



ISSN 2354-7642 (Print), ISSN 2503-1856 (Online)  
Jurnal Ners dan Kebidanan Indonesia  
Indonesian Journal of Nursing and Midwifery  
Tersedia online pada:  
<http://ejournal.almaata.ac.id/index.php/JNKI>

**JNKI (Jurnal Ners dan Kebidanan Indonesia)**  
**(Indonesian Journal of Nursing  
and Midwifery)**

## **Comparison of booklet educational media effectiveness toward exclusive breastfeeding adherence**

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### **ABSTRAK**

**Latar Belakang:** Pemberian air susu ibu (ASI) eksklusif adalah pemberian makan pada bayi dengan ASI saja dan tidak ada makanan tambahan, air, atau cairan lain (kecuali obat-obatan dan vitamin, jika diperlukan) selama 6 bulan pertama kehidupan. Praktek pemberian ASI eksklusif di Indonesia pada bayi usia 4–5 bulan sebesar 27%, pada bayi usia 5–6 bulan sebesar 3,4 %. Masalah utama adalah kurangnya pengetahuan, yang berpengaruh terhadap perilaku, motivasi serta kepatuhan pemberian ASI eksklusif. Upaya yang dilakukan adalah menyediakan media yang tepat dan dapat diterima oleh masyarakat

**Tujuan:** menganalisis perbandingan efektivitas media edukasi antara aplikasi dan booklet terhadap kepatuhan ibu dalam pemberian asi eksklusif.

**Metode:** menggunakan rancangan quasi experiment, dengan pre post test with control group design. Subjek penelitian adalah ibu yang mempunyai bayi umur 4–6 bulan di wilayah kerja Puskesmas Gamping II Kabupaten Sleman, terdiri atas 3 desa yaitu Banyuraden (8 pedukuhan), Nogotirto (8 pedukuhan), Trihanggo (12 pedukuhan) Pengambilan sampel dengan purposive sampling, penarikan sampel dengan simple random sampling. Jumlah sampel pada kelompok kontrol dan kelompok intervensi masing masing 32 responden, sehingga total sampel 64. Kepatuhan pemberian ASI eksklusif diukur dengan kuesioner pengetahuan, sikap, dan frekuensi pemberian ASI dalam 24 jam. Analisis komparatif dilakukan dengan Mann Whitney dan Mc Nemar

**Hasil:** diperoleh nilai p antara pretest dan posttest pada kelompok intervensi  $p = 0,109$ , disimpulkan bahwa tidak terdapat perbedaan yang bermakna antara kepatuhan sebelum diberikan intervensi aplikasi dan kepatuhan setelah diberikan treatment aplikasi. Sedangkan untuk kelompok kontrol  $p = 0,039$ , dapat disimpulkan terdapat perbedaan yang bermakna kepatuhan sebelum diberikan booklet dan setelah diberikan bookle

**Kesimpulan:** Media edukasi booklet lebih meningkatkan kepatuhan pemberian ASI eksklusif karena model media edukasi dalam bentuk booklet merupakan media edukasi yang sudah familier dan sering digunakan sebagai media pembelajaran, bersifat praktis, mudah dalam pendistribusiannya serta unggul pada visual, lebih menarik dan mudah untuk digunakan Media edukasi aplikasi dapat meningkatkan pengetahuan dan sikap pemberian ASI eksklusif

**KATA KUNCI:** aplikasi; booklet; kepatuhan; media edukasi

### **ABSTRACT**

**Background:** Exclusive breastfeeding provides infants with breast milk and no additional food, water, or other liquids (except medicines and vitamins, if necessary) for the first 6 months of life. Current practice of exclusive breastfeeding in Indonesia among

infants aged 4-5 months is 27%, while between age 5-6 months is 3.4%. The main contributing factors of the poor adherence to exclusive breastfeeding is the lack of knowledge, which affects behavior and motivation. Producing inclusive, appropriate, and acceptable media is essential to manage this issue.

**Objectives:** The current study aimed to compare the effectiveness between application and booklet as educational media toward mother's adherence in exclusive breastfeeding.

