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Empowerment of health cadres through digital education to enhance knowledge, attitudes, self-efficacy, and behavior of exclusive breastfeeding mothers

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Abstract: Digital transformation is needed for mothers to utilize the importance of exclusive breastfeeding by empowering the role of cadres in it. This study aims to examine the effectiveness of empowering health cadres through digital education using website-based digital education media called Halo_ASIEK to improve the knowledge, attitudes, self-efficacy, and behaviors of exclusive breastfeeding mothers through ADDIE Model (Analyze, Development, Design, Implementation and Evaluation). ADDIE Model is necessary to conduct a product development analysis so that it can reach the intended purpose. The education were delivered by the health cadres to mothers with Trainers on Trainers (TOT) approach. Based on the analysis carried above, the digital education was needed. The quantitative data analysis on the knowledge showed that there is an improvement. The mother's attitude also became more positive, with a significance of 0.000 (<0.05). Based on univariate analysis, it was also found that there was a change in the mother's self-efficacy regarding her ability to provide exclusive breastfeeding, it is increased by 45.5% with a significance of 0.000 (<0.05). It was also found that digital education has a significant effect on the mother's behaviours with significance (0.000 <0.05). It can be concluded that digital education has significant positive impacts on knowledges, attitudes, self efficacy and behaviours on breastfeeding mothers.

Keywords: *Breastfeeding, Community health workers (Caders), Digital Education.*

1. Introduction

Exclusive breastfeeding is when an infant receives only breast milk, no other liquids or solids are given – not even water, with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines Exclusive breastfeeding offers various health benefits, including a reduced risk of infections, enhanced immune system, and optimal cognitive development in children [1]. The rate of exclusive breastfeeding remains low in several countries, including Indonesia. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months due to its significant benefits for both infants and mothers. However, the rate of exclusive breastfeeding in Indonesia remains below the national target [2]

The low breasfeeding rate in Indonesia are caused by limited knowledges regarding the benefit of exclusive breastfeeding and their negative attitudes and behaviors towards it, and low self-efficacy [3]. There is a significant relationship between the level of mother's knowledge about breast milk and the provision of exclusive breastfeeding [4]. It can increase self-awareness which then creates interest or a positive attitude and is then followed by a commitment to change with ongoing support from significant others, so the mothers are able to adopt new positive behavior. The breastfeeding process does not always go smoothly because breastfeeding is not something that happens by itself, but is a skill that needs to be taught and prepared since pregnancy [5]. Low breastfeeding is caused

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by mothers not knowing and understanding the correct breastfeeding procedures, such as the importance of giving breast milk, how breast milk comes out, how to position the baby during the breastfeeding, how to make the babies latch onto their breasts, and also the options when the mothers can't give their breasts milk when they separated from their babies. Based on that, it is needed to be prepared by increasing knowledge, skills and their readiness to go thorugh the breastfeeding process later on [6]. This breastfeeding knowledge can be obtained through education by the health cadres durin their third trimester in order for them to know the benefits of breast milk so that the pregnant women can be more prepared, by having enough knowledges and self-efficacy even before their babies arrived [7]. Mothers with high self-efficacy tend to have successful exclusive breastfeeding than mothers who are not.

BSE (Breasfeeding Self Efficacy) is one of the psychological factors and motivational factors in the beginning, success, and duration of breastfeeding carried out by mothers. Self efficacy in mothers can be a prediction of whether the mother chooses to breastfeed her baby or not (their behaviors), seeing and knowing how much effort the mother makes to provide breast milk to her baby, the mother's mindset in breastfeeding her baby, making improvements or even giving up, and how the mother can respond emotionally when facing difficulties and obstacles in her efforts to breastfeed [8].

In order to improve the exclusive breastfeeding rate in Indonesia, we need to include the health cadres in it [9]. Indonesian's health cadres are community volunteers who have been trained by healthcare professionals to operate and aid in health promotion programs run by the Public Health Center called (Puskesmas). They work at the local level and have easier access to mothers. They serve as a effective link between healthcare providers and the community.

Empowering health cadres as frontline educators for breastfeeding mothers can be one of the strategy to enchance the rate of exclusive breastfeeding in Indonesia. Trained health cadres can provide information, support, and motivation for mothers to practice exclusive breastfeeding because they play a crucial role in providing the support and information needed [10]. However, there are several challenges to achieve it.

In this digital era, health cadres empowerment program can be more effective and easier to reach [11] Digital education involves the use of digital technologies, such as mobile applications, online platforms, social medias, and interactive digital content, to convey information and education to breastfeeding mothers. Through digital education, health cadres can provide easier and more flexible access for breastfeeding mothers to obtain accurate and up-to-date information [12]. By leveraging digital technology, health cadres can become effective change agents in strengthening exclusive breastfeeding practices within the community [3].

