

## A Randomized Controlled Trial of Knowledge Sharing Practice with Empowerment Strategies in Pregnant Women to Improve Exclusive Breastfeeding during the First Six Months Postpartum

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The objective of the study was to investigate whether a Knowledge Sharing Practices with Empowerment Strategic (KSPES) program on antenatal education and postnatal support strategies in experimental group improves the rates of 6 months exclusive breastfeeding during the first six months postpartum compared with Routine Standard Knowledge of Breastfeeding Techniques (RSKBT) in control group. A randomized controlled trial was conducted. Pregnant women of more than 32 weeks' gestation were randomly assigned to receive a routine standard knowledge of breastfeeding techniques alone (control group) or with KSPES on antenatal education and postnatal support strategies (experimental group). The primary outcome was proportion of exclusive breastfeeding at 6 months postpartum. The secondary outcomes were proportion at 7 days, 14 days, 1, 2, 3, 4 and 5 months postpartum. The results indicated that proportion of exclusive breastfeeding in the experimental group were significantly higher than the control group at 14 days (82.5% vs 52.6%,  $P<0.005$ ), 1 month (77.5% vs 52.6%,  $P=0.021$ ), 2 months (62.5% vs 36.8%,  $P=0.023$ ), 4 months (35.0% vs 7.9%,  $P=0.008$ ), 5 months (25.0% vs 2.6%,  $P=0.012$ ) and 6 months postpartum (20.0% vs 0%,  $P=0.005$ ). KSPES program on antenatal education and postnatal support strategies significantly improved rates of exclusive breastfeeding at 6 months postpartum. These strategies also significantly improved rates of exclusive breastfeeding at 14 days, 1, 2, 4, 5 and 6 months postpartum.

**Keywords:** breastfeeding, exclusive, knowledge sharing practices with empowerment strategies, standard knowledge

It is generally accepted that human breast milk is the best type of nutrition for neonates and infants (Gartner et al, 2005). Most health organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) have updated their recommendation that exclusive breastfeeding should be given until a baby is six months old before offering other additional food, and partial breastfeeding should be continued along with complementary feeding for at least the first two years of life (World Health Organization, 1982). Exclusive breastfeeding consists of only breast milk being given to infants. Medicine, vitamins, and oral rehydration solution may be given but no formula or water (Su LL et al, 2007). Breast milk promotes sensory and cognitive development, and protects the infant against infectious and chronic diseases. Exclusive breastfeeding reduces infant mortality resulting from common childhood illnesses such as diarrhea or pneumonia and aids for a quicker recovery from illness (World Health Organization, 2002). It could reduce infant mortality by 13% (Beasley A ET AL, 2007) and decrease the risk of morbidity from infection (Huffman SL et al, 1990:2001). Moreover, it increases infant immunity through generous nutrients for growth and development and also provides physiological and social psychological benefit as well as learning interactions and communication between parents and their infants (Bottorff JL et al, 1990).

Although there are many benefits to breastfeeding, its prevalence and duration in many countries is still lower than the international recommendation for exclusive breastfeeding for the first six months of life. In the United States, data from the national survey in 2004

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demonstrated that only 30.5% and 11.3% of mothers exclusively breastfed at the three and six months, respectively (World Health Organization, 2002). In Sri Lanka, the median duration of exclusive breastfeeding was four months. The rates of exclusive breastfeeding at four and six months were 61.6% and 15.5%, respectively (Agampodi SB, 2007). In Hong Kong, only 10% and 2% of mothers exclusively breastfed at three and six months, respectively (Wong EH, 2007).