**Methods:** A quasi experimental study with pre-post test with control group design carried out. The research subjects were mothers with infants aged 4-6 months in the administrative area of the Gamping II Public Health Center, Sleman Regency and consist of 3 villages; Banyuraden (8 hamlet), Nogotirto (8 hamlet), Trihanggo (12 hamlet) Sample determined with purposive sampling, while recruitment performed by simple random sampling. The number of samples in the control and intervention groups were 32 respondents, and total sample is 64. Exclusive breastfeeding adherence was evaluated by knowledge, and attitudes questionnaire, validated with breastfeeding record within 24 hours. Comparative analysis was performed with Mann Whitney and Mc Nemar test.

**Results:** p value yielded from pretest and posttest in the intervention group  $p=0.109$ . It was inferred that there was no significant difference of breastfeeding adherence in association with the intervention. The control group p value was  $p=0.039$  indicating significant difference of adherence in breastfeeding practice.

**Conclusions:** Booklet improves adherence to exclusive breastfeeding due to the depth of materials, familiar for the intended audience, practical, easy for content distribution, visually captive, attractive and easy to use. In-app educational media could increase knowledge and attitudes in particular to exclusive breastfeeding.

**KEYWORD :** adherence; application; booklet; educational media

Article Info :

Article submitted on March 10, 2023

Article revised on May 05, 2023

Article received on May 18, 2023

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## INTRODUCTION

Exclusive breastfeeding contribute to eliminate infant morbidity and mortality (1). Optimum breastfeeding delivery can prevent 1.4 million mortalities worldwide in infants annually and reduce deaths due to acute respiratory infections and diarrhea by 50–95%. Suboptimal breastfeeding confirmed to be the leading cause of 45% of neonatal deaths due to infectious infections, 30% of deaths due to diarrhea, and 18% of deaths due to acute respiratory disorders among children below five years of age in developing countries (2).

International guidelines endorse breastfeeding for the first 6 months based on

scientific evidence regarding its advantages for infants' survival, growth and development. Breast milk is the perfect source of nourishment for babies because it contains the essential nutritional elements for ideal growth and development(3).

Poor breastfeeding practice in the family is the leading cause of malnutrition in infants and toddlers. Confounding factors for exclusive breastfeeding delivery are associated with scarce knowledge support among mothers especially regarding breastfeeding techniques and managing lactation difficulties, family support as well as culture and community norms. In addition, the main problem with lack

of exclusive breastfeeding practice is the inadequate understanding. It affects individual behavior and motivation which in turn halted the effectiveness of exclusive breastfeeding for up to 6 months (4). United Nations Children's Emergency Foud (UNICEF) reported mothers' illiteracy about the importance of breast milk, proper breastfeeding technique, and exacerbated by aggressive marketing of artificial milk are inhibiting factors for the formation of parental awareness in exclusive breastfeeding<sup>(5)</sup>.

Failure to breastfeed are subject to internal factors within the mother, including breastfeeding difficulties experience, low education level and employment status (6). Psychological conditions are legitimate factors for mothers and significant others in provisioning successful breastfeeding, including confidence, commitment and adherence to exclusive breastfeeding. Limited knowledge also causes non-compliance with programmed therapy and instructions from healthcare providers(7).

Information support is a factor that is highly relevant for optimum breastfeeding practice. Various efforts have been introduced to to assist mothers in modifying their exclusive breastfeeding behavior by distributing applicable and acceptable media to the community(8). Booklet are common form of media which offers comprehensive information for the public as it features self-contained materials, flexible in time, convey rich-messages in different settings of healthcare practice " (9). Similarly, mobile applications have the characteristics of flexibility, adaptability, target penetration, cost-effectiveness and an acceptability for health promotion. Mobile applications are attributed

for behavioral changees such as goals, self-efficacy, self-monitoring, feedback, and planning. The application showcases universally acceptable contents, attractive and adaptable. The use of booklet augmented with video and discussion has been proven to increase the knowledge and attitude of mothers in exclusive breastfeeding(10).

## **MATERIALS AND METHODS**

A quasi-experimental study, pre post test design with control group conducted to assess adherence of exclusive breastfeeding. The research divided participants into the intervention group and the control group. The intervention group received in-app education, while the control group entitled for booklet media.

The subjects in this study were mothers with infants aged 4-6 months, registered within the administrative service of Gamping II Primary Health Care, Sleman Regency. A total of 32 mothers for the intervention group and 32 mothers for the control group were recruited. A purposive sampling technique implemented in this study. The research sample allocation was determined by randomization using simple random sampling technique. Banyuraden village with a total sample of 32 participants chosen for the booklet intervention, while the application group was retrieved from Trihanggo village.

