[jkg] Editor Decision

1 message

Ni Made Nopitawati <ners.pita@gmail.com> Wed, Sep 14, 2022 at 2:22 PM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>, Haneda Yorika Fauzia <fhanedayorika@gmail.com>, Nina Setiawati <nina.setiawati@unsoed.ac.id>

Mekar Dwi Anggraeni, Haneda Yorika Fauzia, Nina Setiawati:

We have reached a decision regarding your submission to (JKG) Jurnal Keperawatan Global, "THE IMPACT OF NUTSI-SMARTPHONE APPLICATION ON NUTRITIONAL KNOWLEDGE AMONG BREASTFEEDING MOTHERS: A QUASY-EXPERIMENTAL STUDY".

Our decision is to: Accept Submission

Ni Made Nopitawati
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(JKG) Jurnal Keperawatan Global

A-401-Article Text-1029-1-4-20220215.docx
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[jkg] New notification from (JKG) Jurnal Keperawatan Global

1 message

Ni Made Nopitawati <ners.pita@gmail.com> Mon, Sep 19, 2022 at 3:26 PM
Reply-To: Rendi Editya Darmawan <litbangpolteksolo@gmail.com>
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>

You have a new notification from (JKG) Jurnal Keperawatan Global:

You have been added to a discussion titled "Draft Article" regarding the submission "THE IMPACT OF NUTSI-SMARTPHONE APPLICATION ON NUTRITIONAL KNOWLEDGE AMONG BREASTFEEDING MOTHERS: A QUASY-EXPERIMENTAL STUDY".

Link: http://jurnalkeperawatanglobal.com/index.php/jkg/authorDashboard/submission/401

Rendi Editya Darmawan

(JKG) Jurnal Keperawatan Global

[jkg] Editor Decision

1 message

Ni Made Nopitawati <ners.pita@gmail.com> Mon, Sep 19, 2022 at 3:27 PM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>, Haneda Yorika Fauzia <fhanedayorika@gmail.com>, Nina Setiawati <nina.setiawati@unsoed.ac.id>

Mekar Dwi Anggraeni, Haneda Yorika Fauzia, Nina Setiawati:

The editing of your submission, "THE IMPACT OF NUTSI-SMARTPHONE APPLICATION ON NUTRITIONAL KNOWLEDGE AMONG BREASTFEEDING MOTHERS: A QUASY-EXPERIMENTAL STUDY," is complete. We are now sending it to production.

Submission URL: http://jurnalkeperawatanglobal.com/index.php/jkg/authorDashboard/submission/401

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JURNAL KEPERAWATAN GLOBAL
POLTEKKES KEMENKES SURAKARTA
ISSN: 2528-0102 E-ISSN: 2580-5916
SK KEMENRISTEK DIKTI NOMOR 21/E/KPT/2018

Round 1 Status
Submission accepted.

Notifications

[jkg] Editor Decision	2022-07-18 02:25 AM
[jkg] Editor Decision	2022-09-14 07:22 AM
[jkg] Editor Decision	2022-09-19 08:27 AM

Reviewer's Attachments

Search

1237-1 , 401-Article Text-1029-1-4-20220215.docx	July 15, 2022

JURNAL KEPERAWATAN GLOBAL

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

IMPACT OF NUTSI-SMARTPHONE APPLICATION ON NUTRITIONAL KNOWLEDGE AMONG BREASTFEEDING MOTHERS: A QUASY-EXPERIMENTAL STUDY

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ABSTRACT

Background: Nutrition knowledge among breastfeeding mothers is a key factor of good nutrition status. Some breastfeeding mothers in Indonesia suffered inadequate nutrition status which may affect exclusive breastfeeding practice. However, a little breastfeeding women have adequate nutritional knowledge. Health education about adequate nutrition during lactation is highly needed. The study aimed to determine the effect of a "Nutsi" smartphone application towards nutritional knowledge among breastfeeding and low-income women.

Methods: This was a quasy-experimental study with control group, pretest and posttest design was conducted at the work area of the Panyingkiran Public Health Center, Majalengka Regency, West Java Province, Indonesia. This study used a consecutive sampling method and involved 78 respondents which divided into 39 respondents in intervention group and 39 respondents in control group. Data were collected using a set of questionnaires. Then, data were analyzed using Wilcoxon test and Chi-square test.

