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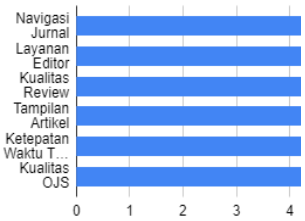

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Original Research

Health Education Using Mobilephone Application To Prevent Breastfeeding Problems

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ABSTRACT

Background: *Low exclusive breastfeeding rate in Indonesia is influenced by several factors. Exclusive breastfeeding rate in Indonesia is 65.16%. Breastfeeding problems affected exclusive breastfeeding duration among Indonesian breastfeeding women. Health education is needed to prevent and manage breastfeeding problems. This study aimed to analyze the effect of providing education using a mobile phone to improve mother's knowledge about breastfeeding problems prevention.*

Methods: *This study used a true experiment with control group pretest and posttest design. The sampling techniques used in this study was simple random sampling, consisted of 54 respondents which divided into intervention group and control group. This study was conducted in Banyumas District, Central Java province, Indonesia. The population in this study was breastfeeding mothers. The demographic characteristic questionnaire and the Breastfeeding Experience Scale (BES) were used to collect the data. All data were normally distributed and analyzed using paired t-test and independent t-test.*

Results: *There was a significant difference between pretest and posttest scores in the intervention group ($t=0.03$, $p<0.05$) and no significant difference between in the control group ($t=0.161$, $p>0.05$). Mean of post-test scores in intervention and control group were 28.18 and 30.19, respectively. There was a difference of post-test scores between the intervention and control groups ($t=0.000$, $p<0.05$).*

Conclusion: *The results of this study revealed that a mobilephone application has been proven effective in reducing the breastfeeding problems. We recommend develop the application to address more complex breastfeeding problems.*

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INTRODUCTION

Breastmilk is the most effective and safe nutrition for infant. World Health Organization (WHO) recommends every mothers to provide only breastmilk to their infants, since birth until six months of infant's age and continue breastfeeding until the age of two years with supplemental food (WHO, 2015). The exclusive breastfeeding

rate in the world was 38% (WHO, 2017). While in Indonesia, the exclusive breastfeeding rate was 65.16% and it is below the Indonesia Ministry of Health's target which counted at least 80% of infants should exclusively breastfeed (Indonesia Ministry of Health, 2018).

The low exclusive breastfeeding rate in Indonesia was caused by several factors such as lack of knowledge of breastfeeding mothers, perceptions of low breastmilk production, physical problems, lack of family support (Kartikasari, Anggraeni, Latifah, & Setiawati, 2019), lack of workplace support, negative attitude towards exclusive breastfeeding, and breastfeeding problems (Anggraeni, Punthmatharith, & Petpichetchian, 2020).

The impact of non exclusive breastfeeding to infants are increase risk of death from diarrhea, colic, food allergies, asthma, diabetes, and chronic digestive tract diseases (Adiningrum, 2014). The under-five mortality rate due to diarrhea in 2018 reached 12.3%, a little decrease compared to the previous year, which was 18.5% (Indonesia Ministry of Health, 2018). The non-exclusive breastfeeding practice is influenced by several factors.

One of the significant contributed factor is breastfeeding problems such as sore nipples, inappropiate breastfeeding technique, problems with the nipples, breast problems such as swelling, blocked ducts, mastitis, and breast abscesses (Zangmo, Wangmo, Tobgay, & Gurung, 2018). These breastfeeding problems can be prevented by increasing mother's knowledge about breastfeeding problems' prevention and management.

Health education may be used to increase mother's knowledge related to breastfeeding problems prevention. Previous studies using several health education method to manage breastfeeding problems, such as prenatal counceling (Shafaei, Mirghafourvand, & Havizari, 2020), post-natal counceling (de Oliveira, Giugliani, & Santo, 2006), proactive lactation management and social support, prenatal education/counselling/ motivation/follow-up, high motivation, using of breast milk, olive oil, breast shield, feeding with container and pacifier, moist warm application (Karacham & Saglik, 2018).

