International Journal of Nursing and Health Services (IJNHS)
http://ijnhs.net/index.php/ijnhs/home
Volume 3 Issue 5, October 20th 2020, pp 549-559
e-ISSN: 2654-6310

Mobile Information Breastfeeding Model (MIB-Model) On Behaviors and Self-Efficacy of Breastfeeding Among Mothers

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Article info

***Article history*:**
Received; July 15th, 2019
Revised: August 04th, 2019
Accepted: August 20th, 2019

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DOI:
http://doi.org.10.35654/ijnhs.v3i5.258

Abstract. Breastfeeding is proven to have long-term health benefits for both mothers and infants. The advancement of mobile technology is very useful in promoting health that can change health behaviors. The success of breast milk is not separated from the methods and media used. The study aimed to develop MIB-Model and to examine the effect of MIB-Model on behavior and self-efficacy of breastfeeding among mothers in providing breast milk. The application development method with the software development Live cycle (SDLC) with the waterfall model. The test model is conducted with Quasi-experiment with pre-test, post-test, and control group design. The number of respondents in this study amounted to 40 0rang, 20 for the experimental group, and 20 for the control group. MIB-Model proved its worth having performed with the ISO 9126 standard and can improve knowledge, attitudes, actions, and the baby's weight to the P-value <0.05. In unpaired data analysis, self-efficacy with P-value> 0.05 showed no differences between the intervention and control, support, and experience of being part of self-efficacy formation. MIB-Model is feasible to be utilized and improved primiparous breastfeeding mothers' behavior and the baby's weight and does not increase the self-efficacy mother.

Keyword: breastfeeding, behaviors, self-efficacy

INTRODUCTION

Maternal and Child Health (KIA) in Indonesian is still problematic. With the high mortality rate of mothers and infants, about 32,007/birth in 2016 (1). UNICEF stated that 30,000 infant deaths in Indonesia and 10 million infant deaths in the world could be prevented through exclusive breastfeeding for six months. The coverage of breast milk in Indonesia is still far from the National Development Program (PROPENAS), which is 80% in 2018, and the achievement is 45.0%. Some factors cause a stop to breastfeed both from health behaviors, social cultures (1).

Behavior is all activities or activities of the human being, either that can be observed directly, or that can not be observed from outside. Mothers' confidence in the ability to breastfeed because it is proven that Self-efficacy affects breastfeeding outcome. The Government's efforts are one of them by issuing a policy on breast milk. Self-efficacy is an individual's belief in something that has not been done and can increase motivation (2). Breastfeeding Self-efficacy is a belief owned by the mother in terms of breastfeeding to predict whether the mother will decide to breastfeed, amounting to what efforts are made to breastfeed, whether it has a mindset that builds or damages how to respond to various problems and difficulties during lactation. Previous studies showed that Breastfeeding self-efficacy was an important factor relating to the initiation, duration, and exclusivity of breastfeeding (3).

Disseminate knowledge of health education can be done in several ways, namely: education, training, counseling, consultation, and through the media. Among these methods have advantages and disadvantages of each (4). The utilization of technology in the field of health has been implemented in several countries in the world. Ministry of Health Regulation RI NO. 450/Menkes/IV/2004 on breastfeeding (BREAST milk) exclusively with the improvement Program of BREAST-feeding (PP-ASI) (5).

The utilization of technology becomes a part of helping to improve public health. Indonesia is developing M-health in this study used a model M-IB (Mobile information breastfeeding), which became part of efforts to help achieve breast milk. Based on the explanation above, it can be concluded that several problems can provide solutions to breast milk coverage, which is currently declined (6).

OBJECTIVE

The study aimed to develop and examine the MIB-Model and examine the effect of MIB-Model on behavior and self-efficacy of breastfeeding among mothers in breast milk breastfeeding.

METHOD

This research's application development method uses the *software development life cycle*(SDLC) with the waterfall model. Model testing conducted according to ISO 9126 Standard is a useful model because the model was built based on an international agreement. With the intervention group given the Model M-IB (Mobile Information breastfeeding) and in the control group was given counseling with a duration of 5-10 minutes

The population in this study were all existing nursing mothers Pengandan Puskesmas and Puskesmas Ngaliyan. In this study, the sampling technique used is non-probability sampling by consecutive sampling. The method of sorting the samples is done by selecting all the people who met and met the selection criteria until the desired number of samples met.

Android Application Program M-IB (mobile information breastfeeding) as an educational application program to help breastfeeding mothers get information is developed by information technology (IT) selected by the researcher. The purpose of the research

governs the main content. This application program's content is taken from several books and journals about breast milk and breastfeeding that has been highly relevant to obstetrics.