However, further research is needed to examine the impact of empowering health cadres through digital education on improve the knowledge, attitudes, self-efficacy, and behaviors of breastfeeding mothers regarding breastfeeding practices. This study aims to examine the effectiveness of empowering health cadres through digital education using website-based digital education media called Halo_ASIEK to improve the knowledge, attitudes, self-efficacy, and behaviors of exclusive breastfeeding mothers through ADDIE Model (Analyze, Development, Design, Implementation and Evaluation) by using TOT (Trainers on Trainers) on health cadres.

1.1. This Study Offers Several Key Novelties

1. The development of digital education platform called Hallo_ASIEK which can be used to educate mothers about breastfeeding
2. The use of ADDIE model in which this study used the Analyze, Design, and Developments phases to develop the digital education platform called Hallo_ASIEK with Trainers on Trainers (TOT) approach by optimizing the health cader's roles to give education to mothers

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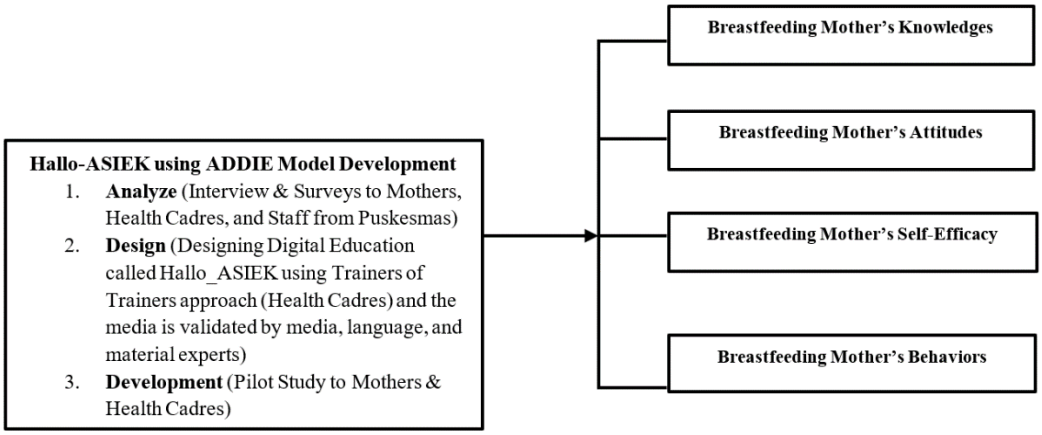


Figure 1.
Conceptual framework.

2. Method

This research is using the R & D (Research and Development) design of the ADDIE model with Trainers on Trainers (Health Cadres) approach. The steps used in this research including Analyze, Design, and Development Stafes. The ADDIE model was chosen because this model describes a systematic approach to instructional development that is appropriate for the software to be used in this study. When used in developmentthis ADDIE model is sequential and interactive, in addition, each evaluation result of each stage can bring learning development to the next stage.