In Thailand, the National Breastfeeding Project began in 1989. Its major objective was to promote postpartum mothers to exclusive breastfeeding for the first six months and breastfeeding with supplementary food until the infants were two years old. The main activities had been the promotion of the Baby-Friendly Hospital Initiative; legislation on maternity leave; and the Code of Marketing of Breast Milk Substitutes and related products. The development of the Baby-Friendly Hospital Initiative may partially explain the increase in the prevalence rate of breastfeeding. However exclusive breastfeeding had not shown a favorable increase. The survey in 2005 found exclusive breastfeeding at 6 months was only 14.5% while the national target of the Ninth National Health Development Plan (NHDP) had been set at 30% (Hangchaovanich Y, 2006). Recently, the prevalence of exclusive breastfeeding at six months in Bangkok was still low (11%) (Laisiriruangrai P, 2008). There were many factors affecting the success of breastfeeding promotion.

Although there had been many studies regarding intervention or instruments to increase the rates of exclusive breastfeeding for the recommended duration of six months (Su LL, 2007; Anderson AK, 2005), the success rates were still lower than the international recommendation (World Health Organization, 2002). Therefore, an additional special important strategy and technique for education and promoting the exclusive breastfeeding during the first six months among pregnant women are needed. From the compilation and review of various KSPES (Gibson CH, 1991), this should be the most appropriate method to change and motivate behavior of exclusive breastfeeding period 6 months postpartum. It is composed of knowledge sharing practices and Empowerment which knowledge sharing practices is top management support has been very effective in the organization under study as indicated by the existence of Knowledge Management technologies. The explicit and tacit knowledge in the organization is shared through knowledge sharing practices. In this case, the transmission of sensations, feelings or values plays an important role. Knowledge sharing practices model composed of communication, demonstration and display, best practices and storytelling. Also Empowerment process of Gibson (Gibson CH, 1991) who revealed that the mothers' commitment to, bond with, and love for, their child which motivated and sustained the process of empowerment, consisted of 4 steps as discovering reality, critical reflection, taking charge and holding on. KSPES is never applied with promoting exclusive breastfeeding during the first six months of life.

### **Research Questions**

1. Is the rate of exclusive breastfeeding during the first six months after delivery significantly different between the pregnant women receiving Knowledge Sharing Practices with Empowerment Strategies (KSPES) on antenatal education and postnatal support strategies and those receiving the standard knowledge of breastfeeding techniques alone?
2. Does the Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies in pregnant women improve the rate of exclusive breastfeeding during the first six months after delivery by 30%?

## **Research Hypotheses**

1. The rate of exclusive breastfeeding during the first six months after delivery is significantly different between the pregnant women receiving Knowledge Sharing Practices with Empowerment Strategies (KSPES) on antenatal education and postnatal support strategies and those receiving the standard knowledge of breastfeeding techniques alone.

2. Before the intervention, pregnant women who participate in the Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies will have the same mean score of the knowledge, the attitude and self-efficacy for self-management towards exclusive breastfeeding during the first six months after delivery, as those who do not.

3. Pregnant women who obtain the standard knowledge of breastfeeding techniques will have the same mean score of the knowledge, the attitude and self-efficacy for self-management towards exclusive breastfeeding during the first six months after delivery as before.

4. Pregnant women who participate in the Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies will have higher score of the knowledge, the attitude and self-efficacy for self-management toward exclusive breastfeeding during the first six months after delivery, than before.

5. After intervention, pregnant women who participate in the Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies will have a higher mean score of the knowledge, the attitude and self-efficacy for self-management toward exclusive breastfeeding during the first six months after delivery, than those who do not.

## **Research Objectives**

### **Primary Objective**

To investigate whether the knowledge sharing practices with empowerment strategies (KSPES) program on antenatal education and postnatal support strategies improve the rates of breastfeeding practices during the first six months after delivery compared with the standard knowledge of breastfeeding techniques.

### **Secondary Objectives**

1. To compare the difference of the mean scores for perceived knowledge, the attitude and self-efficacy for self-management towards exclusive breastfeeding in pregnant women during the first six months after delivery before intervention between a group of receiving Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies, and a group of receiving the standard knowledge of breastfeeding techniques alone.