Results: This study found that there was a significant difference between pre-test and post-test scores in the intervention group (t=0,000 p<0,05). There was not significant difference between pre-test and post-test scores in the control group (t=1, p >0,05). Furthermore, there was a significant difference of post-test scores between intervention and control groups (t=0,000 p<0,05).

Conclusion: The developed smartphone application-*Nutsi*-was effective to increase nutritional knowledge among lactation mothers. Health care providers may use *Nutsi* as a health promotion media in order to improve nutrition knowledge among pregnant women.

ARTICLE HISTORY
Received :
Accepted:

KEYWORDS
breastfeeding, smartphone application, knowledge, nutrition

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Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

BACKGROUND

Infant Mortality Rate (IMR) is the number of infant death in every 1000 infants. IMR is an indicator to assess the people's welfare in the health sector. South East Asia is one of regions that has the highest infant mortality rate (WHO, 2022). IMR in Indonesia is around 19.548 per 1000 live births in 2020 (UNICEF, 2022). IMR may be prevented by practicing exclusive breastfeeding, especially among child in developing countries (WHO, 2022). Providing exclusive breastfeeding may save infant's life in developing countries (Clente E Pretorius, Hannah Asare, Herculina S. Kruger, John Genuneit, Linda P. Siziba, 2021).

Exclusive breastfeeding was influenced significantly by maternal's nutritional status (Ivanda Glanny Anindya, Harsono Salimo, Yulia Lanti Retno Dewi, 2020). Maternal nutrition affects breastmilk composition. Poor maternal nutrition status is significantly associated with low breastmilk quantity and quality. Breastmilk DHA levels is associated significantly with maternal fish diet (Shiksha Adhikari, Urszula Kudla, Jean Nyakayiru, Elske M. Brouwer-Brolsma, 2021). Food consumption during lactation affect breastmilk micronutrient among lactation women (Agnieszka Bsikowska-Jura, Aneta Czerwonogrodzka-Senczyna, Gabriela Oledzka, Dorota Szostak-Wegierek, 2018).

Adequate nutrition for lactating mothers is important for both maternal and child health. Sufficient nutrients during breastfeeding is needed in order to produce high quality breastmilk and prevent breastfeed mothers from malnutrition (Nichole E. Marshall, Barbara Abrams, Linda A. Barbour, Patrick Catalano, 2021). Unbalanced maternal nutrition during breastfeeding affect the breastfeeding mother such as fatigue which also may cause low breastmilk supply. Insufficient nutrient intake may cause breastfeeding mother take the deficiency nutrient from the body's stores (UNICEF, 2022) https://www.unicef.org/nutrition/maternal. The impact of nutritional deficiencies in breastfeeding mothers are anemia, iodine deficiency disorders, vitamin D deficiency, lack of protein energy, and decreased breastmilk supply (Winarsih, 2018). Maternal eating behavior and dietary intake significantly affects exclusive breastfeeding duration (Ina Olmer Specht, Jeanett Friss Rohde, Nanna Julie Olsen, Berit Lilienthal, 2018). A breastfeeding mothers should pay attention to nutritional intake such as fluid volume, supplement, food intake in order to produce a high quality of breastmilk (Otik Widyastutik, Yuwan Chartasim, Elly Trisnawati, Selviana, 2021). The breastfeeding mothers' nutritional needs are higher than non-breastfeeding mothers (UNICEF, 2022) https://www.unicef.org/nutrition/maternal. Breastmilk supply is influenced by the frequency of nipple sucking and the volume of breastmilk is influenced by maternal hydration status (Kominiarek & Rajan, 2016).

Maternal nutritional knowledge affect nutritional status among breastfeeding mothers. Nutrition knowledge is a key factor which may influence eating behavior among breastfeeding mother (Tritya, 2017).