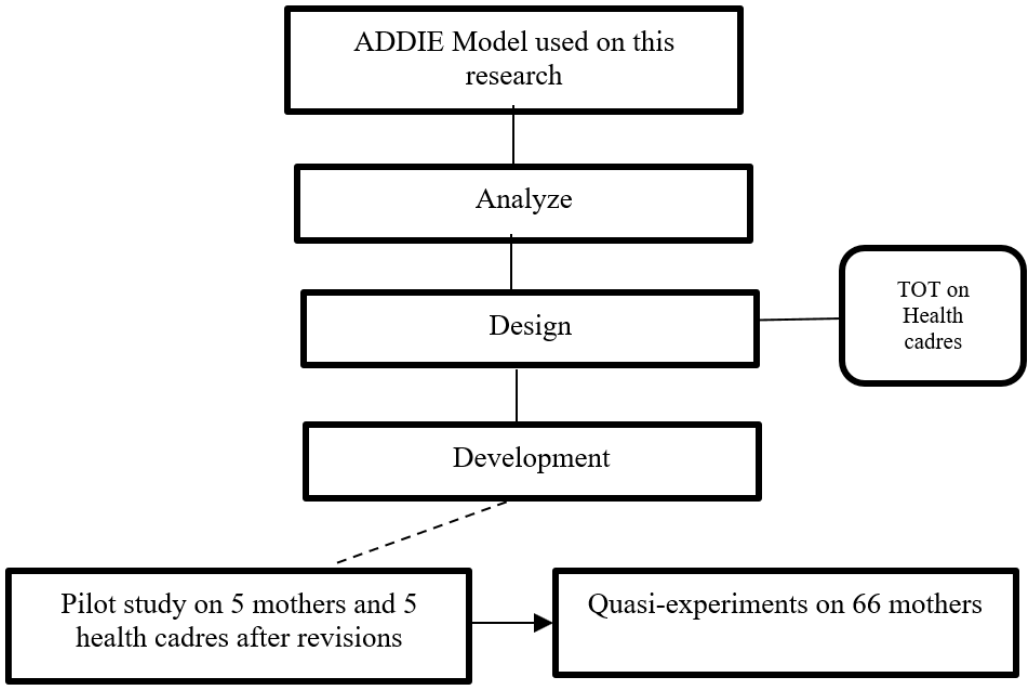


Figure 2.
ADDIE Model.

The population in this study were pregnant women in the third trimester in Boyolali region, Central Java, Indonesia.

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The inclusion criteria for this study were based on age, education, occupation and parities:

1) Age 20-30 years
2) Minimum high school education
3) Working/unemployed
4) Pregnant women in the third trimester
5) Pregnant with their first child
6) Able to operate an android/smartphone

The sampling technique used in this study is non-probability sampling. More specifically, the study used a purposive sampling technique, which is a technique for determining respondents to be used as samples based on certain criteria. First stage is selecting cadres from the sampling unit and the second stage is selecting breastfeeding mothers from the the cluster that has been determined in the first stage. The sample size for each digital education group and non-digital group is as 33 in each sample group, and the total sample is 66 pregnant women.

3. Result and Discussion

3.1. ADDIE Model

3.1.1. Analyze

The analyze step including conducting interviews from 3 health cadres in Boyolali and one staff from Govement called DKK Boyolali. They conveyed that the education program carried out by the cadres had not been implemented optimally and routinely in this area. Based on the interview from them, it is concluded that there are indeed problems that prevent mothers from utilizing their exclusive breastfeeding because of works reasons, lack of knowledge about the importance of exclusive breastfeeding, lack of knowledge about the dangers of early feeding, lack of motivation in mothers to attend programs that have been planned, low self-efficacy when breast milk does not come out optimally, efforts to overcome it, and the need for programs that make it easier for mothers that can be accessed anytime and anywhere because of the risk of mothers who like not to come when counseling is carried out.

Therefore, it can be said digital education solution is needed as an alternative in exclusive breastfeeding education to make it easier for mothers to access information about exclusive breastfeeding since the reasons for the impending exclusive breastfeeding mainly comes from works reasons, lack of knowledge about the importance of exclusive breastfeeding, lack of knowledge about the dangers of early feeding, lack of motivation in mothers to attend programs that have been planned, low self-efficacy when breast milk does not come out optimally, efforts to overcome it, and the need for programs that make it easier for mothers that can be accessed anytime

The smartphone users in Indonesia reached 89%, which is around 167 million people from the total population of Indonesia. Based on a survey conducted by the Indonesian Internet Service Users Association (APJII) in 2018, it showed that mobile phone users in Indonesia were 355 million, and the number of internet users was 171 million people. So that education through digital that can be accessed by mothers anywhere and anytime especially for mothers who can't follow the program optimally because of work, inappropriate schedules, and various other obstacles. In addition, this program also wants to support the role of cadres in providing digital education, so that all parties can be maximally involved (engage). To support this program, it is necessary to have a systematic training/ education about the Halo_ASIEK software. The training will be given by the health cadres to mothers.

Regarding what materials should be included in the digital education program, in addition to interviews with the four informants above, the researcher also distributed a survey/questionnaire via google form to 5 cadres from Puskesmas Klego and 10 respondents from pregnant women in their third trimester. From the 11 alternative choices of materials that should be included, the most needed material in digital education is about the Definition of Exclusive Breastfeeding (7.5%), Benefits of

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Exclusive Breastfeeding (18.1%), How to Breastfeed Properly (13.5%), How Babies Respond to Sufficient Breastfeeding (11%), How to Breastfeed Even While Having to Work (13.8%), How to Prevent Nipple Pain While Breastfeeding (12.5%), Correct Frequency of Breastfeeding (8.1%), Duration of Exclusive Breastfeeding (8%). Meanwhile, the lowest and not too significant need to be included in the material is about Obstacles for Breastfeeding Mothers (4%), Negative Impacts of Not Giving Exclusive Breastfeeding (1%) and the Role of Husbands in Supporting Breastfeeding Mothers (2.5%).

