	19	86.4	18	85.7

	Amount	22	100	21	100
	Education	n	%	n	%
3	Low	2	9.1	2	9.5
	Currently	18	81.8	17	81.0
	Tall	2	9.1	2	9.5
	Amount	22	100	21	100

Table 1 shows that the majority of respondents with the ideal age (20-35 years) in the intervention group were 15 (68.2%) and in the control group were 14 (66.7%). Characteristics of respondents based on work showed that the majority of mothers did not work, with 19 (86.4%) in the intervention group and 18 (85.7%). Characteristics of respondents based on education showed that the majority of mothers had moderate education (SMP-SMA) with 18 (81.8%) in the intervention group and 17 (81.0%) in the control group.

Attitudes and Behavior

Table 2. Distribution Attitudes and Behavior at Harapan Health Center

No	Variable	Intervention		Control	
1	Attitude	n	%	n	%
	Positive	14	63,6	11	52,4
	Negative	8	36,4	10	47,6
	Total	22	100	21	100
2	Behavior	n	%	n	%
	Suitable	6	27,3	4	19,0
	Unsuitable	16	72,7	17	81,0
	Total	22	100	21	100

Table 2 shows that the majority of respondents had a positive attitude in the intervention group, 14 (63.6%) and 11 (52.4%) in the control group. Behavioral variables: The majority of respondents behaved inappropriately in the intervention group, 16 (72.7%) and 17 (81.0%) in the control group.

Bivariate

Descriptive Data of Pretest and Posttest Attitude Results in the Intervention and Control Groups

1. Pretest and Posttest Attitude Data in the Intervention Group

Pretest data is the result before respondents receive intervention. This research intervention is in the form of education and posters. The attitude results before and after the intervention group test are as follows:

Table 3. Pretest and Posttest Results of Intervention Group Attitudes

Code	Pretest Score	Category	Posttest Score	Category
1	58	Not Enough	68	Good
2	58	Not Enough	72	Good
3	34	Not Enough	68	Good
4	58	Not Enough	75	Good

5	75	Good	75	Good
6	63	Good	75	Good
7	72	Good	75	Good
8	62	Good	75	Good
9	58	Not Enough	70	Good
10	70	Good	70	Good
11	48	Not Enough	68	Good
12	88	Good	88	Good
13	67	Good	70	Good
14	55	Not Enough	55	Not Enough
15	55	Not Enough	68	Good
16	70	Good	75	Good
17	61	Good	58	Not Enough
18	75	Good	75	Good
19	65	Good	88	Good
20	70	Good	75	Good
21	72	Good	72	Good
22	77	Good	77	Good

Based on Table 3 above, it is known that the posttest results show an increase in the pretest scores.

2. Pretest and Posttest Attitude Data in the Control Group

Pretest data is the result before respondents receive intervention, the treatment in this research is in the form of counseling. The results of the pretest and posttest attitudes of the control group are as follows:

Table 4. Pretest and Posttest Results of Control Group Attitudes

Code	Pretest Score	Category	Posttest Score	Category
1	61	Good	69	Good
2	61	Good	69	Good
3	68	Good	43	Not Enough
4	68	Good	72	Good
5	68	Good	68	Good
6	58	Not Enough	58	Not Enough
7	68	Good	68	Good
8	57	Not Enough	57	Not Enough
9	57	Not Enough	57	Not Enough
10	58	Not Enough	58	Not Enough
11	43	Not Enough	58	Not Enough
12	68	Good	68	Good
13	62	Good	62	Good
14	68	Good	72	Good
15	61	Good	63	Good
16	55	Not Enough	55	Not Enough

17	58	Not Enough	58	Not Enough
18	68	Good	72	Good
19	57	Not Enough	57	Not Enough
20	55	Not Enough	58	Not Enough
21	58	Not Enough	58	Not Enough

From the results of Table 4, it can be seen that the posttest value does not show an increase in the pretest value.

Descriptive Data on Pretest and Posttest Behavior Results in the Intervention and Control Groups

Pretest and Posttest Behavioral Data in the Intervention Group

Pretest data is the result before respondents receive intervention. This group treatment includes counseling and posters. The attitude results before and after the intervention group test are as follows:

Table 5. Pretest and Posttest Results of Intervention Group Behavior

Code	Pretest Score	Category	Posttest Score	Category
1	33	Not Enough	78	Good
2	41	Not Enough	78	Good
3	10	Not Enough	34	Not Enough
4	35	Not Enough	57	Not Enough
5	70	Good	75	Good
6	10	Not Enough	67	Good
7	40	Not Enough	67	Good
8	15	Not Enough	50	Not Enough
9	39	Not Enough	42	Not Enough
10	43	Not Enough	67	Good
11	67	Good	75	Good
12	80	Good	89	Good
13	50	Not Enough	75	Good
14	12	Not Enough	35	Not Enough
15	34	Not Enough	67	Good
16	70	Good	67	Good
17	42	Not Enough	50	Not Enough
18	33	Not Enough	50	Not Enough
19	80	Good	89	Good
20	40	Not Enough	67	Good
21	20	Not Enough	67	Good
22	67	Good	78	Good

The results of table 5 can be seen from the posttest value showing the increase in the pretest value. Overall, in the pretest and posttest developments, respondents experienced changes in behavior. The observed changes are an increase in behavior and what is not appropriate becomes appropriate.

