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EFFECTIVENESS OF TRIPLE ELIMINATION FLIPCHART (LEB3E) IN IMPROVING PREGNANT WOMEN'S KNOWLEDGE, ATTITUDES, AND PREVENTIVE ACTIONS

Efektivitas Lembar Balik Triple Elimination (LeB3E) dalam Meningkatkan Pengetahuan Sikap dan Tindakan Pencegahan Ibu Hamil

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ABSTRAK

Triple Elimination program bertujuan untuk mencegah transmisi vertikal HIV, hepatitis B, dan sifilis pada bayi baru lahir. Namun, efektivitas edukasi bagi ibu hamil masih menjadi tantangan. Lembar Balik Triple Elimination (LeB3E) dikembangkan sebagai media edukasi interaktif yang diharapkan lebih efektif dibandingkan leaflet dalam meningkatkan pengetahuan, sikap, dan tindakan ibu hamil terhadap pemeriksaan triple elimination. Metode penelitian ini menggunakan desain randomized pretest-posttest control group dengan metode purposive sampling. Sampel dibagi menjadi dua kelompok: kelompok intervensi yang diberikan edukasi menggunakan LeB3E dan kelompok kontrol yang diberikan leaflet. Pengukuran dilakukan sebelum dan sesudah intervensi menggunakan kuesioner yang mengukur pengetahuan, sikap, dan tindakan, kemudian dianalisis menggunakan paired sample t-test dengan SPSS. Hasil penelitian menunjukkan bahwa penggunaan LeB3E lebih efektif dibandingkan dengan leaflet dalam meningkatkan pengetahuan, sikap, dan tindakan ibu hamil terkait pemeriksaan triple elimination. Peningkatan yang lebih signifikan terlihat pada kelompok intervensi dibandingkan kelompok kontrol. Lembar Balik Triple Elimination (LeB3E) terbukti lebih efektif dalam meningkatkan pengetahuan, sikap, dan tindakan ibu hamil terhadap pemeriksaan triple elimination dibandingkan leaflet. Integrasi LeB3E dalam pelayanan antenatal direkomendasikan sebagai strategi edukasi dalam mendukung upaya pencegahan transmisi vertikal HIV, hepatitis B, dan sifilis.

Kata Kunci: *ibu hamil, lembar balik, pendidikan kesehatan, triple elimination*

ABSTRACT

The triple elimination program aims to prevent the vertical transmission of HIV, hepatitis B, and syphilis in newborns. However, the effectiveness of educational efforts for pregnant women remains a challenge. The Triple Elimination Flip chart was developed as an interactive educational tool, expected to be more effective than leaflets in improving pregnant women's knowledge, attitudes, and preventive actions regarding triple elimination screening. This study employed a randomized pretest-posttest control group design with purposive sampling. Participants were divided into two groups: an intervention group that received education using LeB3E and a control group that received a leaflet. Measurements were taken before and after the intervention using a questionnaire assessing knowledge, attitudes, and actions, and the data were analyzed using paired sample t-tests in SPSS. The results showed that LeB3E was more effective than leaflets in enhancing pregnant women's knowledge, attitudes, and preventive actions regarding triple elimination screening. The intervention group demonstrated a significantly greater improvement compared to the control group. The Triple Elimination Flip chart has proven to be a more effective educational tool than leaflets in increasing pregnant women's knowledge, attitudes, and actions towards triple elimination

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screening. Integrating LeB3E into antenatal care services is recommended as an educational strategy to support efforts in preventing the vertical transmission of HIV, hepatitis B, and syphilis.

