Poltekita: Jurnal Ilmu Kesehatan
http://jurnal.poltekkespalu.ac.id/index.php/JIK

Vol.17 No.2 August 2023: Hal. 287-294
p-ISSN: 1907-459X e-ISSN: 2527-7170

Original Article

The Influence of Animated Video on Knowledge and Compliance of Pregnant Women About Tetanus Toxoid Immunization

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ABSTRACT

Pregnant mothers who are unaware of the risks of tetanus during pregnancy are more likely to die giving delivery or have their children die at birth. This study aimed to analyze the effect of sinusoidal runaway animation on the knowledge and adherence of pregnant women regarding tetanus toxoid immunization at the Tabongo Health Center. This study uses the Research and Development method with the Borg and Galt development model which will be used to develop and validate an animated video product. In combination with the quasi-experimental design, quantitative method using a nonequivalent control group design approach to determine the condition of the subjects in the intervention group and the control group before and after treatment. The study population comprised 265 pregnant women in the Tabongo Health Center area. A sample of 74 pregnant women was divided into two groups: intervention and control. The mothers' knowledge before being given Rumawa Sinusoid Animation education in the majority intervention group averaged 59.14. Mothers' knowledge after receiving Rumawa Sinusoid Animation education in the majority intervention group averaged 79.43. Mothers' knowledge before being given Text Animation education in the majority of the control group averaged 63.95. Mothers' knowledge after being given Text Animation education in the majority of the control group averaged 82.24. In Conclusion, Rumawa Sinusoid Animation Education's influence on increasing pregnant women's knowledge and compliance regarding Tetanus Toxoid immunization. It is hoped that further research using sound and images will also be investigated to provide varied results.

Keywords: Animated Video, Knowledge, Compliance, Tetanus Toxoid, Immunization.

https://doi.org/10.33860/jik.v17i2.2190

INTRODUCTION

In 1989, the World Health Assembly called for the elimination of neonatal tetanus in 1995. By 2000, 104 of 161 developing countries had achieved the elimination of neonatal tetanus [1,2]. As of February 2012, Pakistan is one of 34 countries that have yet to achieve elimination of maternal and neonatal tetanus[1]. The Elimination of Maternal Neonatal Tetanus Initiative,

launched by the United Nations Children's Fund, the World Health Organization, and the United States Nations Population Fund, has continued to spearhead efforts to eliminate maternal neonatal tetanus after 2005[3]. However, progress in global elimination has been delayed due to slow implementation of the recommended strategy [4].

The causes of Tetanus Neonatorum in Indonesia are various, namely due to childbirth assistance, care for the baby's umbilical cord, cutting the umbilical cord without using recommended or sterile tools, and as a result of unclean wounds, besides that, it is also caused by failure of antenatal care. Care (ANC) for pregnant women in TT immunization services [5]. Tetanus occurs due to handling labor and umbilical cord that is not clean. The initial symptoms of patients infected with tetanus are characterized by pain with stiffness in the muscles caused by a neurotoxin in closed wounds produced by the bacteria that cause tetanus, namely Clostridium Tetani [6].

The cause is a type of germ called Clostridium Tetani, a type of spore whose seeds are in the surrounding environment. Bacillus clostridium tetani is widely distributed in spore-forming soils. Tetanus germs in their lives do not require large amounts of oxygen (anaerobic). Tetanus toxoid immunization is a process that builds immunity in an effort to prevent tetanus infection. The tetanus vaccine is a weakened and purified tetanus toxin that is administered to someone during immunization [7,8].

Reducing the incidence of tetanus in mothers and infants is a key area of global public health policies. Although much progress has been made in reducing the incidence of maternal and neonatal tetanus over the past two decades, tetanus remains a major cause of preventable disease [9,10,11]. Without medical treatment, the mortality from neonatal tetanus approaches 100% [12,13,14]. Neonatal tetanus is a fatal infection caused by the bacterium Clostridium tetani in the neonatal period. Neonatal tetanus develops when the umbilical cord is contaminated with C. tetani spores because of unhygienic delivery or cord care practices after delivery[9,15]. This disease usually occurs in rural areas with poor access to health facilities [16,17]. Neonatal tetanus is a disease that always exists [18] and remains a major cause of infant and neonatal mortality in many developing countries [19,20].

Immunization programs are an important part of the health sector. This program aims to reduce morbidity, disability, and death from diseases that immunization can prevent. One of the important immunization programs recommended by the government is TT immunization (Tetanus Toxoid), which is a process to build immunity in an effort to prevent tetanus infection [21]. Tetanus Toxoid Immunization is a process used to build immunity to prevent tetanus infection [22].