3.1.2. Design

3.1.2.1. The Module Creation

The module contains specific instructional objectives, legal basis for exclusive breastfeeding, and legal basis for health empowerment. Introduction (background, objectives, benefits, and systematics of the module), digital education materials, digital education methods, evaluation and monitoring, and closing program.

3.1.2.2. Preparation of Website Materials

Based on a previous survey of 5 health cadres and 10 pregnant women in their third trimester regarding what should be included in digital education materials, the material topics will cover the definition of exclusive breastfeeding. benefits of exclusive breastfeeding. how to breastfeed properly, how babies respond to sufficient breastfeeding (11%), how to breastfeed even while having to work. how to prevent nipple pain while breastfeeding, correct frequency of breastfeeding and duration of exclusive breastfeeding.

3.1.2.3. Creation of the Hallo_ASIEK Website Digital Platform

"Hallo_ASIEK" was an education website based program. The materials provided are in the form of writing, interactive messages and videos contained on the website. The concept of digital education is made in the form of a website that can be accessed and users can then create an account and log in at any time to then access the website.

3.1.2.4. Preparation for Experts Validatity

The material expert validator in this study was Dr. Hari Wahyu Nugraha, Sp.A (K) as a Child Health Expert who plays a role in providing in-depth knowledge and experience about infant health related to exclusive breastfeeding practices, as well as providing clinical guidance and the latest information in compiling the module. and Dr. Ida Untari, SKM., M.Kes as a Public Health Consultant (Dean of FST & Lecturer at ITS PKU) plays a role in providing perspective and experience in implementing public health programs related to exclusive breastfeeding practices. Providing advice on program implementation and monitoring strategies, and Furi Nayu Oktaviyani, S.Gizi. As the PKM Section (DKK Boyolali), plays a role in providing input based on direct experience in empowering health cadres in the field, as well as providing insight into the challenges and needs of health cadres in supporting exclusive breastfeeding practices.

Media validation was carried out by Hery Siswanto.S.Kom., M.Kom as a Consultant/Expert in Education and Technology (IT Consultant/IT Lecturer ITS PKU Muhammadiyah Surakarta), playing a role in providing guidance and knowledge on the use of digital technology in education, as well as developing effective learning strategies using digital media, videos, animations, and images. While the language expert was validated by Dr. Muhlis Fajar Wicaksono,,M.Pd as Editor (Indonesian Language Lecturer), who is responsible for editing and perfecting the module as a whole, as well as ensuring consistency, clarity, and quality of language in the module.

3.1.2.5. Designing Trainers on Trainers Approach/Model

Since this research wanted to utilizing Health Cadres Role because they are closer to expectant mothers, the Training of Trainers (TOT) is used in this approach. TOT is a training process that aims

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to improve the capacity of individuals (in this case health cadres) to be able to become facilitators or trainers for other target groups (expecting mothers). The TOT model is not only focuses on improving knowledge, but also communication skills, information delivery methods, and effective facilitation strategies. This training is designed so that participants (potential trainers) are not only able to master the material, but also have pedagogical and andragogical skills in transferring knowledge to the wider community in a participatory and sustainable manner. As was done in this study, where cadres were trained to then be able to transfer knowledge to mothers with digital education.

3.1.2.6. Preparing Pilot Study

The pilot study is conducted to 5 cadres from Puskemas Klego 2 and 5 pregnant women in the third trimester of Puskemas Klego 2. The questionnaire was compiled with a Likert scale consisting of aspects of material, language, and media.

3.1.3. Development

3.1.3.1. Hallo_ASIEK Website

This stage is the product relase, namely the Hallo_ASIEK website which is used as a digital education media by Health cadres which will later be presented to pregnant women in the third trimester (Trainers on Trainers).

3.1.3.2. Expert Validation

3.1.3.2.1. Material & Languange Validation

This material validation is carried out to see the suitability of the material contained in the Halo_ASIEK website. This material dan language validation is carried out in the form of a questionnaire with a Likert scale. The expert validators of the material and language in this study were Dr. Hari Wahyu Nugraha, Sp. A (K) as a Child Health Expert (Validator 1), Dr. Ida Untari, SKM., M. Kes as a Public Health Consultant (Validator 2), and Furi Nayu Oktaviyani, S. Gizi. As Sie PKM (DKK Boyolali) (Validator 3)

Based on the results of the validation of the material and language experts above, the material on the website was then revised for language use, especially for terms that can be accepted by common people with various backgrounds, educational backgrounds, and socio-economics.