Nowadays, mobile application has been used to deliver health education effectively (Fitriani, 2011). The use of electronic media in Indonesia reached 171.17 million (64.8%), almost half (49.52%) of Indonesian women in productive age (19-34 years) used internet (APJII, 2018). The use of mobile phone has been proven as a health promotion media, *Ayah ASI*-a mobile phone application was effective to increase husband's exclusive breastfeeding knowledge and support in intervention group. The mean of breastfeeding knowledge pretest and post-test scores were 6.5 and 8.1, respectively.

The t-test result showed that there were a significant differences between breastfeeding knowledge pre and post test scores among intervention group ($p<0.05$) (Budianto & Handayani, 2017). Another study found that the use of *Gadget Pintar* (Gapin) mobile application was effective to increase adolescent's knowledge and attitude about premarital sex (Turah, 2018). However, there is no previous study developing a mobile phone application to increase mother's knowledge about breastfeeding problems prevention.

This study aimed to analyze the effect of providing education using a mobile phone to improve mother's knowledge about breastfeeding problems prevention.

MATERIALS AND METHOD

The research design of this study was *a True Experiment with Control Group Pretest and Posttest Design*. The study was conducted June-August 2019 in the Primary Health Center Purwokerto Utara 1, Banyumas District, Central Java Province. The population in this study were breastfeeding mothers with babies 0-4 months seen from the time the mother combined work and breastfeeding. The population in this study was 181 breastfeeding mothers. The sample size was calculated using unpaired numerical analytic formula $n_1 = n_2 = 2\ \frac{(Z\alpha+Z\beta)^2 S}{(X_1-X_2)^2}$ and previous study's proportion and standard deviation (Susanto, Anggraeni, & Susmarini, 2017).

Based on the the calculation, this study need 24 respondents in each group and the researches added 10% more if there were respondents withdrew from this study. So, there were 27 respondents in each group. This study used a simple random sampling, which selected respondents randomly using a shuffling method and respondents were included in the intervention or control group according to the paper that came out of the shuffling.

There were 54 respondents in this study which divided into 27 respondents in the intervention group and 27 respondents in the control group. The inclusion criteria of respondents in this study were breastfeeding mothers, had infants aged 0-4 months, had single infant, had full-term infant, had android-based *smartphones*, and willingness to participate in this study. While the exclusion criteria in this study were mothers who had a history of breast surgery, history of taking cancer drugs, HIV/AIDS, herpes, Tuberculosis, syphilis, or cancer, mother who had infants who been treated in the Neonatal Intensive Care Unit, infant who had indications of formula milk feeding, infants who had diseases or anomalies such as cleft lip, esophageal atresia, and mothers who withdrew from the study.

The sample in this study were recruited using a probability sampling method with simple random sampling technique. The number of sample in each group was 27 respondents. The instruments used in this study were the demographic data questionnaire and the Breastfeeding Experience Scale (BES) questionnaire, which was developed by Wambach in 1997 (Wambach, 1997) and has been translated into Indonesian and tested validity and reliability (Anggraeni, Punthmatharith, & Petpichetchian, 2020). The results of BES questionnaire validity and reliability test were 0.8 and 0.89, respectively.

The data were collected from December 2019 to January 2020. Data were collected door to door by researcher accompanied by a health care volunteer. Each eligible mother was approached, explained the study purpose, procedure, and risk, prospective mothers who interest to participate in this study were asked to fill informed consent and signed to show their willingness to participate in this study. Respondents both in the intervention and control group performed pretest. After that, respondents in intervention group were requested to install the-*MAPSI* and posttest was carried out 7 days later.

During this seven days, the researchers monitored respondents 2 times, in the 3rd and 6th days, used a social media (WhatsApp) in order to remind respondents to read the application and ask the respondent to let the researchers know when they already read the application. While, respondents in the control group performed posttest in the same day with respondent in the intervention group however, the researcher let them

know about the *MAPSI* after performed posttest. This study used univariate data analysis to report the respondents' demographic characteristics.