This research was registered at the Health Research Ethics Commission Faculty of Dentistry Dr. Moewardi General Hospital school of medicine university, 497 / IV / HREC / 2019

RESULTS

Feasibility test Model M-IB (mobile information breastfeeding)

1) Functionality Test

A functionality test is a test conducted to figure out the software product's ability to provide functions to operate in conformance under certain conditions. The functionality test was born on March 20th, 2018, with some expert validators of 2 people.

table 4.1, the functionality test Model M-IB (Mobile Information Breastfeeding) is showing into the category "good," but there are some suggestions given by the validators for the improvement and further development

Table 4.1 Results Functionality Model M-IB (Mobile Information Breastfeeding)

No.	Name	Value	Percentage
1	Expert 1	59	85%
2	Expert 2	56	81%
	Average		83%
	Category		Well

2) Reliability Test

The test is used to determine the product's ability to maintain a specified level of performance when used under the specified conditions. Based on table 4.2, the Reliability Test that has been done, the results show that the -IB (Mobile Information Breastfeeding) Model is "Enough" to be used.

Table 4.2 Reliability Test Results Model M-IB (Mobile Information Breastfeeding)

No.	Name	Value	Percentage
1	Expert 1	5	83%
2	Expert 2	4	66%
	Average		75%
	Category		Enough

3) Usability Test

The usability test was conducted on 20 respondents in Puskesmas Srondol with the following procedures. First, responders run "Model M-IB (Mobile Information Breastfeeding)," and second, respondents filled in the available questionnaires. Based on the usability test, results showed as follows: Feasibility Percentage Test:

$$\frac{\text{Score obtained}}{\text{Maximum Score}} \times 100\%$$

$$= \frac{513}{560} \times 100\%$$

$$= 91.6\%$$

According to the above result, it can be concluded that "Model M-IB (Mobile Information Breastfeeding) "Very Good to be used.

4) Efficiency Test

Table 3, the efficiency test that has been carried out shows that the M-IB (Mobile Information Breastfeeding) Model is "very good" to use

Table 3. Efficiency Test Results Model M-IB (Mobile Information Breastfeeding)

No.	Name	Value	Percentage
1	Expert 1	8	100%
2	Expert 2	8	100%
	Average		100%
	Category		Very good

5) Maintainability Test

Based on tables 4.3 and 4.4, show that the model M-IB (Mobile Information Breastfeeding) "Very good" to be used.

Table 4. Test Results Maintability Model M-IB (Mobile Information Breastfeeding)

No.	Name	Value	Percentage
1	Expert 1	6	100%
2	Expert 2	5	83%
	Average		91.5%
	Category		Very good

6) Portability test

The portability test is conducted by installing and running applications developed to various versions of the android system ranging from jelly beans, KitKat, Lollipop, Marsmellow, Nougat.

Table 4. 5 Test Portability Model M-IB (Mobile Information Breastfeeding)

No.	Version	Result	Information	Value
1	Jelly bean	can run	The data loading process goes well and quickly and does not happen to lag.	1
2	KitKat	can run	The data loading process goes well and quickly and does not happen to lag.	1
3	Lollipops	can run	The data loading process goes well and quickly and does not happen to lag.	1
4	Marsmellow	can run	The data loading process goes well and quickly and does not happen to lag.	1
5	Nougat	can run	The data loading process goes well and quickly and does not happen to lag.	1

Based on the test, Portability then obtained the following results:

$$\text{Test Scores obtained} \frac{\text{Portability X 100\%}}{\text{The total score of 5}} = 5 \text{ X } 100\% = 100\%$$

Based on the percentage gain on the portability test conducted, 100% is obtained, which means the application is very well used.

7) Recap of the Feasibility Test

Table 4.6 Results of Feasibility Model M-IB (Mobile Information Breastfeeding)

No.	Test	Result	interpretation
1	Functionality	83%	Well
2	Reliability	75%	Enough
3	Usability	91.6%	Very good
4	Efficiency	100%	Very good
5	Maintainability	91.5%	Very good
6	Portability	100%	Very good

Table 4.6 shows the results of each aspect being tested which will then be assessed as a whole using the following formula:

$$\text{On average Feasibility} = \frac{83\% + 75\% + 91.6\% + 100\% + 91.5\% + 100\%}{6}$$

$$= 90.1\%$$

The above calculation results of the feasibility of the overall percentage had an average rate of 90.1%. It was indicated that the interpretation of the Model M-IB (Mobile Information Breastfeeding) "Good" so that it can be concluded that it is feasible to use it because it meets ISO 9126 standards.

8) Material Aspect Test

Material aspect test intended to figure out the feasibility of the aspects of the application's materials. The results obtained from the validator will be analyzed. They will be converted into a percentage of the feasibility criteria to determine the material's feasibility on the developed applications.