3.1.3.2.2. Media Validation

Media validation was carried out to see the suitability of the digital educational media used. Media validation was carried out by Siswanto [13] as a Consultant/Expert in Education and Technology (IT Consultant/IT Lecturer at ITS PKU Muhammadiyah Surakarta), playing a role in providing guidance and knowledge about the use of digital technology in education, as well as developing effective learning strategies using digital media, videos, animations, and images. Based on the results of the media expert validation, improvements were made to the video and animation so that the video is more interactive, interesting, and has a coherent flow so that it is easy for users to understand.

3.1.3.3. Pilot Study

This stage includes a trial of the Halo ASIEK product or website. The results of the first and second stage product trials were obtained from the results of questionnaires filled out by cadres and pregnant women. In the pilot study, it was tested on 5 cadres from Puskemas Klego 2 and 5 pregnant women in the third trimester of Puskemas Klego 2. The questionnaire was compiled with a Likert scale consisting of aspects of material, language, and media. For health cadres there are 17 items, while for pregnant women in the third trimester there are 16 items. The number of responses from pregnant women in the third trimester with a small group reaching 82%. It can be concluded that digital educational products or media have been assessed well by pregnant women in the third trimester to support the success of Exclusive Breastfeeding.

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The next stage was carried out to explore more deeply the effectiveness of the role of cadres supported by digital education. This stage will discuss empowering cadres through digital education to improve knowledge, attitudes, self-efficacy, and behavior of breastfeeding mothers in the practice of exclusive breastfeeding. The research participants were mothers in their third trimester and health cadres in several health centers in Boyolali Regency using pretest-postest experiment-controlled group.

The number of health cadres was 12 people from 12 sub-districts in Boyolali. The health cadres had previously been given training on providing exclusive breastfeeding and how to use digital educational media based on a website called "Halo_ASIEK". After these 12 health cadres had understood the use of this website, these cadres then provided education to 66 pregnant women in their third trimester from 12 sub-districts in Boyolali (33 for experiment group and 33 for controlled group).

This research run for 6 months until the mother finally gives birth and has a baby aged 0-6 months. This study is a two-group pretest-posttest, so there are 33 people in each control group and experimental group. The experimental group was given digital education, while the control group was given education through leaflets (non-digital). Furthermore, the measurement of knowledge, attitudes, self-efficacy, and behavior of breastfeeding mothers was carried out before and after the intervention using a scale prepared by the researcher which tested with realibility, validatity and expert judgements (6 experts).

4. Results

4.1. The Effects of Digital Education on Mother's Knowledges

Table 1.
Pre-Test and Post Test.

		N	Mean Rank	Sum of Ranks
	Negative Ranks	1[a]	7.00	7.00
	Positive Ranks	19[b]	10.68	203.00
	Ties	13[c]		
	Total	33		

Table 2.
The Effects of Digital Education on Mother's Knowledges.

Test Statistics[a]	
	Knowledge Results
Mann-Whitney U	100.500
Wilcoxon W	661.500
Z	-5.728
Asymp. Sig. (2-tailed)	0.001

Note: a. Grouping Variable: Kelas.

As the tables above indicates, there is a significant change in the level of knowledge before and after receiving digital education from the health cadres. This is shown by the statistical analysis using the Mann Whitney Test since the data is not normal. The result showed the signifance of 0.000 < 0.05. Therefore, it is indicated that there is an effect of the digital education model on mothers' knowledge regarding exclusive breastfeeding, where health cadres providing education through digital methods play a significant role in enhancing knowledge about exclusive breastfeeding. According to the ranking table, it is also apparent that the number of positive ranks after receiving digital education from the cadres (19) is greater than the number of negative ranks (13), with ties amounting to 13.

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4.2. The Effects of Digital Education on Mother's Attitudes

Table 3.
Pre-Test and Post Test.

Pre-test			
Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
29	87.9	87.9	87.9
4	12.1	12.1	100.0
33	100.0	100.0	
Post-test			
Frequency	Percent	Valid Percent	Cumulative Percent
10	30.3	30.3	30.3
23	69.7	69.7	100.0
33	100.0	100.0	

Table 4.
The Effects of Digital Education on Mother's Attitudes.

Test Statistics[b]	
	POSTSIKAP - PRESIKAP
Z	-3.962[a]
Asymp. Sig. (2-tailed)	0.000

Note: a. Based on negative ranks.
b. Wilcoxon Signed Ranks Test.