2. To compare the difference of the mean scores for perceived knowledge, the attitude and self-efficacy for self-management towards exclusive breastfeeding in pregnant women during the first six months after delivery before and after receiving the standard knowledge of breastfeeding techniques.

3. To compare the difference of the mean scores for perceived knowledge, the attitude and self-efficacy for self-management toward exclusive breastfeeding in pregnant women during the first six months after delivery before and after receiving Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies.

4. To compare the difference of the mean scores for perceived knowledge, the attitude and self-efficacy for self-management toward exclusive breastfeeding in pregnant women during the first six months after delivery after intervention between a group receiving Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies, and a group receiving the standard knowledge of breastfeeding techniques alone.

5. To study the associated between breastfeeding practices and predisposing factors, enabling factors, reinforcing factors, and physiological factors.

6. To develop the concept of Knowledge Sharing Practices with Empowerment Strategies on antenatal education and postnatal support strategies in pregnant women in order to improve rate of exclusive breastfeeding during the first six months after delivery.

7. To study of the new instrument to encourage exclusive breastfeeding in pregnant women during the first six months after delivery.

## **Methodology**

### **Population**

Between January and March 2009, healthy pregnant women of more than 32 weeks gestation attending antenatal care clinics at both Department of Obstetrics and Gynecology, King Chulalongkorn Memorial Hospital, Faculty of Medicine, Chulalongkorn University and Theptarin Hospital, Bangkok, Thailand were recruited. The eligible pregnant were those with more than 32 weeks gestation, healthy, delivery of a full term healthy infants, no disease or contraindications to breastfeeding, no nipple abnormalities, and infants who had no sucking problems. They must be able to communicate with others, and have a telephone line. We excluded pregnant women with high risk and multifetal pregnancies.

The present study was approved by the Ethical Review Committee for Research Involving Human Research Subjects, the Health Science Group, the Ethics Committee of Faculty of Medicine, Chulalongkorn University, Thailand and the Ethics Committee on Researches Involving Human Subjects of Theptarin Hospital.

### **Samples**

The eligible women who signed an informed consent were randomized into two groups, the experimental and control groups. A randomized scheme was generated using a random number table. The co-investigator generated the allocation sequence, and principal investigator enrolled participants and assigned participants to their groups. When a woman met the present study inclusion criteria, the principal investigator picked up a sequentially numbered opaque envelope which contained a ticket identifying the group. The woman was then assigned to either the experimental or control group according to the ticket. Neither the provider nor the woman was blind to the treatment regimens.

### **Instruments**

A first self-administered anonymous written questionnaire that consisted of general information, knowledge about breastfeeding, attitudes towards breastfeeding and self-efficacy for self-management toward breastfeeding was completed. Then, the women in the control group received only a RSKBT, while the women in the experimental group received a RSKBT with a KSPES program on antenatal education and postnatal support strategies. The

KSPES program on antenatal education took about 3 hours by only principal investigator. A second self-administered written questionnaire was completed after receiving the knowledge.