Participants in this study fulfilled the following inclusion criteria: housewives, mothers with infants aged 4-6 months, children never been consuming any food or liquid other than breast milk, non malnourished infants, attending satellite healthcare services for monitoring, normal labors, able to read and write, and in

possession for Android smartphone.

The application educational media used in the intervention group used the smart mother application which had been tested through research and due diligence on the play store, while the booklet educational media used in the control group was an educational media booklet that had been modified from the Sleman District Health Office with validity test results 0.3 and reliability test 0.82

The instruments used in this study were knowledge, attitudes questionnaires and observation sheets for 24h breastfeeding frequency. The statistical test for comparative analysis was the Chi Square test, while relationship analysis was performed using Chi Square analysis. Results indicate significant findings with  $p < 0.05$ . Mann Whitney test employed for variable analysis of pretest and posttest among the intervention group and

control group. Comparison of breastfeeding adherence carried out using the Mc. Nemar test. The current study has been ethically approved with record No. 1110/UN6.CI.3.2/KEPK/PN/2016.

## RESULTS AND DISCUSSION

### RESULTS

Results analysis of the comparative study on the effectiveness of educational media between applications and booklets toward mother's adherence in exclusive breastfeeding includes participant characteristics, comparison of knowledge scores, comparison of attitudes, and comparison of the educational media effectiveness.

Descriptive statistical analysis was carried out for univariate description of participants characteristics in the form of a frequency distribution. Participants'

**Table 1. Participants' Characteristics**

Characteristics	Intervention n (32)	Control n (32)	p value
Age (Years)			0.322*
<20	0	2	
20-35	27	24	
>35	5	6	
Education			0.563*
Elementary	0	1	
Junior High School	7	5	
Senior High School	19	17	
University	6	9	
Parity			0.053*
Nullipara	0	0	
Primipara	16	10	
Multipara	15	15	
Grandmultipara	1	7	

\*Chi Square Test

**Table 1** indicated that in terms of age from two treatment groups were dominated between ages of 20-35 years. Participants' level of education primarily high school graduates for both groups, and the pregnancy profile predominantly primiparas in the

intervention group by 16 mothers while the control group were 10 primiparas and 15 multiparas. Statistical test yielded a significant difference ( $p > 0.05$ ), highlights the applicability for data comparison.

**Table 2. Pre and post knowledge scores comparison between the intervention group and the control group**

Knowledge Score	Group		p value
	Intervention (n=32)	Control (n=32)	
Pre			
Means (SD)	56.7 (15.6)	49.6 (15.1)	0.064*
Median (Range)	54 (31-92)	46(31-77)	
Post			
Means (SD)	68.5 (15.2)	62.0 (14.9)	0.075*
Median (Range)	69 (31-92)	69 (31-85)	
Pre and post knowledge	$p < 0.001^*$	$p < 0.001^{**}$	
% increase in knowledge	17.80%	23.30%	0.652

Test Description: \*) Mann Whitney test, \*\*) Wilcoxon

**Table 2** demonstrated that no significant difference obtained from both intervention and control groups ( $p > 0.05$ ). However, increased mean and median scores observed in posttest evaluation from the two treatment groups. The median pretest knowledge value of the intervention group was 54 while the posttest median value increased to 69. It indicated improved knowledge from the participants who received applications

educational media. Similar trends occurred in the control group, increasing knowledge median score from 46 to 69. Booklet materials enhanced participants' knowledge. Provision of educational media either through applications or booklets potential to improve exclusive breastfeeding knowledge, as demonstrated by rising median value and the mean score between before and after study treatments.

**Table 3. Pre and post attitude scores comparison between the intervention group and the control group**

Attitude Score	Group		p value
	Intervention (n=32)	Control (n=32)	
Pre			
Means (SD)	80.6 (8.3)	77.5 (7.2)	0.135*
Median (Range)	80 (64.4-95.5)	77.7 (64.4-91.1)	
Post			
Means (SD)	88.1 (7.1)	84.3 (8.1)	0.033*
Median (Range)	86.6 (75.5-97.7)	84.4 (73.3-95.5)	
Pre and post attitude	$p < 0.001^*$	$p < 0.001^{**}$	
% increase in attitude	8.11%	6.07%	0.747

Test Description: \*) Mann Whitney test, \*\*) Wilcoxon

**Table 3** reflected no significant difference from the pretest evaluation ( $p > 0.05$ ). Contrary, posttest evaluation indicated significant difference between the intervention group and the control group ( $p < 0.05$ ). Mothers' attitude from the intervention group enhanced, as shown by increasing median score from 80 to 86.6. In congruence to the findings, the median pretest score of the control group

increased from 77.7 to 84.3.