Pretest and Posttest Behavioral Data in the Control Group

Pretest data is the result before the respondent receives the intervention. The treatment of this research is counseling. The attitude results before and after the control group test are as follows:

Table 6. Pretest and Posttest Behavior Results of the Control Group

Code	Pretest Score	Category	Posttest Score	Category
1	41	Not Enough	41	Not Enough
2	41	Not Enough	41	Not Enough
3	15	Not Enough	30	Not Enough
4	50	Not Enough	50	Not Enough
5	10	Not Enough	20	Not Enough
6	15	Not Enough	25	Not Enough
7	60	Not Enough	61	Good
8	31	Not Enough	42	Not Enough
9	42	Not Enough	43	Not Enough
10	50	Not Enough	67	Good
11	70	Good	67	Good
12	42	Not Enough	61	Good
13	42	Not Enough	61	Good
14	75	Good	77	Good
15	60	Not Enough	59	Not Enough
16	8	Not Enough	15	Not Enough
17	42	Not Enough	42	Not Enough
18	75	Good	70	Good
19	60	Not Enough	60	Not Enough
20	11	Not Enough	30	Not Enough
21	75	Good	67	Good

Data from table 6 can be seen that the posttest value does not show an increase in the pretest value.

Wilcoxon test

The Wilcoxon test is used to see the effectiveness of a treatment given, especially providing posters.

Attitude

Table 7. Wilcoxon Test Results for Attitude Variables Intervention Group and Control Group

Sig value	Post Test Intervention Pre-Test	Post Test Control Pre-Test
Z	-3.299b	-1.606b
Asymp. Sig. (2-tailed)	0.043	.108

Based on table 7, the results of the Wilcoxon test for attitudes in the Intervention group show a calculated Z value of -3.299 and a sig. of 0.043. So, it was formulated that there were differences in the results of the intervention group's attitudes before and after receiving treatment. The following table shows the data:

Table 8. Pretest and Posttest Attitude Analysis Data for the Intervention Group and Control Group

Descriptive Statistics					
	N	**Min**	**Max**	**Mean**	**Std. Deviation**
Pretest intervention	22	34	88	64.14	11,357
Posttest intervention	22	55	88	72.36	7,455
Pretest control	21	43	68	60.81	6,416
Posttest control	21	43	72	61.90	7,375

Table 8 shows that the intervention group score before treatment was 64.14. value after treatment 72.63. This shows that the value after treatment is greater than the value before treatment. Thus, it can be formulated that giving posters has an effect on the attitude of the intervention group.

Behavior

Table 9. Wilcoxon Test Results for Behavioral Variables in the Intervention Group and Control Group

Sig value	Post Test Intervention Pre-Test	Post Test Control Pre-Test
Z	-4.060b	-2.434b
Asymp. Sig. (2-tailed)	,000	,015

Table 9 of the Wilcoxon test results for behavior in the intervention group shows a calculated Z value of -4.060 and a sig. of 0.000, it can be formulated that there are differences in the behavior of the pre and post intervention groups after receiving treatment. The following table shows the data:

Table 10. Data Analysis of Pretest and Posttest Behavior of the Intervention Group and Control Group

Descriptive Statistics					
	N	**Min**	**Max**	**Mean**	**Std. Deviation**
Pretest intervention	22	10	80	42.32	22,064
Posttest intervention	22	34	89	64.73	15,606
Pretest control	21	8	75	43.57	22,160
Posttest control	21	15	77	49.00	17,900

Table 10 the average behavior of the intervention group before treatment was 42.32. while the behavior value after treatment was 64.73. This shows that the value after treatment is greater than the average before treatment. Thus, it can be formulated that the poster influenced the behavior of the intervention group.

DISCUSSION

Characteristics

And the results of the research can be seen that there were more pregnant women at the Harapan Community Health Center who were of the ideal age (20-35 years) in the intervention group, 15 (68.2%) and in the control group, 14 (66.7%). Meanwhile, in terms of employment, the majority of mothers did not work, with 19 (86.4%) in the intervention group and 18 (85.7%) in the control group. Characteristics of respondents based on education, the majority of mothers had moderate education (SMP-SMA) with 18 (81.8%) in the intervention group and 17 (81.0%) in the control group.

The results of this research are in line with the results of research conducted by Mariana in 2021 which showed that 48.7% of respondents aged between 20 and 29 years had a high level of education, namely high school, namely 43.6%. Most of the respondents had given birth twice, 42.3% and were pregnant in the first trimester, 41% were less than 43.6% of respondents had experienced malaria during pregnancy (Isir. 2021).

Pregnant women at Harapan Health Center were more likely to have less attitude variable of the majority of respondents was positive in the daily intervention group, 14 (63.6%) and the control group, 11 (52.4%). And the majority of behavioral variables were inappropriate in the intervention group, 16 (72.7%) and 17 (81%) in the control group.