One of the efforts to introduce and disseminate public knowledge about health is audiovisual media, which can be used to convey health messages to achieve counselling goals. Audiovisual media is a type of media which besides audio elements also contains visual elements such as video recordings, and audio slides. The ability of this audiovisual media is considered superior and interesting because it contains two elements, namely hearing and seeing [23]

The low level of knowledge and adherence to TT immunization in the working area of Tabongo Health Center has made researchers interested in conducting education through new techniques using video. Researchers have designed educational videos by using R&D methods. This educational video in the form of animation can help health workers and midwives educate pregnant women not only during ANC but also during pregnancy class activities and integrated service post activities.

This study aimed to analyze the effect of sinusoidal rumawa animation on pregnant women's knowledge and adherence to tetanus toxoid immunization at Tabong Health Center. The novelty of this research is that researchers will conduct educational videos for pregnant women to see increased knowledge and adherence in carrying out tetanus immunization

METHOD

The design of this study uses Research and Development (R&D) method with the Borg and Galt development model which will be used to develop and validate an animated video product [24]. In combination with the quasi-experimental design. the reason for using a quasi experiment is because the sample was taken using a purposive sampling technique. quantitative method using a nonequivalent control group design approach to determine the

condition of the subjects in the intervention and control groups before and after treatment. The study population comprised 265 pregnant women in the Tabongo Health Center area. A sample of 74 pregnant women was divided into two groups: intervention and control. Bivariate and univariate analyses were performed on the studied variables. Wilcoxon test analysis was used to determine the knowledge and compliance of pregnant women in carrying out TT immunizations against the use of animated and text videos. The Mann-Whitney test was used to determine differences in knowledge of pregnant women and compliance with TT immunization between the intervention and control groups. The ethical merit of the research was obtained from the ethical commission of the Faculty of Public Health, Hasanuddin University with number 606/UN4.14.1/TP.01.02/2023.

RESULTS

The univariate analysis aimed to obtain an overview of the distribution of respondents and describe the Effect of Rumawa Sinusoid Animation on the Knowledge and Compliance of Pregnant Women About Tetanus Toxoid Immunization. The respondents in this study were pregnant women who had never received TT immunization, and pregnant women who had completed TT 1 and TT 2 in the Tabongo Health Center Work Area.

Table 1. Knowledge of Mothers Pre Test and Post Test Before being given the text animation video (Control Group) and Rumawa Sinosoid animation video (Intervention Group)

Knowledge	N	Minimum	Maximum	Average ± SD
Intervention Group	37	30	85	59,14 ± 14,718
Control Group	37	38	86	63,95 ± 13,281

The average knowledge of mothers before being given animated video education in the intervention group was 59.14 with a minimum score of 30 and a maximum score of 85, with a standard deviation of 14.718.
Meanwhile, the 37 respondents in the control group before being given animated video education had an average score of 63.95 with a minimum score of 38 and a maximum score of 68, with a standard deviation of 13.281.

Table 2. Knowledge of Mothers' Pre Test and Post Test after being given a text animation video (Control Group) and Rumawa Sinusoid animation video (Intervention Group)

Knowledge	N	Minimum	Maximum	Average ± SD
Intervention Group	37	67	100	79,43 ± 8,656
Control Group	37	67	100	82,24 ± 7,729

Table 2 shows that the average knowledge of mothers after being given animated video education in the intervention group was 79.43 with a minimum value of 67 and a maximum value of 100, with a standard deviation of 8.656. Meanwhile, the 37 respondents in the control group after being given animated video education had an average score of 82.24 with a minimum score of 67 and a maximum score of 100 with a standard deviation of 7.729.

Bivariate analysis in this study aimed to determine the effect of Rumawa Sinusoid Animation on the Knowledge and Compliance of Pregnant Women on Tetanus Toxoid Immunization at Tabongo Health Center. If the data were normally distributed, a Paired T-Test was used.

The Paired T-Test was used to determine the difference between two variables that are still in one group, or it can also be interpreted to measure differences in the same sample but also in two measurements, the first pre-test and the second post-test. If the data were not normally distributed, the alternative was the Wilcoxon test. Based on the results of the data normality test, it was found that the significant results on the output of the SPSS knowledge scale before being given educational videos in the intervention group were 0.151 and in the control group were 0.112. If a decision is made with the applicable scale value, it is found that the value in the intervention group and the control group is > 0.05, which means that the data are normally distributed; therefore, the paired sample t-test was used.