The breastfeeding problems data normality was examined using a Saphiro-Wilk test. Since all the data normally distributed, the differences of pre and posttest scores in intervention and control group were examined using a pair t-test, while the differences between post-test scores of intervention and control group were examined using independent t test. This study had ethical approval from Institutional Review Board Faculty of Medicine, Universitas jenderal Soedirman No. 020/EC/KEPK/XI/2019.

RESULTS

Table 1 showed that the mean of respondents' age in intervention group and control group were 29.67 years old and 31.67 years old, respectively. The majority of respondents' graduated Junior High School (35.2%). Most of respondents in this study were housewives (53.7%). The majority of respondents had income more than regional minimum standard (61.1%). Three-quarter of respondents' delivered vaginally (77.7%).

Table 1. Characteristics of Respondents Based on age, last education, occupation, income level, and type of delivery in the intervention group and control group

Variable	Intervention Group		Control Group		Total		*p*
	f	%	f	%		%	
Age (Mean, SD)	29.67	(4,899)	31.63	(4,978)			0.941
Level of education							
Elementary School	6	11.1	4	7.4	10	18.5	0.890
Junior High School	10	18.5	9	16.7	19	35.2	
Senior High School	6	11.1	7	13.0	13	24.1	
University	5	9.3	7	13.0	12	22.3	
Working status							
Working	16	29.6	9	16.7	25	46.3	0.289
Housewives	11	20.4	18	33.3	29	53.7	
Family income							
< IDR1,750,000	9	16.7	12	22.2	21	38.9	0.137
> IDR 1,751,000	18	33.3	15	27.8	33	61.1	
Type of delivery							
Vaginal	22	40.7	20	37.0	42	77.7	0.200
Section Caesarian	5	9.3	7	13.0	12	22.3	

Table 2 showed the mean of pre-test in the intervention group and control group were 29.034 and 30.22, respectively. The mean of post-test in the intervention group and control group were 28.19 and 30.15, respectively. The pair t-test results showed that there were significant differences between pre-test and post-test in intervention group ($p < 0.05$) and no significant difference between pre-test and post-test group in control group ($p > 0.05$).

Table 2. The differences of pre-test and post-test scores in the intervention group and control group

Group		n	mean	*SD*	*p*
Intervention	*Pre-test*	27	29.04	7,23	0.003
	Post-test	27	28.19	6,79	

Group		n	mean	*SD*	*p*
Control	*Pre-test*	27	30.22	7.55	0.16
	Post-test	27	30.15	7.54	

Table 3. showed that the mean of pre-test score in the intervention group and control group were 29.04 and 30,22. respectively. The independent t-test result showed that there was no significant difference of pre-test scores between intervention and control group (p>0.05). Table 3. showed that the mean of post-test score in the intervention group and control group were 28.18 and 30.19. respectively.

The independent t-test result showed that there was significant difference of post-test scores between intervention group and the control group (p<0,05). These results indicate that there was a significant difference in post-test scores after provided a mobile phone application (*MASI*) between the intervention group and control group.

Table 3. The differences of pre-test and post-test scores between the intervention and control group

Group		n	mean	*SD*	*p*
Pretest	*Intervention*	27	29.04	7.23	0.53
	Control	27	30.22	7.55	
Posttest	*Intervention*	27	28,18	6,79	0.000
	Control	27	30,19	7.54	

DISCUSSION

The homogenity test results in this study showed that there were no significant differences of demographic data between intervention and control group. This study found that the mean of the respondents' age in the intervention group and the control group were 29 years old and 31 years old, respectively. The respondents' age were in the range of childbearing age. According to the Central Statistics Agency (2019), the majority of Indonesian female in childbearing age ranged from 15 to 49 years old. The majority of respondents in this study graduated Junior High School.

