







# Effectiveness of an Interactive Educational Video on Exclusive Breastfeeding Knowledge Among Pregnant Women in Indonesia: A Quasi-Experimental Study

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## Abstract

**Background:**This study aimed to evaluate the effect of educational video interventions on pregnant women's knowledge of exclusive breastfeeding, using two comparison groups. Although digital learning media have become widely implemented in maternal health promotion, passive video delivery often limits comprehension and learning retention. Integrating interaction within digital education may enhance understanding by enabling clarification and strengthening information processing.

**Methods:** A quasi-experimental pretest–posttest design was conducted involving 34 pregnant women divided into two groups: an intervention group receiving an educational video with interactive discussion (n = 17) and a comparison group receiving the same video without interaction (n = 17). Knowledge was measured before and after the intervention and analyzed using the Wilcoxon Signed-Rank Test and Mann–Whitney Test.

**Result:** Results showed that both groups increased their posttest knowledge scores; however, improvement was greater in the interaction group. The Wilcoxon analysis demonstrated significant knowledge gains in the interactive group ( $Z = -3.643$ ;  $p = 0.000$ ). Meanwhile, the Mann–Whitney analysis indicated that the improvement in knowledge between the two groups was significantly different, favoring the interaction approach. These findings demonstrate that educational videos accompanied by interaction are more effective in improving maternal knowledge compared to passive video delivery.

**Conclusion:** Strengthening interaction-based digital health education is recommended to support maternal and child health programs.

## Keywords:

Exclusive breastfeeding, Maternal knowledge, Video Education

## BACKGROUND

Exclusive breastfeeding is recognized as a fundamental public health strategy that contributes significantly to infant survival, optimal growth, and strengthened immune function. The World Health Organization and Scoping review by Gyamfi recommends exclusive breastfeeding for the first 6 months of life to meet nutritional needs and protect against infectious diseases.(1, 2) However, Indonesia continues to face challenges in achieving optimal coverage. According to national health statistics, exclusive breastfeeding rates remain below national targets and vary widely across regions, influenced by maternal knowledge, accessibility, and support for health promotion.(3, 4)

One of the main factors influencing breastfeeding success is the level of maternal knowledge during pregnancy.(5-8) Mothers with limited understanding of breastfeeding benefits, initiation procedures, and proper feeding techniques are more likely to introduce formula or complementary feeding earlier than recommended. Therefore, strengthening health education during pregnancy is essential to improve exclusive breastfeeding practices.(9-11)

Digital media have increasingly been used in maternal health promotion, including educational video interventions. Videos provide visual guidance, consistent messaging, and high accessibility. However, many educational programs rely on passive video delivery, in which information flows in only one direction without opportunities for clarification.(11-17) This approach may limit cognitive processing, understanding, and message retention. Adding structured interaction, such as guided discussions or question answer sessions, is believed to improve learning outcomes by promoting deeper engagement, active participation, and correction of misconceptions.

Several previous studies have reported that interactive digital learning methods are more effective in improving knowledge and behavior change than passive learning approaches. Zingg and Tavleen reported that interactive learning increased maternal health literacy and led to more meaningful educational experiences.(18) Based on the above considerations, this study aims to analyze the effect of interactive educational video interventions on improving the knowledge of pregnant women regarding exclusive breastfeeding. By comparing two groups, one receiving an educational video with interaction and one without, this study seeks to determine whether interactive approaches are more effective in strengthening maternal understanding. The expected solution is that incorporating structured interaction within digital maternal education programs may help address the knowledge gap that contributes to low exclusive breastfeeding coverage in Indonesia.

## METHODS

### *Study Design and Setting*

This study employed a quasi-experimental two group with pretest–posttest design.

### *Population and Sampling*

The study involved 34 pregnant women selected using purposive sampling. Participants were divided into two groups: 1. Interactive group (n = 17): received an educational video followed by an interactive discussion, 2. Non-interactive group (n = 17): received the same educational video without interaction. Total sampling in research

### *Protocol Intervention*

Both groups watched a standardized educational video on exclusive breastfeeding. The interactive group received additional explanation and a question–and–answer session immediately after viewing the video. The non-interactive group watched the video without further discussion. Data analysis used non-parametric tests, with statistical significance set at  $p < 0.05$ .