Table 3. The Effect of Providing Educational Videos on Knowledge of Pregnant Women.

Knowledge	N	Mean	SD	p-value
Pre Intervention	37	59,14	14,718	0,000
Post Intervention		79,43	8,656	
Pre Control	37	63,95	13,281	0,000
Control Post		82,24	7,729	

Table 3 explains that in the intervention group, the average value of knowledge before being given the Rumawa Sinusoid Animation educational video was 59.14 w,dard deviation of 14.718. After being given an animated educational video, the Rumawa Sinusoid rose to 79.43, with a standard deviation of 8.656. In the control group, the average knowledge before being given animated educational videos and text was 63.95 with a standard deviation of 13.281. After being given animated educational videos and text, it increased to 82.24, with a standard deviation of 7.729.

Based on the paired t-test of the mother's knowledge before and after being given educational videos in the intervention group (given Rumawa Sinusoid educational videos) and the Control Group (given text videos), it was found that the p-value of the two groups was 0.000 (p <0.05). This shows that there was an effect of counselling on animation and text videos in the control group, and there was an effect of counselling on animated educational videos of Rumawa Sinusoid in the intervention group on increasing pregnant women's knowledge about Tetanus Toxoid immunization.

Table 4. The Effect of Educational Videos on Compliance with TT Injections in Pregnant Women

Obedience	N	Mean	SD	p-value
Pre Intervention	37	1,00	0,000	0,000
Post Intervention		1,32	0,475	
Pre Control	37	1,00	0,000	0,000
Control Post		1,49	0,507	

According to table 4, in the intervention group, the average value of knowledge before being given the Rumawa Sinusoid Animation educational video was 1.00, with a standard deviation of 0.000. After being given an animated educational video, the Rumawa Sinusoid rose to 1.32 with a standard deviation of 0.475. In the control group, the average value of knowledge before being provided animated educational videos and text was 1.00, with a standard deviation of 0.000. After being given animated educational videos and text, it rose to 1.49 with a standard deviation of 0.507.

Based on the paired t-test of the mother's knowledge before and after being given educational videos in the intervention group (given Rumawa Sinusoid educational videos) and the Control Group (given text videos), it was found that the p-value of the two groups was 0.000 (p <0.05). This shows that there was an effect of counselling on animation and text videos in the control group. There was an effect of counselling on animated educational videos of Rumawa Sinusoid in the intervention group on increasing compliance of pregnant women to carry out Tetanus Toxoid immunization, which shows that counseling had an effect on animation and text videos in the control group. There was an effect of counselling on animated educational videos of Rumawa Sinusoid in the intervention group on increasing pregnant women's compliance to Tetanus Toxoid immunization. Knowledge of tetanus toxoid immunization in pregnant women means that the pregnant mother understands and can apply it during pregnancy. This knowledge can be in the form of benefits obtained when carrying out immunizations, schedules for implementation, possible side effects and so on [25]. table 4.8 explains that in the intervention group, the average value of knowledge before being given the Rumawa Sinusoid Animation educational video was 59.14 with a standard deviation of 14.718. After being given an animated educational video, the Rumawa Sinusoid rose to 79.43, with a standard

deviation of 8.656. In the control group, the average knowledge before being given animated educational videos and text was 63.95 with a standard deviation of 13.281. After being given animated educational videos and text, it increased to 82.24, with a standard deviation of 7.729.

Based on the paired t-test of the mother's knowledge before and after being given educational videos in the intervention group (given Rumawa Sinusoid educational videos) and the Control Group (given text videos), it was found that the p-value of the two groups was 0.000 ($p < 0.05$). This shows that there was an effect of counselling on animation and text videos in the control group, and there was an effect of counselling on animated educational videos of Rumawa Sinusoid in the intervention group on increasing pregnant women's knowledge about compliance with Tetanus Toxoid immunization. This research is in line with [26,27] knowledge will increase after counselling or education.

Another research that is in line with this research is the research conducted by [28]. The statistical test using the Wilcoxon test obtained a p-value of 0.000, meaning that p is less than 0.05 ($0.000 < 0.05$), so it can be concluded that Ha is accepted and Ho is rejected, meaning that health education media animated videos affect adolescents knowledge of HIV/AIDS at SMK Negeri 2 Makassar.