Table 4.7 Material Aspects Test Results Model M-IB (Mobile Information Breastfeeding)

No.	Name	agency	Percentage
1	Expert 3	Ministry of Health Polytechnic Semarang	45
2	Expert 4	Health Office. Sambas	43
	Total		88

9) Testing of Intervention

Research carried out in primiparous nursing mothers in Puskesmas Ngaliyan and Pengadan in Semarang City. Then the researchers get the data characteristics of the respondents as follows.

According to Table 4.8, the number of control respondents age <20 is only one person in the control group (2.5%). About (90%) of respondents are in the 20-35 years old, partially (7.5%) in age> 35 years. Most respondents are junior high/high school (47.5%), D3 / D4 / S1 / S2 (52.5%), and LILA measurement results obtained about (25%) of mothers who experience chronic energy deficiency (KEK) and (75%) did not experience KEK. The analysis carried out obtained the value of p value> 0.05, which means that the respondent has a control intervention with the same variance (homogeneous).

Table 4.8 Distribution of respondents' characteristics among the intervention group and the control group

Characteristic	Control group (n = 20)		Intervention group (n = 20)		Total (n = 40)		p value
	F	(%)	F	(%)	F	(%)	
Age							
<20 Years	1	2.5%	-	-	1	2.5%	0.486
20-35 Years	17	47.2%	19	52.8%	36	90%	
> 35 Years	2	66.7%	1	33.3%	3	7.5%	
Education							0.342
SD	-	-	-	-	-	-	
Junior/High School	11	42.1%	8	42.1%	19	47.5%	
D3 / D4 / SI / S2	9	42.9%	12	57.1%	21	52.5%	
LILA (Nutritional Status)							0.642
KEK		25%		25%		25%	
not KEK		75%		75%		75%	

**Chisquare*

DISCUSSION

Model M-IB Design (Mobile Information Breastfeeding

Development of health education media for breastfeeding mothers with the Model M-IB (Mobile Information Breastfeeding) android based has gone through the stages of development. It refers to the provisions of ISO 9126, began with a series of tests including tests Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability. All these steps have shown an average of 90.6% to the category of "Good." The material contained in the Model M-IB (Mobile Information Breastfeeding) has passed the material aspects test carried out with two validator experts and showed 88% to the category of "Good."

Characteristics of Respondents

1) Age

Results of the analysis showed that the average respondent is at a healthy reproductive life is 20-35 years old, with a homogeneous result on both group P-value> 0.05, so the value in both groups have the same variance or homogeneous. Age is one aspect that affects milk production in mothers. It is in line with research conducted by Meiyana, stating that mothers aged 19-35 years, compared to mothers over 35 years. More producing milk because the body functions in the regulation of hormones are still very good, and it will affect the good production of the hormone prolactin.[7]

2) Education

Results of the analysis showed that education in the intervention group and the control group had the same variance (homogeneous) with P-value> 0.05, with the majority of education is at the intermediate level (47.5%) and higher education (52.5%).

The level of education will affect a person's response to the information. Education can increase the ability of individual behavior to achieve maximum health. The higher the individual's knowledge of the health, the easier it is to receive information that can help improve the mother's knowledge in breastfeeding her baby. Previous research results showed that the higher the mother's education level, the greater its desire for breastfeeding.

3) Mothers Nutritional Status

The analysis results obtained the good nutritional status of mothers in the intervention group, and the control group was 75% do not experience chronic energy deficiency (KEK) with P-value> 0.642. It was indicated that mothers' nutritional status in both groups has the same variance (homogeneous).

Balanced nutrition during breastfeeding is critical because it can affect milk production. Therefore, breastfeeding mothers' nutrition will affect mothers' nutritional status and the baby's development and growth. In the study conducted by Beatrix, soi showed that mothers with good dietary status would give more exclusive breastfeeding (13.3%) than the group of mothers with less nutritional status (7.5%).[8]

Analysis of Influence Model M-IB (Mobile Information Breastfeeding) against Behaviors and Self Eficacay Breastfeeding mothers

1. Difference primiparas Breastfeeding Behaviors Before And After Intervention.

Based on the analysis, the paired and unpaired test on the mother's behavior as assessed by the three domains of behavior: knowledge, attitude, and action. Knowledge is a symptom that people obtain through observation sense. Gaining education and information through Model M-IB (Mobile Information Breastfeeding) proved helpful in improving the knowledge of mother knowledge so that breastfeeding is going well. A previous study by Hesty showed that high knowledge in breastfeeding, 71.4% with a value of P-value = 0.044, showed a relationship between knowledge and breastfeeding.

Attitudes are a person's judgment of an object. Attitude changes occur if an individual can change the cognitive components first. From a paired and unpaired test, there is a difference in the value of P-value > 0.05. It was in line with Ernawati's research, which showed a difference in attitudes before and after the group's educational intervention, with a significant difference in the average attitude between intervention groups and P-value control = 0,000. The same results were also obtained from Kosnim's research indicating that infant feeding is meaningfully influenced by attitudes (Beta = 0.17; p-value 0.01).