Keywords: flip chart, health education, pregnant women, triple elimination

INTRODUCTION

The WHO regional framework aims to ensure every baby is born without being infected with HIV, hepatitis B and syphilis.[1] Indonesia is still lagging behind in achieving the global target of HIV control. As of December 2022, the first achievement (95% diagnosis of ODHIV) has only reached 81%, the second achievement (95% receiving ARV treatment) is only 41%, and the third achievement (95% with viral suppression) is only 19%.[2] In addition, based on the WHO's Global Hepatitis Report 2024, viral hepatitis is the second deadliest infectious disease in the world, with a death rate of 1.3 million per year.[3] In Indonesia, Riskesdas 2013 recorded a prevalence of hepatitis B at 7.1% and hepatitis C at 1%, with less than 1% of patients receiving treatment each year.[4]

The high maternal mortality rate (AKI) in Indonesia, which reached 189 per 100,000 live births according to the 2020 Population Census, shows that infectious diseases such as HIV, syphilis, and hepatitis B have a major role in increasing the risk of maternal morbidity and mortality.[4] The risk of transmission from mother to baby can be reduced with early detection and appropriate medical intervention during pregnancy. As a strategic step, the government implemented the Triple Elimination Program, which aims to stop the transmission of HIV, syphilis, and hepatitis B from mother to child, as stipulated in the Regulation of the Minister of Health of the Republic of Indonesia Number 52 of 2017.[5,6]

In South Tangerang City, the Health Office recorded 148 cases of pregnant women who were detected positive for hepatitis B out of a total of 12,484 pregnant women.6 HBsAg examination before childbirth is an important step in screening to detect possible hepatitis B transmission. Therefore, increasing the knowledge of pregnant women is a crucial cognitive aspect in encouraging preventive measures.[7]

This research is also enriched with an approach from the COM-B Model (Capability, Opportunity, Motivation - Behavior) developed by Michie, 2020. This model states that behavior change can be achieved if a person has sufficient ability, opportunity, and motivation to perform the action. In the context of pregnant women's education, COM-B helps identify barriers and drivers that influence infection prevention behaviors, so that interventions can be tailored to individual needs.[8,9],

Visual educational media such as flipcharts have proven to be more effective in conveying health messages than conventional print media. A study shows that the use of flipcharts in health education significantly increases pregnant women's knowledge.[10] Another study shows that the use of interactive interpersonal communication media has a significant impact on changes in pregnant women's behavior in efforts to prevent infectious diseases. Two-way communication between health workers and pregnant women can improve understanding and compliance with health protocols.[11]

Based on this background, LeB3E was developed as an interactive educational media to improve pregnant women's understanding of triple elimination examinations, namely early detection of HIV, syphilis, and hepatitis B. This media is designed to overcome the limitations of conventional leaflets that only provide brief information and do not support two-way communication between midwives and pregnant women. This flipchart is made with a size of 21x31 cm in the form of a flipchart and

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uses 260 g art cartoon material with a doff finish and a white spiral with a diameter of 2.5 cm.

Each sheet contains attractive pictures with striking colors for pregnant women and detailed explanations for midwives. The information structure in LeB3E includes, basic explanations of triple elimination, procedures, and possible side effects, descriptions of images and texts to make it easier for pregnant women to understand information.

An examination flow sheet that helps pregnant women in following the triple elimination stage. Evaluation sheets and reminders for midwives and pregnant women to ensure follow-up after the examination. The advantages of LeB3E over leaflets include more systematic information delivery, interactive communication between midwives and pregnant women, and flexibility in use in health facilities.

The stages that have been carried out in the research on the effectiveness of LeB3E compared to leaflets in the Work Area of the Pondok Aren Health Center, South Tangerang City, several stages have been carried out, namely preliminary studies, preparation and testing of instruments, collaboration with the health center and identification of respondents, data collection and intervention, data analysis and evaluation.

METODE

This study was a quasi-experimental study with *The Randomized Pretest and Posttest Control Group Design*. This design includes non-random group division, where intervention and control groups are determined based on specific criteria.