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

Breastfeeding mothers who had high nutrition knowledge tend to practice adequate diet (Demissie Gelaw Tessema, Eshertu Gimma, Tefera Chane Mekonnen, Wondwosen Mebratu, 2020). Previous study found that the majority (57.8%) of breastfeeding mothers in developing countries had low nutritional knowledge (Temesgen Desisa Hundera, Habtamu Fekadu Gemede, Dessalegn Wirtu, 2015). In addition, nutritional information related to sufficient nutrition among breastfeeding mothers may affect breastmilk production (Otik Widyastutik, Yuwan Chartasim, Elly Trisnawati, Selviana, 2021).

Breastfeeding mother needs appropriate information about nutrition during breastfeeding in order to achieve better knowledge about nutrition in breastfeeding mothers so that they can apply awareness of breastfeeding mothers in order to realize their nutritional needs during lactation period. Previous study revealed that more than one third (35.7%) of breastfeeding mothers in Indonesia suffered poor nutrition (Nining Tyas Triatmaja, Oktovina Rizky I, Ahmad Hidayat, 2018) and the majority of the breastfeeding mothers (65.5%) had lack of knowledge about nutrition during breastfeeding in Indonesia (Wahyuna & Abidin, 2013), while a good nutrition practice affects the exclusive breastfeeding duration (Maimunah Abul Rohman, Burhannudin Ichsan, Nining Lestari, Tri Agustina, 2021) and breastmilk production (Prialita, Della Krisma, 2021). Therefore, increasing knowledge about appropriate nutritional among Indonesian breastfeeding mothers is highly needed.

Nurse play an important role to provide health education related to adequate nutrition during breastfeeding. The development of information and communication technology in the current era shows the use of internet and social media (APJII, 2018). There are so many innovations and changes in communication media that are increasingly attracting public interest. Various methods and media have been used for health education such as a smartphone application (Agustina 2019). A smartphone application was effective to increase husband's knowledge and support to exclusive breastfeeding practice (Budianto & Handayani, 2017) and pre-marital sex knowledge among teenager (Turah, Anggraeni & Setiawati, 2019). There is no previous study aimed to develop a smartphone application to nutritional knowledge among breastfeeding women. This study aimed to develop and determine the effect of *Nutsi* to nutritional knowledge among breastfeeding women.

METHODS

The research design used in this study was a quasi-experimental with control group pretest and posttest design. It was conducted at Majalengka Regency, West Java Province in July - August 2020. The population in this study were breastfeeding woman who had child age 0-24 months old. The inclusion criteria in this study were women who breastfeeding, had a child aged 0-24 months old, had an android-based

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

smartphone, can read, and willing to participate in this study. While the exclusion criteria in this study were respondents who had visual impairments, and respondents who withdraw from the study. They were enrolled using a convenience sampling method. The total sample was 78 respondents which divided 39 respondents in intervention group and 39 respondents in control group.

Subjects that meet all the inclusion criteria were informed about this study's purpose, benefits, procedure and potential risks. They were also assured about their anonymity and provided information how to install the Nutsi application and answer the questionnaire. All of the subjects signed consent to show their agreement to participate in this research. This study had an Institutional Review Board and Ethics approval from the Committee of the Faculty of Health Sciences, Jenderal Sudirman University (Number. 116/EC/KEPK/VI/2020).

This study used Demographic Characteristics Questionnaire which developed by the researchers and Balanced Nutrition Knowledge of Breastfeeding Mothers Questionnaire from Ma'munah (2015). The researchers had modified the questionnaire and tested for content validity. In this study, the researcher conducted a content validity test to add and change more appropriate sentences on several question items and were assessed by two maternity specialist nurses whom working as nurse practitioners. The results of content validity test of Balanced Nutrition Knowledge of Breastfeeding Mothers Questionnaire were obtained with a mean value of 4.2 while the mean value of the results of sentence grammar was obtained 4.55.