As the table above indicates, there is a significant change in mothers' attitudes before and after receiving digital education from the health cadres. Initially, the majority of mothers held negative attitudes toward exclusive breastfeeding; however, after receiving digital education from the cadres regarding exclusive breastfeeding, their attitudes became positive. The positive attitude increased by 57.6% after pregnant mothers received education from the cadres about exclusive breastfeeding. According to the statistical table, the significance is 0.000 ($p < 0.05$), indicating that there is an effect of digital education on pregnant mothers' attitudes regarding exclusive breastfeeding, where the cadres providing digital education play a significant role in enhancing mothers' positive attitudes toward exclusive breastfeeding.

4.3. The Effects of Digital Education on Mother's Self Efficacy

Table 5.
Pre-Test and Post Test.

Pre-Test					
		Frequency	**Percent**	**Valid Percent**	**Cumulative[b] Percent**
Valid	Not enough	14	42.4	42.4	42.4
	Enough	15	45.5	45.5	87.9
	Good	4	12.1	12.1	100.0
	Total	33	100.0	100.0	
Post-Test					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not enough	4	6.1	6.1	6.1
	Enough	12	36.4	36.4	42.4
	Good	17	57.6	57.6	100.0
	Total	33	100.0	100.0	

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Table 6.
The Effects of Digital Education on Mother's Self Efficacy.

Test Statistics[a]	
	Post_Self Efficacy - Pre_Efficacy
Z	-3.045[b]
Asymp. Sig. (2-tailed)	0.001

Based on the univariate analysis in the table above, there is a change in mothers' self-efficacy regarding their ability to provide exclusive breastfeeding. Initially, the majority of mothers had a self-efficacy level that was adequate; however, after receiving treatment from the health cadres through digital education about exclusive breastfeeding, their self-efficacy improved. This good enough self-efficacy increased on level 57,6% after mothers received education from the cadres regarding exclusive breastfeeding. Referring to the statistical table above, a significance of 0.000 (p value < 0.05) was obtained, indicating that digital education affects mothers' self-efficacy in providing exclusive breastfeeding, where the cadres play a significant role in enhancing mothers' efficacy that they are capable of providing exclusive breastfeeding to their infants through digital education.

4.4. The Effects of Digital Education on Mother's Behaviors

Table 7.
Pre-Test and Post Test

		N	**Mean Rank**	**Sum of Ranks**
Post-Behavior	-Negative Ranks	15[a]	8.00	120.00
Pre-Behavior	Positive Ranks	18[b]		
	Ties	0[c]	0.00	0.00
	Total	33		

Table 8.
The Effects of Digital Education on Mother's Behaviors.

Test Statistics[a]	
	Behavior
Mann-Whitney U	377,000
Wilcoxon W	938,000
Z	-2,156
Asymp. Sig. (2-tailed)	,031

Note: a. Grouping Variable: Kelas.

Based on the results in the table above, it can be seen that there was a significant change in the level of behavior between before and after receiving digital education from cadres. This can be seen from the results of the statistical analysis using the Mann Whitney test, which obtained a p value for maternal behavior of 0.031 <0.05. Thus theres is an influence/effect of digital education on maternal behavior towards exclusive breastfeeding, where cadres who provide digital education have a significant role in increasing the positive behaviors of mothers towards exclusive breastfeeding.

4.5. The Effects of Digital Education on Mother's Knowledges

Table 9.
Pre-Test and Post Test.

		N	**Mean Rank**	**Sum of Ranks**
Post Knowledge - Pre Knowledge	Negative Ranks	1[a]	7.00	7.00
	Positive Ranks	19[b]	10.68	203.00
	Ties	13[c]		
	Total	33		

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Table 10.
The Effects of Digital Education on Mother's Knowledges.

Test Statistics[a]	
	Knowledge Results
Mann-Whitney U	100.500
Wilcoxon W	661.500
Z	-5.728
Asymp. Sig. (2-tailed)	0.001

Note: a. Grouping Variable: Kelas.

As the tables above indicates, there is a significant change in the level of knowledge before and after receiving digital education from the health cadres. This is shown by the statistical analysis using the Mann Whitney Test since the data is not normal. The result showed the signifance of 0.000 < 0.05. Therefore, it is indicated that there is an effect of the digital education model on mothers' knowledge regarding exclusive breastfeeding, where health cadres providing education through digital methods play a significant role in enhancing knowledge about exclusive breastfeeding. According to the ranking table, it is also apparent that the number of positive ranks after receiving digital education from the cadres (19) is greater than the number of negative ranks (13), with ties amounting to 13.

4.6. The Effects of Digital Education on Mother's Attitudes

Table 11.
Pre-Test and Post Test.

Pre-test			
Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
29	87.9	87.9	87.9
4	12.1	12.1	100.0
33	100.0	100.0	
Post-test			
Frequency	Percent	Valid Percent	Cumulative Percent
10	30.3	30.3	30.3
23	69.7	69.7	100.0
33	100.0	100.0	

Table 12.
The Effects of Digital Education on Mother's Attitudes.