There were 15 (72.7%) pregnant women who did not wash bed nets in the intervention group and 13 (61.9%) in the control group. Meanwhile, there were 6 (13.2%) people who washed mosquito nets in the intervention group and 8 (13.6%) in the control group.

The results of this study are not in line with the results of research conducted by Wahyu Aji Safrudin et al in 2022 which explained that all respondents washed their mosquito nets on the first wash during the period of use after 6 months. However, washing mosquito nets is done by soaking them in soapy water before washing and drying them in direct sunlight (Safrudin et al., 2022).

Posters are effective for improving attitudes

The results of the Wilcoxon test for attitudes in the Intervention group show a calculated Z value of -3.299 and a sig. of 0.043. So, it was formulated that there were differences in the attitude results of the intervention group before and after receiving the intervention and the average score of the intervention group before treatment was 64.14, and the score after treatment was 72.63. This shows that the value after intervention is greater than the value before intervention. Thus, it can be formulated that giving posters has an effect on the attitude of the intervention group. Meanwhile, the control group's calculated Z value was 1.606 and the sig was 0.108, so it can be formulated that there was no difference in the attitude results of the control group before and after receiving treatment and the average value before treatment was 60.81, after treatment the average was 61.90. This shows that the value after intervention is greater than the average before intervention. Even though statistically it shows a change in attitude after being given counseling, the increase is not very significant, this means that in the control group who were given counseling alone will not immediately change their attitude and usually the day is temporary.

The intervention group that was given posters had a greater influence on attitudes than those who did not receive posters. So, there is a need for poster media to change mothers' negative attitudes into positive ones in the hope that attitudes that have changed for the better will have an impact on their behavior. This is in line with the need for pregnant women to properly understand how to wash mosquito nets so that during pregnancy they can use clean and highly effective mosquito nets.

The habit of using mosquito nets is an effective measure to prevent and avoid contact between mosquitoes and healthy people while sleeping at night, because Anopheles mosquitoes have the habit of sucking blood at night, so it can prevent Anopheles mosquito bites. Even though respondents routinely use mosquito nets when sleeping. However, if you wash it incorrectly, the function of insecticide-treated mosquito nets will be the same as ordinary mosquito nets, making it very possible for mosquitoes to enter the house and bite (Darmawansyah, 2019).

Posters are effective for improving behavior

Based on the Wilcoxon test, the behavior of the intervention group shows a calculated Z value of -4.060 and a sig. of 0.000, it can be formulated that there is a difference in the behavior of the pre and post intervention groups after receiving treatment and the average value of the behavior of the intervention group before treatment is 42.32, while the behavior value after treatment was 64.73. This shows that the value after treatment is greater than the average before treatment. Thus, it can be concluded that the poster influenced the behavior of the intervention group. Meanwhile, in the Control group the calculated Z value was 2.434 and the sig was 0.015, so it was formulated that there was a difference in the behavior of the pre and post control group after receiving the intervention and the average value before treatment was 43.57. after treatment 49.00. This data shows that the value after intervention is greater than the average before intervention. Even though statistically it shows changes in behavior after being given counseling, the increase is not very significant, this means that in the control group who were given counseling alone, not much changed their behavior. because he forgot the washing procedure so he returned to his original habit. The intervention group that was given posters had a greater behavioral influence than those who did not receive posters. So, poster media is needed to change the behavior of pregnant women in washing insecticide-treated bed nets. The goal is that pregnant women are willing and willing to wash mosquito nets according to the steps, not just washing them but paying attention to the prohibitions on washing insecticide-treated mosquito nets. So that mosquito nets that have been washed do not reduce their efficacy in protecting Anopheles mosquitoes and other insects. Knowledge and attitudes alone are not enough without changes in behavior to maintain health during pregnancy.

The results of this research are in line with research conducted by Hironimus Mone Ngongo 2022 which said that behavioral factors are related to the incidence of malaria. However, apart from financial behavior, it also plays an important role for someone to pay attention to their own health because behavior is not solely the cause of an event but also because of someone's finances to do something so that it has an impact as if behavior is the main basis for the occurrence of an event, in this case the incident. malaria (Hironimus, 2022).

One way to increase knowledge, attitudes and behavior is to provide consistent education by adding other media such as posters so that pregnant women are interested in learning and changing their behavior. The factors that influence behavior are interest, education, age. experience and environment. This influences individuals to be able to increase knowledge and influence behavior regarding the steps for washing insecticide- treated bed nets and pay attention to things that are not permitted in washing bed nets.

CONCLUSIONS

The research found that Pregnant women were of the ideal age as many as 682%, as many as 86% did not work and as many as 81.8% had moderate education. Poster educational media can increase knowledge with a calculated Z value of -3.624 and a sig. of 0.000. Then poster educational media can improve attitudes with a calculated Z value of -3.299 and a sig. of 0.043. Further poster educational media can improve behavior with a calculated Z value of -4.060 and a sig. of 0.000.

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