The intervention in this research is health education through a smartphone application, named Nutsi (Lactation Nutrition) which can be downloaded in the Playstore for free. The researcher did literature review to create the content of the application included the definition and benefits of breastfeeding, the nutritional needs of breastfeeding mothers, the importance of nutrition for breastfeeding mothers, daily meal arrangements, and examples of healthy diet menus for breastfeeding mothers. Then, the researchers asked three experts in breastfeeding area to provide content validity approval for the application contents. Respondents in both intervention and control group were asked to fill Demographic Data Questionnaire and did pretest used Balanced Nutrition Knowledge of Breastfeeding Mothers Questionnaire. After that, respondents in the intervention group were asked to download Nutsi in their smartphone and read the content of Nutsi. Respondents in both intervention and control group were asked to did posttest used Balanced Nutrition Knowledge of Breastfeeding Mothers Questionnaire one day after pretest. Then, researchers provided information to respondent in the control group about Nutsi and let them to download in their smartphone.

Data were analyzed using a univariate and bivariate analysis method. The univariate analysis results presented in the frequency

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

distribution a percentage of age, mother's education, occupation, and income. The bivariate analysis in this study was carried out with the Wilcoxon test and Kolmogorov-Smirnov test (Dahlan, 2019).

RESULTS

The characteristics of the respondents showed in table 1. The majority of respondents in both groups were aged 20-35 years old, graduated Senior High School, housewives, low income (< IDR 1.750.000). The homogeneity value in both groups were *p* >0.05, which mean that the demographic data in both groups were homogeneous.

Table 1 Demographic Characteristics of Respondents

Characteristics	Intervention group		Control group		Total	%	*p*
	n	(%)	n	(%)			
Age							
<20 years	2	5.1	2	5.1	4	5.1	0.788
20-35 years old	29	74.4	27	69.2	56	71.8	
>35 years old	8	20.5	10	25.6	18	23.1	
Level of Education							
Primary School	4	10.3	10	25.6	14	17.9	
Junior High School	10	25.6	9	23.1	19	24.4	0.169
Senior High School	13	33.3	13	33.3	26	33.3	
University	12	30.8	7	17.9	19	24.4	
Working status							
Housewives	30	76.9	36	92.3	66	84.6	0.117
Working	9	23.1	3	7.7	12	15.4	
Income							
< IDR 1.750.000	24	61.5	25	64.1	49	62.8	
>IDR 1,750,001	15	38.5	14	35.9	29	37.2	1

Table 2 showed the difference in the pretest scores level of breastfeeding knowledge between the intervention and control group (*p*>0.05). The results of the analysis of the Chi-Square test conditions are not met so that an alternative that can be done is the Kolmogorov-Smirnov test (Dahlan, 2014).

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

Table 2 Differences of pretest score between the intervention and control group

	Knowledge level						Total		*p*
Group	**Good**		**Moderate**		**Low**				
Pretest	**n**	**%**	**n**	**%**	**n**	**%**	**n**	%	
Intervention	8	20.5	27	69.2	4	10.3	39	100	0.986
Control	12	30.8	22	56.4	5	12.8	39	100	

Table 3 showed the difference in the posttest scores level of breastfeeding knowledge between the intervention and control group. There was a difference in the post-test scores level of breastfeeding knowledge between the intervention and control groups ($p<0.05$).

Table 3 Differences of pretest score between the intervention and control group

	Knowledge level						Total		*p*
Group	**Good**		**Moderate**		**Low**				
Posttest	**n**	**%**	**n**	**%**	**n**	**%**	**n**	%	
Intervention	38	97.4	1	2.5	0	0	39	100	0.000
Control	11	28.2	23	59.0	5	12.8	39	100	

Table 4 showed that there was a difference between the pretest and posttest scores in the intervention group ($p<0.05$) and there was no significant difference between the pretest and posttest scores in the control group ($p>0.05$).

Table 4. The Difference of Pretest and Posttest Scores within the Intervention and Control Groups

Group	**Knowledge Level**						**Total**		***p***
	High		**Medium**		**Low**				
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
Intervention									
Pretest	8	21	27	69	4	10	39	100	0.000
Posttest	38	97	1	3	0		39	100	
Control									
Pretest	12	31	22	56	5	13	39	100	1
Posttest	11	28	23	59	5	13	39	100	

DISCUSSION

In this study, the majority of respondents in both groups were in the age range between 20-35 years old. Mothers with an age range of 20 to 35 years is a safe age for pregnancy, childbirth and breastfeeding so that it can be said at that age is very supportive for breastfeeding (Rahmawati, Bahar, & Abdul, 2013). Most of the respondents' education level was Senior High

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

School. Education is one of the factors that influence knowledge (Notoatmodjo, 2014). Education is also an important factor to get and digest information more easily (Minato et al., 2019). According to (Astutik, 2013), with most of the respondents graduated Senior High School, the higher education causes better understanding to health knowledge.