This results in line with the data from Central Statistic Agency which stated that the majority of Indonesian graduated Junior High School are 90.71% and 89.55% in urban areas and rural areas, respectively (Central Statistics Agency, 2019). The low education level might due to the study setting is in rural area. The majority of respondents in this study were housewives. This result in line with previous study results which showed that the majority of respondents were housewives so, they had time to looking for information and practice several strategies to prevent and overcome breastfeeding problems (Susanto, Anggraeni, & Susmarini, 2017).

This study showed that the majority respondents had family income more than minimum regional wage. Previous study revealed that family income had no significant effect on knowledge and incidence of breastfeeding problems (Susanto, Anggraeni, & Susmarini, 2017). It might due to managing breastfeeding problems do not require high cost so breastfeeding women may solve the breastfeeding problems without any expense.

The majority of respondents in this study giving birth per-vaginal. Respondent in this study reported that they experienced sore nipples, breast engorgement, and swollen breast. The breastfeeding problems commonly occur among post vaginal delivery mothers were sore nipples, swollen breasts, blocked milk ducts. Post section caesarian women may experience delayed breastfeeding which cause breast engorgement and

lactation physiological process disturbances (Boskabadi, Ramazanzadeh, Zakerihamidi, & Omran, 2010).

There were no differences of the breastfeeding problems between the intervention and the control group before being given a mobile phone application. The incidence of breastfeeding problems may be influenced by various factors such as age, economic status, early pacifier use (Margawati, 2017), history of breast surgery (Eglash & Simon, 2010), type of exercise, early breastfeeding initiation, breastfeeding attachment, prematurity, experience, breastfeed 8 times per day, cultural beliefs, and lack of support (Boskabadi, Ramazanzadeh, Zakerihamidi, & Omran, 2014).

The results in this study showed that there were significant differences breastfeeding problems before and after provided MAPSI application. Several previous study found that a mobile phone application may increase respondent's knowledge. This was in accordance with previous study which showed that an android based application effective to increase husband's knowledge and husband's support in exclusive breastfeeding (Budianto & Handayani, 2017).

The results of another study found that the use of the Smart Gadget application (Gapin) was effective to increase adolescent's knowledge and attitudes about premarital sex (Turah, 2018). There was no breastfeeding problems' knowledge decrease in the control group, this study result in line with previous study result which revealed that there was no breastfeeding problem's change among control group in posttest (Susanto, Anggraeni, & Susmarini, 2017), it might due to there is no information obtained in the control group. Individuals who do not get information stimulus have no knowledge and attitude increasing (Wawan & Dewi, 2010).

The results of this study indicate that there were differences of breastfeeding problems between the intervention and the control group after provided a mobile phone application. A mobile phone applications was an effective media to increase knowledge, attitude, and health practice (Budianto & Handayani, 2017). Previous study proved that the Smart Mother Healthy Baby (BCBS) smartphone application was effective to increase the pregnant women's knowledge and attitude about childbirth (Agustina, 2019).

The media used in this study was a smartphone application which used widely as a learning method in education and health sector nowadays (Divya & Kumar, 2016). Indonesian postpartum mothers choose to access information related to breastfeeding using internet because it is easy to use and provided fast information (Anggraeni, Aji, Setiyani, Kartikasari, & Rahmawati, 2018).

CONCLUSION

MAPSI-mobile phone application is effective to improve mother's knowledge about breastfeeding problems prevention. We recommend to the next study to develop *MAPSI* to address more complex breastfeeding problems.

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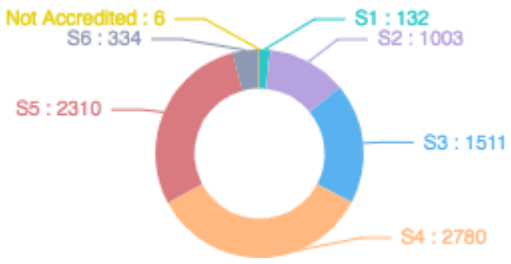

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