### **Experimental Program**

They subsequently received routine intrapartum and postpartum obstetric care. All women in the experimental group were followed up with regard to exclusive breastfeeding by telephone interviews at 7 days, 14 days, 1, 2, 3, 4, 5, and 6 months after delivery and by home visits in cases that had problems with exclusive breastfeeding. Pregnant women in the control group receive a RSKBT at least 2 times. At the first time antenatal check-up, their breasts and nipples are checked, and any abnormality corrected such as by using Hoffman's maneuver or using breast cups to cover the nipples. At the second and subsequent antenatal check-ups, pregnant women receive advice on breastfeeding education such as benefits of breastfeeding, significance of exclusive breastfeeding, techniques in successful of exclusive breastfeeding, importance of breastfeeding immediately, disadvantages of formula milk and water, and ways to make sure for breastfeed when mothers have to return to work outside the house. Also document on breastfeeding was provided, that affects breastfeeding behavior of postpartum mothers. All the women in the control group were followed up with regard to exclusive breastfeeding by routine visit at 1, 2, 4 and 6 months postpartum at Pediatrics clinic. The KSPES program in antenatal education class was explored for the purpose of formalization, sharing discussion of their knowledge by storytelling, experience by best practices, demonstrating and displaying the thoughts of the pregnant women, which are the steps of the knowledge sharing practice and also applying them with empowerment based on Gibson's theory (Gibson CH, 1991), which consists of four steps, discovering reality, critical reflection, taking charge and holding on (Figure 1). In this way, it is the processional concept in leading to intrinsic and extrinsic development of the individuals to gain potential in accepting the situation and successful experience of exclusive breastfeeding. They could discover their own success in managing themselves to breastfeeding and also learn about the others' experiences. The former strategies were the most appropriate methods in changing and motivating behavior in the pregnant women for improving exclusive breastfeeding during the first six months. The demographic data and delivery outcomes were recorded.

The primary outcome was the rate of exclusive breastfeeding at 6 months postpartum in experimental and control groups. The secondary outcomes were rates of exclusive breastfeeding at seventh and fourteen days, one, two, three, four and five months postpartum. Exclusive breastfeeding was defined as only mothers' breast milk was the infants' food source, without the other oral rehydration solution including water. Predominant breastfeeding was defined as the infants were fed with the mothers' breast milk and water, sweetened water and juices without formula. Partial breastfeeding was defined as the infants were fed with the mothers' breast milk and complementary food such as formula milk, gruel, semisolids or solids. No breastfeeding meant the infants were fed only with formula milk and other liquids or food.

### **Statistical Analysis**

The sample size calculation was based upon the estimated rates of exclusive breast feeding at 6 months 5% in the control group (from pilot survey) and 30% in the experimental group. Thus, the authors needed 36 women in each group to detect statistical difference ( $\alpha = 0.05$ ,  $\beta = 0.2$ ). With adjustments for a withdrawal rate of 10%, a minimum of 40 women in each group were required.