The majority of respondents' occupations in this study were housewives. According to the Indonesian Ministry of Health (2002), mothers who do not work tend to pay more attention to their daily diet and have the opportunity to prepare healthy food menus for themselves and their families. Meanwhile, mothers who work with prominent working conditions, excessive activity and lack of rest at work are at risk of nutritional deficiency if it occurs for a long time (Permatasari, 2015). The majority respondents in this study had low income. In this study, 19 respondents were graduated bachelor degree however their jobs were honorary teachers whose minimum wages were still far from the minimum wages in Majalengka District. In meeting daily needs, someone with a high wage level can reach the necessary needs including their nutritional needs (Hapsari, 2013). According to Quin (2006) economic factors can influence the need for information and education. However, family income does not directly affect knowledge, but is related to the availability of facilities that can support the need for broad insight and information (Notoatmodjo, 2010). In this study, the majority of respondents had a significant increase of nutritional knowledge, however lack of information about nutritional practice after got Nutsi application.

The results of this study found that there was no difference of pretest between intervention and control groups. It might due to the characteristics of respondents based on age, education level and family income are homogeneous, so that the characteristics of respondents do not affect the level of knowledge about nutrition among breastfeeding mothers. This result supports previous studies which revealed that there was no significant difference in pretest scores between the intervention and control groups before respondents getting the "Nutri Quiz Story" application (Fahrizki, 2017) and “Gapin” application (Turah, Anggraeni & Setiawati, 2019).

Health education provided by several types of media in order to increase human’s knowledge (Turah, Anggraeni & Setiawati, 2019). The results of this study supports previous study results which found that the android application media may increase posttest score in the intervention group. Previous studies revealed that “Breastfeeding Father” application was an effective media to increase posttest scores of exclusive breastfeeding knowledge among respondent in intervention group (Budianto & Handayani, 2017). In addition, Mitting application could increase posttest score of anemia preventive knowledge among respondent in intervention group (Fertimah, 2018).

Nutsi application is an effective media to increase nutritional knowledge among breastfeeding mothers. The increase in respondents'

Jurnal Keperawatan Global
Vol. 6, No. 1, June 2021
https://doi.org/10.37341/jkg.v5i2

knowledge significantly can be seen from the increase in the score of the question items in the questionnaire so that the results of the level of knowledge increase. Most of the information received by a person from audio visual media is channeled to the brain visually (sense of sight) around 75-83% (Notoatmodjo, 2010). Visual media was effective to increase menopause knowledge (Arifah, 2010). Some previous study revealed that application was effective to increase knowledge and attitudes of pregnant women about childbirth (Agustina, 2019) and attitudes about the importance of balanced nutrition among school children (Perdana, Madanijah & Ekayanti, 2017). It might due to internet based health education is an interested media to increase knowledge and attitude among young people in Indonesia nowadays (Anggraeni, Aji, Setyani, Rahmawati & Kartikasari, 2018).

Knowledge is influenced by several factors. Source of information is a main factor influencing knowledge. Health education is a source of information which aims to increase people knowledge (Notoatmodjo, 2014). Media is a key of health education successful. The media used in this study is a smartphone application which in this day and age has been widely used as a learning medium in the world of education and health (Divya & Kumar, 2016). This smartphone application media has advantages, including learning materials that can be presented in various methods, can be given to broad targets, can be accessed anywhere and anytime (Kusumadewi, 2009).

CONCLUSION

This study developed a smartphone application "Nutsi" as an effective educational media to increase knowledge of breastfeeding mothers' nutrition. Mothers who received health education about nutrition during breastfeeding through the Nutsi smartphone application experienced increased knowledge compared to those who did not use the Nutsi smartphone application. The Nutsi smartphone application can be used to increase knowledge, and also prepare women for lactation.

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Vol. 6, No. 1, June 2021
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Jurnal Keperawatan Global
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Revisions

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