This study has independent variables in the form of Triple Elimination Return Sheet (LeB3E) and Triple Elimination Examination Leaflet, while dependent variables include knowledge, attitudes, and actions of pregnant women related to Triple Elimination examination to detect HIV, syphilis, and hepatitis B during pregnancy. Knowledge includes an understanding of the importance of the examination, the benefits to the mother and baby, the procedure and nature of the examination, as well as the follow-up actions after obtaining the results. Attitudes include willingness and readiness to undergo examinations, views on the benefits, and perceptions of disease risk for pregnancy and babies. Meanwhile, actions include compliance with the examination, following follow-up procedures according to the results obtained, and implementing preventive measures to reduce the risk of transmission to infants and couples. This study evaluates the extent to which health promotion media, namely the Triple Elimination Return Sheet (LeB3E) and the Triple Elimination Examination Leaflet, can increase awareness, readiness, and compliance of pregnant women in undergoing examinations and take appropriate actions based on the results.

The population of this study was a first-trimester pregnant woman who undergoes *a Triple Elimination examination* at the Pondok Aren Health Center, South Tangerang City. The sample was selected using the nonprobability purposive sampling method to ensure that respondents met the inclusion criteria, namely pregnant women in the first trimester who underwent pregnancy examinations at the Health Center and exclusion criteria, namely pregnant women in the first trimester who were in an emergency medical condition, so it was not possible to be provided with counseling, education, and information regarding the Triple Elimination examination, and pregnant women who did not continue the examination at the Health Center Pondok Aren or could not be contacted during the intervention period. The number of samples used was 82 people, which were divided into 41 people in the control group (received education through leaflets) and 41 people in the intervention group (received education using *Triple Elimination Flip chart*s).

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The instruments and measurements of this study used questionnaires to assess the knowledge, attitudes, and actions of pregnant women related to *Triple Elimination*. Validity and reliability tests were conducted prior to the study, with *Cronbach's Alpha* value ≥0.7, indicating a reliable instrument. Education using the Triple Elimination Flip chart (LeB3E) was given to the intervention group 2 times a week for 1 month, so that there were a total of 8 educational meetings. Each session lasts 10 minutes and is given during a scheduled antenatal care (ANC) visit. In each session, health workers delivered material through interactive Flip charts, then continued with a short question and answer session to ensure understanding of pregnant women. If needed, the material will be reinstated at the next meeting to ensure improved understanding and behavior change.

The bivariate analysis used the *Paired t-test* to measure differences before and after the intervention, as well as the *N-Gain Test* to assess the effectiveness of improved knowledge, attitudes, and actions. Ethical EligibilityThis research has been approved by the Health Research Ethics Committee of STIKes Dharma Husada (No. 23/KEPK/SDHB/B/V/2024).

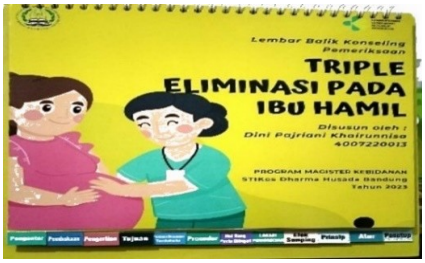

Figure 1. Triple Elimination *Flip chart Front View* (LeB3E)

The Triple Elimination Flip chart (LeB3E) is an interactive educational medium designed to make it easier for pregnant women to understand the triple elimination examination procedure to carry out early detection related to diseases and complications/ complications of pregnancy including HIV, syphilis, and hepatitis B tests, syphilis, hepatitis B, birth control, safe childbirth, anticipation of referrals, and maternal nutrition.

This leaflet consists of several key components designed to support pregnant women and health workers. The front view has an attractive design with striking colors to attract the attention of pregnant women (Figure 1). The midwife section presents detailed information sourced from reliable references, making it easier for health workers to provide accurate education. The patient section contains a brief explanation accompanied by informative illustrations to make it easier to understand. Checkup reminders help pregnant women and midwives record and review previous checkup history to support early diagnosis. Finally, the examination flow sheet explains the stages of the examination process, from patient arrival to report results, so that it becomes a clear guide for patients and health workers. LeB3E is designed to increase the effectiveness of pregnant women's health education through two-way communication that is more interactive and in-depth than conventional educational media such as leaflets.