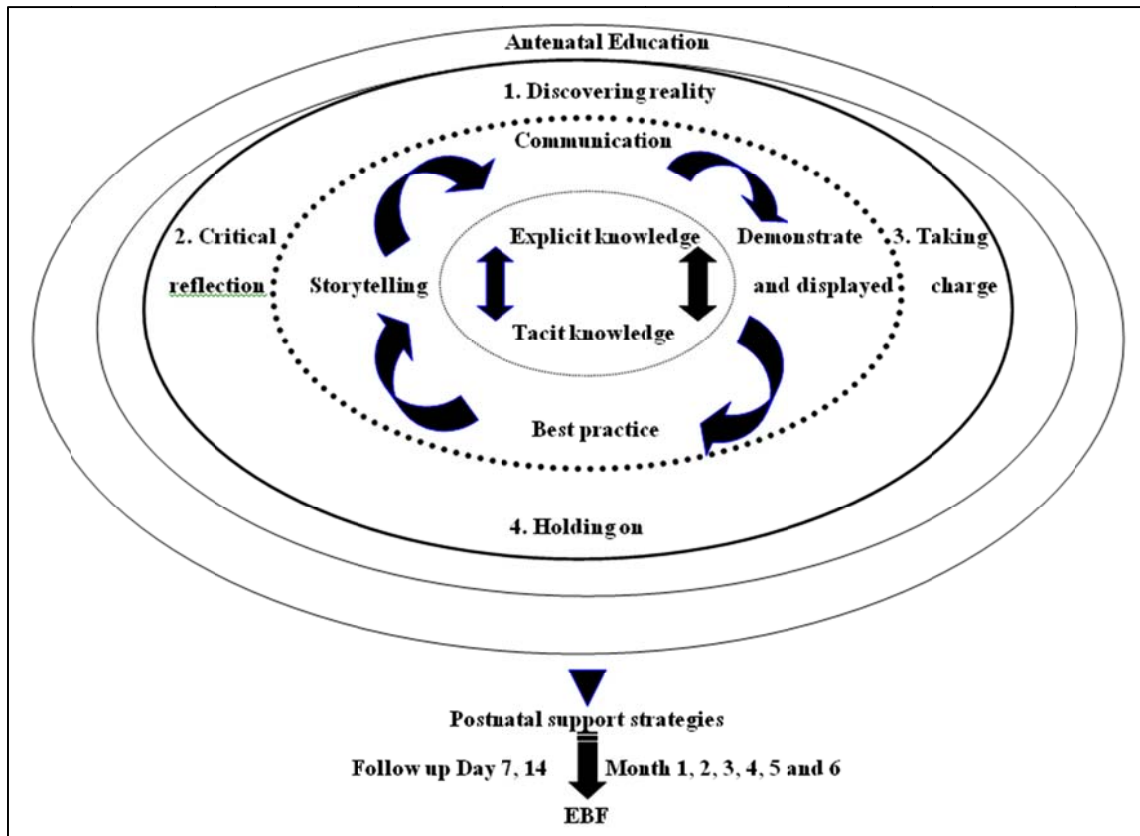


Figure 1. A Model for KSPES

Test-retest reliability was used for confirmation of the validity of the questionnaire. Categorical data was expressed by percentage and comparison was made by the chi-square test or Fisher exact test. Continuous variables were expressed as mean and standard deviations or median and compared by student t-test or Mann-Whitney U test. Intra-group comparison of continuous variables was carried out using paired t-test and unpaired t-test for inter-group comparison. A p-value < 0.05 was considered statistically significant.

## Results

Screening, randomization, a total of 80 women were enrolled in the present study, the women were equally randomized into two group (40 women were randomized in the experimental group, and 40 women in the control group). Sixty pregnant women were from King Chulalongkorn Memorial Hospital (75%), while 20 (25%) were from Theptarin Hospital. The follow-up was completed in October 2009. Seven women were lost to follow-up (3 in the study group and 4 in the control group). Two women in the control group were excluded; dead fetus in utero and neonatal death from heart disease at 1-month of age. A total of 71 (88.8%) women (37 in the experimental group and 34 in the control group) completed six months of follow-up. The demographic characteristics of the women according to group are summarized in Table 1. There was no statistical difference between the groups regarding age, religion, education, occupation, work place, family income, parity, family status, family's characteristics, intention and plan to breastfeeding. Both groups were also similar in mode of delivery and the infants' birth weight. Since 7 women were lost to follow-up, an intention-to-treat analysis, counting all lost to follow-up women as non-exclusive breastfeeding, was performed.