**Table 4** showed the p value between pretest and posttest from two treatment groups. It is inferred that no significant difference was reported from the intervention group. In contrast, the p value from the control group yielded  $p = 0.039$  revealed a significant difference between breastfeeding adherence before and after the treatment.

**Table 4. Educational media effectiveness toward breastfeeding adherence**

	Adherence	Pre		Post		p
		n	%	n	%	
Application	Adherence	21	65,6	27	84.4	0.109*
	Non-adherence	11	34,4	5	15,6	
Booklet	Adherence	15	46,9	23	71.9	0.039*
	Non-adherence	17	53,1	9	28,1	

Note: \* Mc Nemar's test

## DISCUSSION

Compliance in exclusive breastfeeding is strongly influenced by internal factors including age. Table 1 demonstrated that the current study subjects predominantly between 20-35 years old in both groups. The age group classified as reproductive, which allows individuals to easily absorb information and gradually develop their knowledge. The more depth and width of knowledge and information acquired, it develops person's thinking skills –(11).

Age affects adherence to exclusive breastfeeding, due to appropriate level of knowledge about breastfeeding and the benefit of exclusive breastfeeding is required. The preliminary knowledge and information obtained by the participants originating from counseling sessions which was routinely offered by health volunteers together with the Gamping II Primary Health Care in both groups. The current study improved

participants' knowledge in both groups after treatment being delivered. Increasing participants' knowledge about exclusive breastfeeding in both groups influenced by the provision of information. The provision of educational media modified participants' knowledge level. Initiative to enhance breastfeeding mothers' knowledge limited to counseling sessions in each village through satellite events without accessibility to take-home educational contents.

Level of education considered having influence toward breastfeeding adherence. The average level of education in both groups was primarily high school, with 36 participants (56.25%). Mother's level of education and access to mass media also influences decision making, where higher education level are correlated to greater possibility for provisioning exclusive breastfeeding. A high level of formal education can indeed establish progressive values in a person, especially in

accepting new knowledge, including the importance of exclusive breastfeeding for infants –(11).

High school graduates are open to new information, so that new knowledge can be incorporated. The level of education also affects attitudes as mothers will improve their behaviour about breastfeeding and increase satellite healthcare visits in developing their knowledge. The results of this study showed that the majority of mothers with secondary education levels provide exclusive breastfeeding for at least 6 months. Mothers dedicated more attention to the prerequisites for participating in exclusive breastfeeding and recognize about the meaning and benefits of exclusive breastfeeding(12).

Based on the parity status, most of the study subjects in the intervention group were primiparas while those in the control group were multiparas. These differences are based on the participant's profile according to the inclusion criteria. Parity has no correlation with exclusive breastfeeding because the main factors that influence adherence to exclusive breastfeeding are knowledge, attitudes, and behavior. Mothers with two or more children (multipara) reported productive breastmilk production compared to first child experience (primipara)(6).

The main factors affecting adherence to exclusive breastfeeding are knowledge, attitude and behavior. Extensive knowledge increased mother's understanding. Mothers who acknowledged exclusive breastfeeding are capable of modifying their attitudes, manifested by the behavior of continuing breastfeeding practice until the infants at least 6 months old. Non conflicting findings reported from current study, whereas posttest attitude

evaluation indicating significant difference between the treatment group and the control group ( $p < 0.005$ ). Participants' attitude as shown in Table 3 increased from 80 to 86.8 while in the control group the median score improved from 77.7 to 84.3.