RESULT

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In table 1, the majority of respondents are in the age range of 20-35 years (75.6%), which is the optimal reproductive age. Most have secondary education (63.4%) and are housewives (70.7%), which allows them to participate in more health education. As many as 46.3% are primigravida that require more pregnancy information than multigravida (53.7%). The distribution of characteristics between the intervention and control groups was relatively balanced (p >0.05), so that the two groups could be validly compared in the intervention analysis.

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Table 1. Respondent Characteristics

Characteristics	Category	Intervention Group (n=41)	Control Group (n=41)	Total (n=82)	%
Age	<20	4 (9,8%)	6 (14,6%)	10	12,2%
	20-35	32 (78,0%)	30 (73,2%)	62	75,6%
	>35	5 (12,2%)	5 (12,2%)	10	12,2%
Education	Elementary/Junior High School	5 (12,2%)	7 (17,1%)	12	14,6%
	High School/equivalent	27(65,9%)	25 (61,0%)	52	63,4%
	College	9 (22,0%)	9 (22,0%)	18	22,0%
Work	Housewives	28 (68,3%)	30 (73,2%)	58	70,7%
	Work	13 (31,7%)	11 (26,8%)	24	29,3%
Paritas	Primigravida	20 (48,8%)	18 (43,9%)	38	46,3%
	Multigravity	21 (51,2%)	23 (56,1%)	44	53,7%

Bivariate Analysis

Table 2. Frequency Distribution of Pretest and Posttest Knowledge Scores of Pregnant Women

Knowledge Level	Intervention Group	Control Group
Pretest		
Good	0 (0%)	0 (0%)
Fair	4 (9.8%)	1 (2.4%)
Poor	37 (90.2%)	40 (97.6%)
Posttest		
Good	34 (82.9%)	27 (65.9%)
Fair	7 (17.1%)	14 (34.1%)
Poor	0 (0%)	0 (0%)

The results of the study in Table 2 There was a significant increase in the level of knowledge of pregnant women after intervention with LeB3E. Prior to the intervention, the majority of respondents in the intervention group had a 'less' level of knowledge. After being given LeB3E, most of them increased to the 'good' category (p=0.005). This shows that interactive-based educational media is more effective than leaflets in increasing the understanding of pregnant women.

Table 3 Distribution of *Pretest* and *Posttest Score* Frequency of Pregnant Women's Attitude

Attitude	Intervention Groups	Control Group
Pretest		
Positive	15 (36,6%)	15 (36,6%)
Negative	26 (63,4%)	26 (63,4%)
Posttest		
Positive	41 (100%)	31 (75,6%)
Negative	0 (0%)	10 (24,4%)

In table 3, the results show that intervention with LeB3E has a positive impact on the attitude of pregnant women. Before the intervention, the majority of respondents in both groups had negative attitudes. However, after being given LeB3E, all respondents in the intervention group showed a positive attitude (p=0.001), while in the control group only 75.6% experienced a change in attitude.

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Table 4. Frequency Distribution of Pretest and Posttest Action Scores of Pregnant Women

Action	Intervention Group	Control Group
Pretest		
Did not act	15 (36.6%)	20 (48.8%)
Took action	26 (63.4%)	21 (51.2%)
Posttest		
Did not act	0 (0%)	5 (12.2%)
Took action	41 (100%)	36 (87.8%)

In table 4, the results are obtained, a significant improvement is also seen in the aspect of action. In the intervention group, after being given LeB3E, all respondents began to implement the recommended actions (p=0.007). In contrast, in the control group, there were still 12.2% who did not take action.