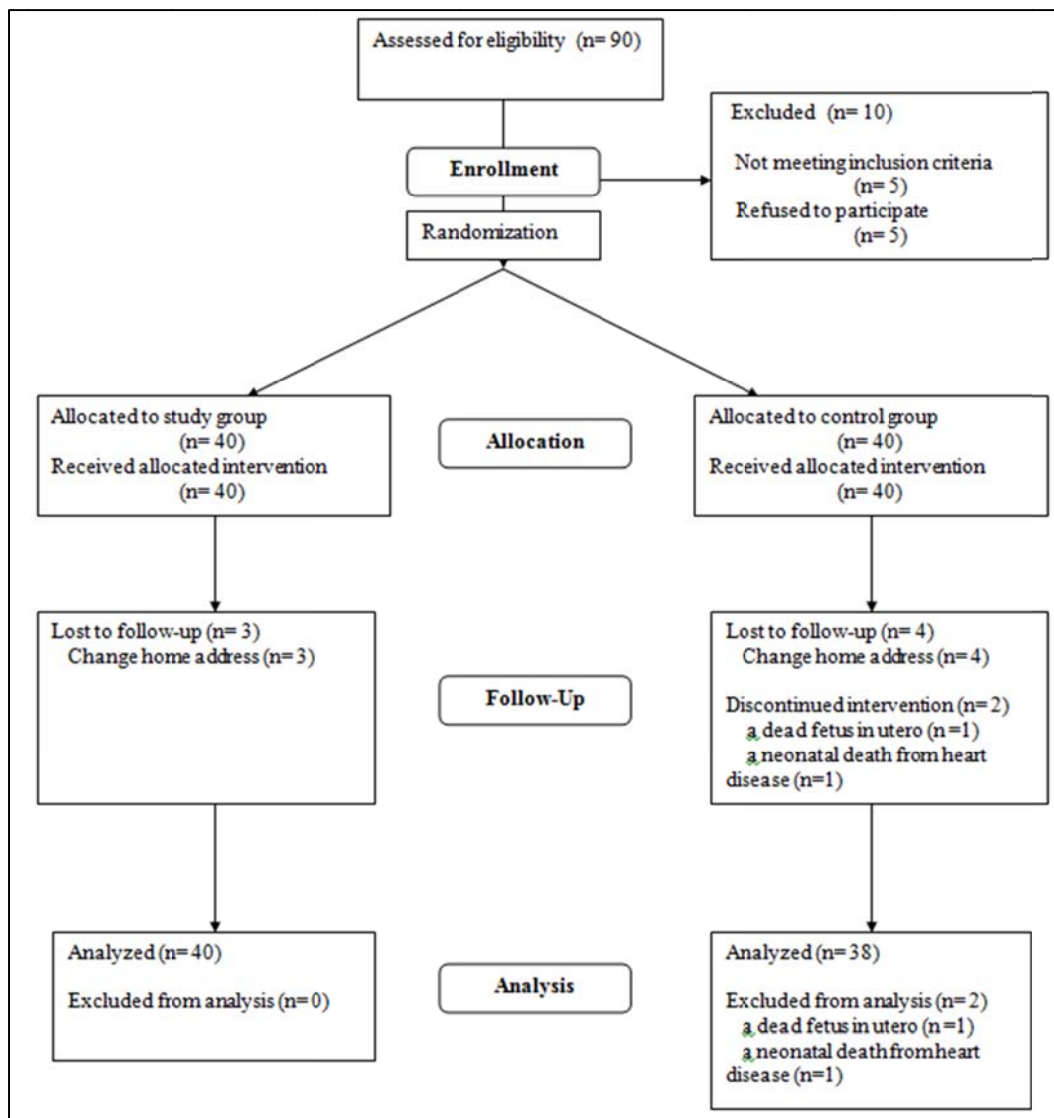


Figure 2. Profile of Patient Recruitment and Follow-Up Following Randomization to Either Experimental or Control Group

Table 2 shows the score of KSPES before and after intervention between the experimental and control groups. The mean scores of knowledge, attitude and self-efficacy for self-management before intervention in both groups were similar. While, the mean scores after intervention of the study group were significantly higher ( $P < 0.001$ ).

Table 3 shows the mean scores of knowledge, attitude and self-efficacy for self-management before and after intervention in the control group were similar. While, the mean scores after intervention were significantly higher than those before in the study group ( $P < 0.001$ ).

Table 4 shows the rates of exclusive breast feeding. Comparing with the control group, women in the experimental group had significantly higher rates of exclusive breastfeeding at 14 days, 1, 2, 4, 5 and 6 months. Rates of exclusive breastfeeding in the experimental group compared with those in the control group were 82.5% vs 52.6%,  $P = 0.005$  at 14 days, 77.5% vs 52.6%,  $P = 0.021$  at 1 month, 62.5% vs 36.8%,  $P = 0.023$  at 2 months, 35.0% vs 7.9%,  $P = 0.008$  at 4 months, 25.0% vs 2.6%,  $P = 0.012$  at 5 months, and 20.0% vs 0%,  $P = 0.005$  at 6

months. Rates of predominant breastfeeding were also significantly higher in the experimental group than those in the control group at 3, 5 and 6 months. But the rates of partial breastfeeding were no difference between groups. Rates of “no breastfeeding” were significantly higher in the control group than those in the experimental group at 2, 3, 4, 5 and 6 months.