### **Ethical Approval**

Before data collection, ethical clearance was secured from institutional research Ethics Committee at Sekolah Tinggi Ilmu Kesehatan (Approval Number: RK.194/KEPK/STIK/VI/2025). The study procedures adhered to the ethical standards outlined in the Declaration of Helsinki. All participants received a clear explanation of the study's objectives, were informed that their participation was entirely voluntary, and were assured of their right to withdraw at any point without any adverse consequences.

## **RESULT AND DISCUSSION**

### **Demographic Characteristics**

**Table 1.** Demographic Characteristics (n =34)

Variable	Non-Interactive Video Group		Interactive Video Group	
	n	%	n	%
<b>Age</b>				
< 35 years	12	70.6	13	76.5
≥ 35 years	5	29.4	4	23.5
<b>Education</b>				
Elementary School	4	23.5	2	11.8
Junior High School	2	11.8	1	5.9
Senior High School	8	47.1	6	35.3
Diploma/Bachelor Degree	3	17.6	8	47.1
Master Degree	0	0	0	0
<b>Occupation</b>				
Housewife	16	94.1	15	88.2
Trader/Farmer/Private Worker	0	0	1	5.9
Civil Servant/Teacher	1	5.9	1	5.9

Table 1 presents the characteristics of respondents in both groups. Most participants in the non-interactive and interactive groups were aged < 35 years (70.6% and 76.5%, respectively). Educational backgrounds varied across groups, with senior high school being the most common level in the non-interactive group (47.1%), while nearly half of the interactive group had a diploma or a bachelor's degree (47.1%). The majority of respondents in both groups were housewives, accounting for 94.1% in the non-interactive group and 88.2% in the interactive group. Only a small proportion were employed as traders, farmers, private workers, or civil servants. Overall, the distribution of demographic characteristics between the two groups was relatively comparable.

**Table 2.** Knowledge Levels in Pretest and Posttest by Group

Group	Knowledge Level	Pretest n (%)	Posttest n (%)
Interactive Video (n = 17)	Poor	9 (52.9)	0 (0.0)
	Adequate	8 (47.1)	17 (100.0)
Non-Interactive Video (n = 17)	Poor	14 (82.4)	5 (29.4)
	Adequate	3 (17.6)	12 (70.6)

In the pretest, more than half of the respondents in the interactive group had poor knowledge (52.9%), while 47.1% demonstrated adequate knowledge. In comparison, the non-interactive group showed a higher proportion of poor knowledge (82.4%), and only 17.6% had adequate knowledge. In

the posttest, all respondents in the interactive group achieved adequate knowledge (100%). Meanwhile, in the non-interactive group, 70.6% reached adequate knowledge, and 29.4% remained at the poor knowledge level.

**Table 3.** Summary of Wilcoxon and Mann–Whitney Test Results for Knowledge Scores

Analysis	Group / Comparison	Negative Ranks (n)	Positive Ranks (n)	Ties (n)	Z Value	p-Value
Wilcoxon Signed Rank Test (Within Group)	Non-Interactive Video	0	17	0	-3.638	0,000
	Interactive Video	0	17	0	-3.643	0,000
Mann–Whitney U Test (Between Groups)	Non-Interactive vs. Interactive	–	–	–	-3.920	0,000

*Note: Mann-Whitney, Wilcoxon/P<0,00*

Wilcoxon Signed Rank Test showed a significant increase in knowledge scores in both groups after the intervention. In the non-interactive video group, all respondents demonstrated improved scores, with no negative ranks and a Z value of  $-3.638$  ( $p = 0.000$ ). A similar pattern was observed in the interactive group, in which all participants showed increased posttest scores, as indicated by a Z value of  $-3.643$  ( $p = 0.000$ ). These findings confirm that both educational video interventions effectively enhanced knowledge levels within each group.