Other research that is in line is research conducted by [29] with a value of $p = 0.001$, which is less than 0.05 ($0.001 < 0.05$) therefore, it can be concluded that there is a difference in PHBS between the experimental group and the control group. Based on the research analysis results, both in the intervention and control groups before and after counselling, there was an increase in knowledge, where the pre-test to post-test distance was two weeks. The results obtained show a change in knowledge, because within two weeks, the researcher monitors the progress of the respondent through group discussion, where in this group the researcher always reminds, guides, and discusses with the respondent regarding matters related to tetanus toxoid immunization, so that the respondent understands the training material better. The use of media in health education can have a significant impact on the acceptance of the information conveyed. Media in the health education process is based on the principle that all human knowledge is received or based on the five senses [30].

One strategy to change one's knowledge about the important benefits of TT immunization is to provide information through health education or health promotion that can increase knowledge about TT immunization itself [31]. Video is an educational method that is expected to provide innovation in changing counselling methods [32]. The use of health videos can increase knowledge, awareness, understanding, and change behavior regarding the importance of TT immunization in pregnant women [33]. Health education can be run effectively when using educational media. One of the media that can be used is animated video. According to the results of research conducted by [34] states, health education using audio-visual information increases knowledge, attitudes, and actions more than leaflet media [34].

In addition, even though the appearance of the counselling material between the intervention group and the control group was different, the material provided was sufficient to attract the attention of the control group and the intervention group respondents because the media used was rarely used by local health workers and was different from the counselling that was often given. Another factor that influences is the technology that is developing in society, which makes it easier for respondents to find information other than the counselling material provided by researchers.

With the existence of educational videos for the two groups, both control and intervention, text animation videos, and educational videos for Rumawa Sinusoid, the average mother's knowledge about Tetanus Toxoid Immunization increased. Even though the increase in knowledge was significant, some only increased a few points of knowledge or even some did not experience an increase at all. The results obtained from the two intervention groups revealed that the knowledge of pregnant women increased after being given different interventions in each group.

Animated videos about health were created by presenting a combination of pictures with words that respondents could understand. A series of pictures and words that, when

combined, are more effective in retaining memory than using only pictures or words. According to [35], animation is a series of images arranged sequentially or known as frames. Each frame consisted of one image. Animation can explain concepts or processes that are difficult to explain using other media. Animation also has aesthetic appeal, and an attractive and eye-catching appearance motivates users to engage in the learning process.

According to Table 4, in the intervention group, the average value of knowledge before being given the Rumawa Sinusoid Animation educational video was 1.00, with a standard deviation of 0.000. After being given an animated educational video, the Rumawa Sinusoid rose to 1.32 with a standard deviation of 0.475. In the control group, the average value of knowledge before being provided animated educational videos and text was 1.00, with a standard deviation of 0.000. After being given animated educational videos and text, it rose to 1.49 with a standard deviation of 0.507.

Based on the paired t-test of the mother's knowledge before and after being given educational videos in the intervention group (given Rumawa Sinusoid educational videos) and the Control Group (given text videos), it was found that the p-value of the two groups was 0.000 ($p < 0$). This shows that there is an effect of counselling on animation and text videos in the control group and on animated educational videos of Rumawa Sinusoid in the intervention group on increasing compliance of pregnant women to carry out Tetanus Toxoid immunization.

From the statistical test results, it can be seen that the average at the beginning of the research, namely before being given counselling using educational media in both the intervention group and the control group, it was seen that all new respondents received the first tetanus toxoid immunization but there was a change in the number of respondents who carried out immunizations at intervals 2 weeks from the pre-test to the post-test, this according to the researchers that the provision of education or outreach using the media either by using the Rumawa Sinusoid animation video in the control group or videos in the form of text in the control group can increase adherence to injecting tetanus toxoid in pregnant women, p. This was because the respondents understood the impact of immunization on the health of mothers and babies.

In this study, it was also seen that even though educational videos had been given to the intervention and control groups, not all respondents increased their adherence to performing immunizations. The family, in this case, the husband, and the service flow sometimes makes patients reluctant to take advantage of existing health facilities.

CONCLUSION

The impact of Rumawa Sinusoid Animation Education can increase knowledge and compliance of pregnant women regarding Tetanus Toxoid immunization, as evidenced by the results of the analysis of the p-value (0.000) < alpha value (0.05). It is hoped that staff can provide health information about the importance of Tetanus Toxoid immunization, especially for pregnant women, as a follow-up to prevent tetanus disease by using video animation media. The limitation of this research is that it was not examined in depth regarding intermediary factors. Further research should be carried out by looking at deeper variables such as intermediary factors for TT immunization compliance in pregnant women.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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