Table 1

*Demographic Characteristic of the Experimental and the Control Group*

Characteristics	Experimental group N=40 N (%)	Control group N=40 N (%)	P value
Age (years) mean $\pm$ SD	27.8 $\pm$ 6.5	28.8 $\pm$ 6.3	0.508
Religion			0.314
Buddhists	40 (100%)	39 (97.5%)	
Muslims	0	1(2.5%)	
Education status			0.198
Primary school level	8 (20%)	7 (17.5%)	
Secondary school level	16 (40%)	17 (42.5%)	
Vocational education and Bachelor or higher level	16 (40%)	16 (40.0%)	
Occupation			0.376
Student and housewives	8 (20.0%)	9 (22.5%)	
Employees	11 (27.5%)	17 (42.5%)	
Private officials	8 (20.0%)	8 (20.0%)	
Government officials	4 (10.0%)	4 (10.0%)	
Business owners and trading	9 (22.5%)	2 (5.0%)	
Work place			0.626
At their house	13 (32.5%)	11 (27.5%)	
Outside their house	27 (67.5%)	29 (72.5%)	
Median of family income (Bahts/month) (Interquartile range)	12,500 (8,500-20,000)	16,000 (10,000-30,000)	0.151*
Parity			0.653
Primiparous	23 (57.5%)	21 (52.5%)	
Multiparous	17 (42.5%)	19 (47.5%)	
Family's status			0.589
Stay with husband (every day)	35 (87.5%)	33 (82.5%)	
Stay with husband (Some days)	4 (10.0%)	4 (10.0%)	
Separated from husband (Widow /Divorce)	1 (2.5%)	3 (7.5%)	
Family's characteristic			0.369
Single family (composed of wife and husband)	20 (50.0%)	24 (60.0%)	
Extended family (composed of wife, husband and relatives)	20 (50.0%)	16 (40.0%)	
Intention to breastfeeding			1.000
Having Intention	38 (95.0%)	37 (92.5%)	
Not having intention	2 (5.0%)	3 (7.5%)	
Plan to breastfeeding			1.000
Having plan	31 (77.5%)	31 (77.5%)	
Not having plan	9 (22.5%)	9 (22.5%)	

\* Data was presented as median and comparison by Mann-Whitney U test



Table 2

*Mean Scores of Various Topics Related to Women Pregnancy in the Studying Group Before and After Intervention*

Topics	Experimental group N=40	Control group N=40	P value
Knowledge about breastfeeding			
Before	8.8 $\pm$ 2.8	9.7 $\pm$ 3.2	0.175
After	18.7 $\pm$ 0.7	9.5 $\pm$ 2.7	<0.001*
Attitude toward breastfeeding			
Before	3.3 $\pm$ 0.7	3.5 $\pm$ 0.4	0.054
After	4.5 $\pm$ 0.4	3.5 $\pm$ 0.5	<0.001*
Self-efficacy for self-management toward breastfeeding			
Before	3.2 $\pm$ 0.4	3.4 $\pm$ 0.4	0.056
After	4.4 $\pm$ 0.2	3.3 $\pm$ 0.5	<0.001*

\*Significant at the P<0.001 level

Table 3

*Mean Scores of Various Topics Related to Women Pregnancy in the Studying Group Before and After Intervention within the Study and Control Groups*