Furthermore, the Mann–Whitney U Test revealed a significant difference in knowledge improvement between the two groups ( $Z = -3.920$ ;  $p = 0.000$ ). The interactive video group achieved a greater level of improvement compared to the non-interactive group, indicating that the addition of interaction during the educational session was more effective in enhancing knowledge outcomes.

## DISCUSSION

The findings of study demonstrate that both non-interactive and interactive educational videos significantly improved respondents' knowledge. Based on the Wilcoxon Signed Rank Test results, all participants in both groups experienced an increase in posttest scores ( $p = 0.000$ ). This indicates that audiovisual media are an effective tool for health education. Using video integrates visual and auditory stimuli, enhancing attention, comprehension, and memory retention. According to the Cognitive Theory of Multimedia Learning proposed by Richard E. Mayer, learning becomes more meaningful when information is delivered through both visual and verbal channels rather than through a single modality.(19) The combination of images, narration, and movement in videos enables individuals to process information more deeply, leading to improved knowledge outcomes.

The improvement observed in both groups is consistent with previous empirical findings. Galmarini reported that video-based health education significantly increased knowledge retention compared to traditional printed materials.(20) Similarly, Morgado found that audiovisual learning improved cognitive engagement and understanding in health education settings.(21) In the Indonesian context, Ririnisahawaitun demonstrated that audiovisual media effectively enhanced community health knowledge scores after intervention. (22) These findings support the present study's result that even non-interactive video interventions can substantially improve participants' knowledge.

However, although both interventions were effective, the Mann–Whitney U Test revealed a statistically significant difference in knowledge improvement between groups ( $p = 0.000$ ), with the interactive video group achieving greater gains. This suggests that adding interaction during video-based education enhances learning effectiveness. Interactive sessions provide opportunities for clarification, discussion, and reinforcement of key messages, thereby strengthening understanding and

reducing misconceptions. This finding aligns with constructivist learning principles introduced by Jean Piaget, who emphasized that knowledge is actively constructed through engagement and experience rather than passively received. (23)

Respondents' demographic characteristics may have influenced the outcomes. Most participants were under 35 years old and predominantly housewives. Younger individuals tend to be more receptive to digital and audiovisual learning media, as reported by Stoumpos, who observed higher engagement levels with digital health education among younger adults. (24) Additionally, nearly half of the interactive group held a diploma or bachelor's degree, which may have facilitated better comprehension of the educational content. However, the fact that all participants in the interactive group achieved adequate posttest knowledge suggests that interactive methods are effective across diverse educational backgrounds. This aligns with Eden's findings, which concluded that interactive audiovisual interventions significantly improve knowledge regardless of baseline educational level. (25).

Overall, the results reinforce the growing evidence that audiovisual education is an effective strategy for improving knowledge and that incorporating interactive components further enhances its impact. Although passive video viewing can increase understanding, interactive engagement appears to maximize cognitive processing, attention, and information retention.

## **CONCLUSION**

Both educational video interventions significantly improved pregnant women's knowledge of exclusive breastfeeding. The non-interactive video intervention yielded a significant increase in knowledge (Wilcoxon  $p = 0.005$ ), while the interactive video intervention produced a highly significant and consistent improvement across all participants (Wilcoxon  $p = 0.000$ ). Additionally, the difference in knowledge gains between the two groups was statistically significant (Mann-Whitney  $p = 0.000$ ), demonstrating the superior effectiveness of the interactive method. These results indicate that interaction through explanation, dialogue, and opportunities for clarification substantially enhances comprehension, especially among women with lower levels of education and those residing in rural areas. Therefore, incorporating interactive elements into digital maternal health education is crucial to promote equitable knowledge acquisition and support informed exclusive breastfeeding practices.

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## **AUTHOR'S CONTRIBUTION STATEMENT**

ATW, AA & NUM: Conceptualization, Methodology, Formal Analysis, Writing-Original Draft, Review. Y, FPI & S : Inverstigation. All author approved the final article to be published.

## **CONFLICT OF INTEREST**

No. conflict of interest to declare in study

## **DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS**

Nothing to declare

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