Table 8 Use of *N-Gain Score* on the Effectiveness of *Triple Elimination* Flip chart Compared to *Leaflet*

Media	*N-Gain Score*	Information
Flip chart *Pretest* Intervention *Posttest* Intervention	68,21	Fair
Leaflets *Pretest* Control *Posttest* Control	38,25	Poor

Based on Table 8, the difference in effectiveness between the Triple Elimination Flip chart and the leaflet is reflected in the N-Gain score. LeB3E has an N-Gain of 68.21% which is included in the 'sufficient' category, while the leaflet only reaches 38.25% which is classified as 'lack'. This difference shows that LeB3E is more effective in improving pregnant women's knowledge compared to conventional leaflets.

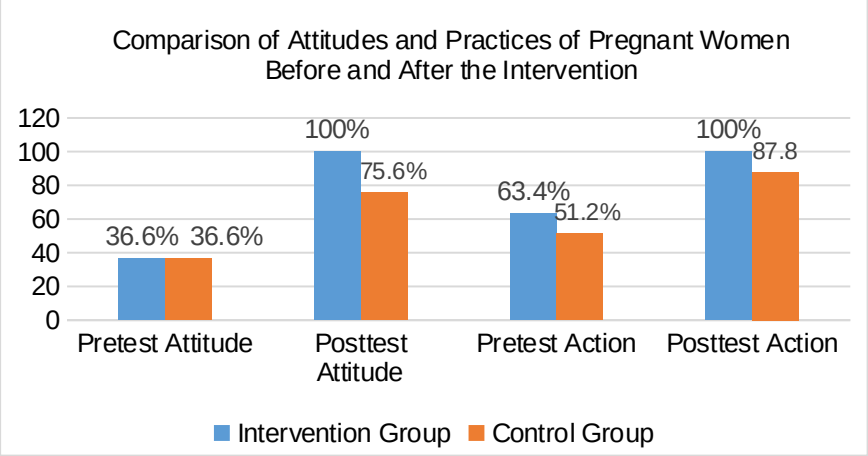

Figure 1. Comparison Diagram of Maternal Attitudes and Actions Before and After Intervention

The bar chart in Figure 1 shows a comparison of the attitudes and actions of pregnant women before and after the intervention in the intervention and control groups. This diagram shows a significant improvement in the intervention group after the use of the Triple Elimination Flip chart (LeB3E).

DISCUSSION

The Effectiveness of the Use of *Triple Elimination* Flip chart (LeB3E) on Improving Pregnant Women's Knowledge

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Knowledge plays a key role in influencing behavior. Although it does not directly change actions, a deep understanding and ability to recall information can positively impact behavior. Flip charts serve as an effective medium for delivering new information through engaging text and visuals, making it easier to understand. This tool supports government programs, particularly mandatory triple elimination screenings for pregnant women.

Based on the results of the study, there are differences in the use of *Triple Elimination* Flip chart (LeB3E) on the knowledge of pregnant women. The control group had an average *posttest* score of 75.5, while the intervention group had an average score of 79.9. With the results of the knowledge test showing a value of p=0.005 (p<0.05), it can be concluded that the *Triple Elimination* Flip chart (LeB3E) is more effective than the *leaflet* in improving the knowledge of pregnant women in the Pondok Aren Health Center Working Area, South Tangerang City.

The results of Sudiarti's research found that Flip charts are more effective in increasing this knowledge. A study on the effectiveness of health education using Flip charts revealed that the p-value for the pretest knowledge variable on the *Triple Elimination* Flip chart (LeB3E) was 0.057 (>0.05).[8] These findings are in line with Nugraheni's research which examines the impact of counseling using Flip charts on pregnant women's knowledge about exclusive breastfeeding. Knowledge measurement is usually carried out through interviews or questionnaires that ask questions related to the material to the respondents, adjusted to the level of knowledge to be measured. Generally, the types of questions for knowledge measurement are divided into two categories.[12] The p-value for the posttest knowledge variable in the *leaflet* was 0.202 (> 0.05). Because this p-value was greater than 0.05, the test results showed that there was no significant difference between respondents' knowledge before treatment in the flip group (p > 0.05). Thus, it can be concluded that there is no significant difference.