Test Statistics[b]	
	Postsikap - Presikap
Z	-3.962[a]
Asymp. Sig. (2-tailed)	0.000

Note: a. Based on negative ranks.
b. Wilcoxon Signed Ranks Test.

As the table above indicates, there is a significant change in mothers' attitudes before and after receiving digital education from the health cadres. Initially, the majority of mothers held negative attitudes toward exclusive breastfeeding; however, after receiving digital education from the cadres regarding exclusive breastfeeding, their attitudes became positive. The positive attitude increased by 57.6% after pregnant mothers received education from the cadres about exclusive breastfeeding. According to the statistical table, the significance is 0.000 ($p < 0.05$), indicating that there is an effect of digital education on pregnant mothers' attitudes regarding exclusive breastfeeding, where the cadres providing digital education play a significant role in enhancing mothers' positive attitudes toward exclusive breastfeeding.

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4.7. The Effects of Digital Education on Mother's Self Efficacy

Table 13.
Pre-Test and Post Test.

Pre-Test					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Kurang	14	42.4	42.4	42.4
	Cukup	15	45.5	45.5	87.9
	Baik	4	12.1	12.1	100.0
	Total	33	100.0	100.0	
Post-Test					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Kurang	4	6.1	6.1	6.1
	Cukup	12	36.4	36.4	42.4
	Baik	17	57.6	57.6	100.0
	Total	33	100.0	100.0	

Table 14.
The Effects of Digital Education on Mother's Self Efficacy.

Test Statistics[a]	
	Post_Self Efficacy - Pre_Efficacy
Z	-3.045[b]
Asymp. Sig. (2-tailed)	.001

Note: a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Based on the univariate analysis in the table above, there is a change in mothers' self-efficacy regarding their ability to provide exclusive breastfeeding. Initially, the majority of mothers had a self-efficacy level that was adequate; however, after receiving treatment from the health cadres through digital education about exclusive breastfeeding, their self-efficacy improved. This good enough self-efficacy increased on level 57,6% after mothers received education from the cadres regarding exclusive breastfeeding. Referring to the statistical table above, a significance of 0.000 (p value < 0.05) was obtained, indicating that digital education affects mothers' self-efficacy in providing exclusive breastfeeding, where the cadres play a significant role in enhancing mothers' efficacy that they are capable of providing exclusive breastfeeding to their infants through digital education.

4.8. The Effects of Digital Education on Mother's Behaviors

Table 15.
Pre-Test and Post Test.

		N	**Mean Rank**	**Sum of Ranks**
Post-Behavior	-Negative Ranks	15[a]	8.00	120.00
Pre-Behavior	Positive Ranks	18[b]		
	Ties	0[c]	0.00	0.00
	Total	33		

Table 16.
The Effects of Digital Education on Mother's Behaviors.

Test Statistics[a]	
	Behavior
Mann-Whitney U	377.000
Wilcoxon W	938.000
Z	-2.156
Asymp. Sig. (2-tailed)	0.031

Note: a. Grouping Variable: Kelas.

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Based on the results in the table above, it can be seen that there was a significant change in the level of behavior between before and after receiving digital education from cadres. This can be seen from the results of the statistical analysis using the Mann Whitney test, which obtained a p value for maternal behavior of 0.031 <0.05. Thus theres is an influence/effect of digital education on maternal behavior towards exclusive breastfeeding, where cadres who provide digital education have a significant role in increasing the positive behaviors of mothers towards exclusive breastfeeding. Based on the ranking table, it also appears that the number of positive ranks after receiving digital education from cadres (18) is greater than the negative ranks (15) and is balanced (ties) totaling 0.

5. Discussions

The results indicated a significant improvement in knowledge, attitudes, self-efficacy, and behaviors of breastfeeding mothers after participating in the digital education program. Mothers who received education through empowered health cadres demonstrated a better understanding of the benefits of exclusive breastfeeding, greater efficacy in breastfeeding, and more consistency in providing exclusive breastfeeding compared to the control group. The findings show a significant increase in knowledge, attitudes, self-efficacy, and behaviors of breastfeeding mothers in the intervention group compared to the control group.