Knowledge, attitudes, and behavior are influencing factors for exclusive breastfeeding adherence. Attitude defined as a reaction or response of individuals who remains disapprove stimulus or object. Attitude manifestations rarely seen immediately, but can only be interpreted in advance from the closed behavior (13). This is consistent with the results of the current study, that booklets affected adherence to exclusive breastfeeding with a value of  $p=0.039$ . Significant difference indicated from this study, for mothers' adherence before and after the treatment. This study also demonstrated that booklet are contributing factors for increased knowledge, attitudes, and behavioral changes since breastfeeding mothers were more involved to attend satellite healthcare, amplified the frequency of breastfeeding, continued to provide exclusive breastfeeding for at least 6 months, and were more open to new information regarding the breastfeeding difficulties that they encountered. This was also supported by the active role of the health volunteers from the booklet group, as well as the support from breastfeeding mobilization team and village stakeholders through community-based programs.

Breastfeeding adherence in the intervention group yielded  $p > 0.05$ . Despite no statistical difference inferred from the analysis, increasing in knowledge, attitude before and after application educational

reported. The educational media is suitable to increase knowledge and attitude scores, but not optimal to modify breastfeeding adherence. Lack of participation to attend satellite healthcare and reluctance in terms of seeking information, poor exclusive breastfeeding practice are related to previous experience and the participant's belief and ancestors' cultural influences.

Mothers with adequate knowledge of breastfeeding are 5.4 times more likely to provide exclusive breastfeeding for 6 months. The high proportion of mothers who have appropriate knowledge about exclusive breastfeeding is a result from contribution of several factors including the effectiveness of educational media that are generally used in the community and increased support from breastfeeding groups.<sup>38</sup> Attitudes obtained through experience will have a direct influence on behavior. Mothers who received information about breastfeeding from healthcare professionals before the labor are associated with longer exclusively breastfeeding practice ( $p=0.0232$ )(14).

Media effectiveness affects knowledge, attitudes, and adherence. The current study suggested that booklets further increase adherence to exclusive breastfeeding. This can also be observed based on increasing knowledge, attitude and adherence scores " (9). A booklet is an educational media that is frequently provided by the district health agency and other counseling services. Despite the booklet are subject to content variations, the community is familiar with this type of educational media. Booklet is a practical information medium that currently being used, easy for the distribution process, and features a visual dimension in

the form of images, leads to attractive and easy to use(15).

The current research showed that adherence can be increased by providing information through appropriate media. The facts that patients could fail to recall information up to 72% of verbal information require alternative approach. Efforts that can be made to assist mothers in modifying their behavior, especially in increasing adherence to exclusive breastfeeding are to offering appropriate, easy to use, and acceptable media. Booklets are media that are easy and acceptable to the public.

Statistical analysis from the intervention group showed that there is no significant difference between pre and post, but based on knowledge and attitudes between pretest and posttest increased median and average scores are reported. It can be concluded that application is suitable to enhance mother's knowledge and attitudes in regard to exclusive breastfeeding. The application is a newly recognized media by the public, especially breastfeeding mothers(10).

Educational media features a flexible medium, easy to use and can be adapted to the needs of participants. In this study, educational media in the form of application classified as a brand-new media for the community within the administrative area of Gamping II Primary Health Care. However, the booklet is accessible, easy to understand and in accordance with the needs of participants. Information about exclusive breastfeeding is directly incorporated to allow participants to dig deeper into contents that have not been presented on the menu. In addition, combination of images increased motivation to engage in learning, therefore attracts more



attention and able to clarify facts (16). The combination of images serves as a message channel to the recipient through visual sense which is attributed to graphical symbols so that it can be successful and efficient. It is implicitly explained that educational media is more interesting and effective for education purpose in particular to improve knowledge and attitudes as validated through the current study evaluations(15).

Current study demonstrated that booklets have the potential as a flexible, adaptable, broad-reaching, cost-effective and an acceptable means of health promotion medium. Other studies mentioned that audiovisual combinations are employed for various health domains with rich information packages. It confirmed that utilize thought-provoking booklets to provide health interventions or combined with applications have the ability to stimulate behavior change such as goals, self-efficacy, monitoring, feedback and planning; easily accepted, attractive and flexible medium (17). This is consistent with the theory that the use of mobile applications will promote simple changes in knowledge, and attitude recorded based on educational evaluation. Phone application has the potential for information dissemination and training, and the use of mobile applications can strengthen health systems to manage disease and improve health(10).

## **CONCLUSION AND RECOMMENDATION**

Booklet educational media increased adherence to exclusive breastfeeding due to the properties of familiarity, primarily used as a learning medium, practical, easy to distribute, visually advantages, more attractive and

easier to use. Application could increase exclusive breastfeeding knowledge and attitudes.

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