The Effectiveness of the Use of *Triple Elimination* Flip charts (LeB3E) on Pregnant Women's Attitudes

In line with research conducted by Jenahara et al., which showed a change in mother's knowledge and attitude after being given a Flip chart. Attitude itself is a person's tendency to respond to a social situation, whether in the form of institutions, individuals, ideas, or concepts positively or negatively. Attitude can be defined as a hidden reaction that reflects a person's interest, dislike, or even neutral attitude towards a certain object.[13]

Flip charts is a print medium similar to an album or calendar that has an image on one side and image-related information or explanations on the other. Flip charts are easy to use and easy to understand, thus helping people learn more. *A leaflet* is a sheet of paper with short, concise, and easy-to-understand writing, while this medium presents clearer images and more complete material.[14]

The Effectiveness of the Use of Flip chart *Triple Elimination* (LeB3E) on the Actions of Pregnant Women in the Working Area of the South Tangerang City Health Center

The results of the analysis showed that the use of Flip chart *Triple Elimination* in the control group had an average value of 65.8, while the intervention group had an average value of 73.5. With the skill results showing r=0.007 (r<0.05), it can be concluded

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that Flip chart *Triple Elimination* is more effective than *leaflets* in improving the actions of pregnant women in the Work Area of the Pondok Aren Health Center, South Tangerang City. The main difference between the paradigm of social definition and the former paradigm of social facts is the recognition of the subjective understanding of the individual. Social facts are considered independent of the individual and cannot be reduced to individual facts.[13]

According to the researcher, the use of Flip chart media such as LeB3E provides visualization that makes it easier for pregnant women to understand the information conveyed. This visualization is very important, especially for pregnant women with low or limited literacy levels. With simple pictures and explanations, complex information can be conveyed more effectively.

According to researchers, changes in the behavior of pregnant women are an indicator of the success of LeB3E use. Research shows an improvement in healthy behavior in pregnant women after the intervention. Information delivered continuously through Flip charts helps pregnant women remember the importance of maintaining health. Thus, LeB3E not only serves as an educational tool, but also as an effective reminder in everyday life.

This is in line with Sutrisno's research showing that health promotion media in the form of Flip charts is effective in learning and public health education for various topics. The use of Flip charts has been shown to affect changes in public knowledge, attitudes, and behaviors related to nutrition and other health issues.[15,16]

The weakness of this study is that the research sample is still limited to one region, so generalization of results needs to be done with follow-up research on a wider population. There is no long-term measurement to see the effectiveness of LeB3E in maintaining changes in attitudes and actions of pregnant women.

The practical implication of this study is that LeB3E has the potential to be adopted in various health facilities as a more interactive and effective educational medium. This media can be integrated in midwifery training programs to improve their skills in providing education to pregnant women.

CONCLUSION

This study confirms that LeB3E is a very useful educational medium in improving pregnant women's understanding of infectious disease prevention. The results of the study show that the use of LeB3E can significantly increase the awareness and knowledge of pregnant women, so that it has the potential to be applied more widely in maternal and child health education programs.

LeB3E has great potential to be used as a national educational medium in efforts to prevent infectious diseases. Therefore, it is recommended that the implementation of LeB3E be expanded to various regions with the support of health workers and related institutions. The use of simpler and easier to understand language also needs to be considered so that educational materials can be accessed by more pregnant women. Further research directions to support the effectiveness of LeB3E more comprehensively, further research is recommended to evaluate the application of this medium in pregnant women populations in remote areas. In addition, further analysis is needed on the long-term impact of LeB3E use on changes in the behavior of pregnant women in the prevention of infectious diseases.

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