Action is the realization of the knowledge and attitudes of a real deed. Action can also be interpreted as a person's response to the stimulus in a tangible or open form. Paired and unpaired test results get the P-value > 0.05. In difference between before and after the intervention and the difference between the intervention group and the control group. Ernawati's research showed an influence on maternal action with P-value 0.008 with the intervention model using group education. Action changes are a tangible result of the overall aspect of knowledge and attitude gained through educational programs. The overall change in parts of knowledge, attitudes, and actions will shape one's behavior.

It was consistent with the previous study that showed the Model M-IB (Mobile information Breastfeeding) improved the behavior. Utilization of Health can carry out Self-care in daily life. All human beings have Self-care needs and have the right to obtain their own needs, except when he is unable. Self Care theory is a ditheistic approach, whereby healthcare professionals strive to improve the client's ability to take care of themselves. Self Care is a behavior that can be learned

M-health Research on a small scale has shown the freedom to provide care for pregnant women. Dhadialla found that a maternal health project in Tanzania with the M-health tool is successful because it can facilitate local ownership and product innovations that meet customers' needs (health workers and communities).

According to Notoatmodjo, health education media is based on the principle that the knowledge that exists in every human being is received or captured through the five senses. The more the senses are used, the more and more precise knowledge gained. Using the Model M-IB (Mobile Information Breastfeeding) is better than counseling methods, success in intervention use mobile applications. It was in line with research conducted money J. C by assessing the usability of applications. The intervention showed that technological interventions were more effective in promoting breastfeeding compared to the traditionally face-faced intervention.

2. Differences in Self-Efficacy Breastfeeding primiparas Before and After Intervention

The importance of mothers' confidence in breastfeeding is expected to improve confidence and courage to care for their babies because from there. There will be contact to create bonding between mother and baby. One aspect that affects breastfeeding success and caring for a baby is the mother's conviction (self-efficacy). Effective lactation counseling enhances breastfeeding ability and maternal self-efficacy.

Retnayu's research results showed no difference between the treatment and control groups with the value P = 0,104. Self-efficacy is formed based on three levels of dimensions to enhance Self-efficacy for breastfeeding: technique, interpersonal thought, and support (support). Seventy-one factors that can affect Self-efficacy include culture, gender, the nature of the faced, external incentives, status, individual roles in the environment, and self-ability information.[10]

The research conducted by Komalasari presented low self-efficacy caused by the insufficient guidance from the health officer about the implementation of breastfeeding, which leads to poorly understood by learning mothers. The self-efficacy level affects the mother's commitment to breast milk success that tends to focus on the negative aspects of breastfeeding as in pain and anxiety that mothers feel while breastfeeding. The study explained that the factor that affects breastfeeding self-efficacy is mothers' motivation, support of husbands, and the support of healthcare personnel who have a significant relationship in the increase of self-efficacy.

Previous studies have shown that support is one of the factors that can affect. Breastfeeding self-efficacy such as Rebecca's research on the results that social support given to nursing mothers does not directly affect the pattern and duration of breastfeeding,77 but has a significant influence on the Breastfeeding self-efficacy. Another study explained that the age of mothers who are too young, low income, and giving birth in Caesar might affect Breastfeeding self-efficacy.

Breastfeeding Self Efficacy gains from the source of information and the workplace and level of education and mother experience in dealing with particular circumstances. Breastfeeding Self-efficacy is not an effective form of breastfeeding factor.

3. Differences Baby Weight Before and After Intervention

A Baby's weight is the benchmark in a baby's health, development, and growth of babies monitored through their body weight. Breast milk is the best nutrition for babies in their first six months. Infants are given exclusive breast milk having an ideal body weight. Research conducted by Beatrix Soi et al. with a value of P = < 0.05 of baby's growth given exclusive breast milk is better than not given exclusive breast milk.[8]

The growth of the baby's weight is optimal with the feeding process more effectively with the correct breastfeeding techniques stages both of attachment and position, so that a fair nursing process provide comfort to the baby.

CONCLUSION

Model M-IB (Mobile information breastfeeding) is feasible and can improve the behavior of nursing mothers and babies' weight and can not improve the self-efficacy mother.

RECOMMENDATION

1) Model M-IB (mobile information breastfeeding) was feasible and could be recommended as education media for health programs.
2) Use of the Model M-IB (mobile information breastfeeding) in health promotion. Health workers can use this media. They can be used individually by the mothers, thus increasing the mother's independence because it can be used anytime and anywhere.
3) For further research need to improve the content of the media using the online version for easy used

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