Knowledge among mothers significantly increased after receiving digital education from the cadres. Descriptive analysis reveals that the majority of respondents have a high school education level. Education is necessary to facilitate mothers in receiving information. The higher the mother's education, the easier it is to receive information, leading to better knowledge about exclusive breastfeeding [5]. Although most mothers or respondents are high school graduates, a significant increase in knowledge occurred. This is attributed to the digital education provided by the cadres through a specially designed website for breastfeeding mothers, which facilitates a deeper understanding of exclusive breastfeeding. digital education is more effective in reaching the community, especially as nearly all segments of society now have access to mobile phones and the internet [14]. Almost all segments of society utilize advancements in information and communication technology, making education easier to deliver when conducted digitally. This digital education provides greater flexibility for mothers with geographical, time, or mobility constraints to access valuable information regarding exclusive breastfeeding. By providing information through digital media, individuals develop collaborative, communicative, independent, and disciplined skills, and also gain awareness of digital ethics. Mothers can also learn to become resilient and adaptive individuals in facing technological changes in the future.

In addition to knowledge, the digital education provided by the cadres also enhances mothers' positive attitudes toward exclusive breastfeeding. If mothers perceive that the outcomes of providing exclusive breastfeeding are positive, they will develop a positive attitude toward it. Individual perceptions are shaped by a frame of reference (knowledge from readings, education, research, etc.) and a frame of experiences (personal experiences) [15]. A person's perception is primarily influenced by the information or knowledge they acquire [16]. After receiving education or knowledge from the cadres, mothers' perceptions of exclusive breastfeeding, which were initially negative, became more positive. This positive perception subsequently fosters a positive attitude toward exclusive breastfeeding.

This positive attitude is further reinforced by self-efficacy and the mothers' attitudes related to the activity of providing exclusive breastfeeding. Self-efficacy relates to an individual's efficacy, in this case, breastfeeding mothers. Breastfeeding Self-Efficacy (BSE) refers to a mother's belief in her ability to breastfeed her baby and her expectations regarding whether she will choose to breastfeed, the effort required, her ability to improve, and how she emotionally responds to breastfeeding difficulties Breastfeeding self-efficacy (BSE) is a significant factor that influences and encourages mothers to breastfeed their infants, which indicate a relationship between breastfeeding self-efficacy and the provision of exclusive breastfeeding. One factor that promotes the emergence of BSE is verbal persuasion. Verbal persuasion refers to external encouragement or support from others who have a significant influence on the mother, such as husbands, friends, family, lactation consultants, and

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healthcare practitioners. Verbal persuasion serves as a positive reinforcement, enabling mothers to continue their exclusive breastfeeding responsibilities. This verbal persuasion can be conducted and is more effective when delivered digitally [17]

All of these factors can lead to positive behaviors in exclusively breastfeeding mothers/ When individuals receive and seek health information, it can enhance their knowledge about exclusive breastfeeding, thereby changing their behavior. Additionally, it is also driven by reinforcement factors, where, besides family, support from community leaders serves as a reinforcing factor for positive health behaviors, in this case, the cadres Education and promotion of exclusive breastfeeding provided by professional healthcare workers, such as the cadres in this study, become crucial factors in the success of exclusive breastfeeding programs. Support from cadres from pregnancy through to postpartum is more effective in achieving exclusive breastfeeding success. These findings align with previous research indicating that support and education from healthcare professionals can enhance mothers' compliance in providing exclusive breastfeeding [18].

Thus, it can be concluded that the digital education model implemented by the cadres is effective in enhancing mothers' knowledge, as digital education can be conducted flexibly without being constrained by time and place, making it more efficient and effective [19]. This also facilitates health cadres in continuously updating their knowledge and effectively supporting breastfeeding mothers. The efficient and effective dissemination of knowledge subsequently leads mothers to develop a positive perception of exclusive breastfeeding, which in turn fosters a positive attitude within them. This positive attitude will be further strengthened by Breastfeeding Self-Efficacy (BSE), which is the efficacy that they can fulfill their responsibilities in providing exclusive breastfeeding. This, in turn, encourages the emergence of exclusive breastfeeding behaviors among mothers.

6. Conclusion

Empowering health cadres through digital education by using ADDIE Model with TOT approach (by training health cadres) has proven effective in enhancing knowledge, attitudes, self-efficacy, and behaviors of breastfeeding mothers. Digital education allows information to be delivered in a more engaging and accessible method, facilitating more intensive interaction between health cadres and breastfeeding mothers. The implementation of digital education programs in community health centers can serve as a model that can be adopted by other regions to increase the rates of exclusive breastfeeding. This study recommends that the government and health organizations leverage digital technology in health education programs to improve exclusive breastfeeding rates in Indonesia. Digital education can be a powerful tool in community health empowerment initiatives.Future studies could explore longitudinal effects and cross-cultural comparisons to further enrich these insights.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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