Topics	Experimental group N=40		Control group N=40	
	Mean $\pm$ SD of difference	P value	Mean $\pm$ SD of difference	P value
Knowledge about breastfeeding	10.0 $\pm$ 2.8	<0.001	0.18 $\pm$ 2.2	0.617
Attitude toward breastfeeding	1.2 $\pm$ 0.7	<0.001	0.01 $\pm$ 0.3	0.819
Self-efficacy for self-management toward breastfeeding	1.2 $\pm$ 0.5	<0.001	0.1 $\pm$ 0.3	0.059

## Discussions

This present study showed that KSPES and RSKBT on antenatal education and postnatal support strategies can significantly improve rates of exclusive breastfeeding during the first six months after delivery when compared with only RSKBT. The results of this study provided new information regarding first use of KSPES on exclusive breastfeeding which has been used only in patients with diabetes (Funnell MM, 2005).

World Health Organization (WHO) and other organizations have endorsed the importance of promoting and supporting breastfeeding as the best feeding method used exclusively for at least six months and continued along with complementary feeding for not less than two years of life (World Health Organization, 1982). Similarly, in Thailand, the Ministry of Public Health has supported the importance of at least exclusive breastfeeding and the operational target is making at least 30% of postpartum mothers (Hangchaovanich Y, 2006). However, rates of exclusive breastfeeding in the study group were still lower than the operational target, but higher than the national rates for exclusive breastfeeding (14.5%). The reason may be explained by the use of a standard knowledge of breastfeeding techniques in the national strategies.

Table 4

*Relationship of Breastfeeding Practices during the First 7, 14 Days, 1, 2, 3, 4, 5 and 6 Months Postpartum between the Experimental and Control Groups*

Sample group	Breastfeeding practices			
	EBF N (%)	PDBF N (%)	PBF N (%)	NBF N (%)
<b>7 Days</b>				
Experimental group	37(92.5%)	3 (7.5%)	0	0
Control group	29(76.3%)	3 (7.9%)	2 (5.3%)	4(10.5%)
P value	0.095	1.000	0.234	0.051
<b>14 Days</b>				
Experimental group	33 (82.5%)	5 (12.5%)	2(5.0%)	0
Control group	20 (52.6%)	8 (21.1%)	6(15.8%)	4(10.5%)
P value	0.005*	0.311	0.148	0.051
<b>1 month</b>				
Experimental group	31 (77.5%)	7(17.5%)	2(5.0%)	0
Control group	20 (52.6%)	7(18.4%)	7(18.4%)	4(10.5%)
P value	0.021*	0.915	0.083	0.051
<b>2 months</b>				
Experimental group	25 (62.5%)	10(25.0%)	5(12.5%)	0
Control group	14 (36.8%)	5(13.2%)	5(13.2%)	14(36.8%)
P value	0.023*	0.184	0.93	<0.0001*
<b>3 months</b>				
Experimental group	20 (50.0%)	13(32.5%)	7(17.5%)	0
Control group	13 (34.2%)	4(10.5%)	8(21.1%)	13(34.2%)
P value	0.158	0.018*	0.69	<0.0001*
<b>4 months</b>				
Experimental group	14 (35.0%)	11(27.5%)	10(25.0%)	5(12.5%)
Control group	3(7.9%)	5(13.2%)	10(26.3%)	20(52.6%)
P value	0.008*	0.116	0.894	<0.0001*
<b>5 months</b>				
Experimental group	10(25.0%)	12(30.0%)	10(25.0%)	8(20.0%)
Control group	1(2.6%)	2(5.3%)	10(26.3%)	25(65.8%)
P value	0.012*	0.004*	0.894	<0.0001*
<b>6 month</b>				
Experimental group	8(20.0%)	16(40.0%)	6(15.0%)	10(25.0%)
Control group	0	2(5.3%)	6(15.8%)	30(78.9%)
P value	0.005*	0.0002*	0.923	<0.001*

\*Significant at the P < 0.05

EBF = Exclusive breastfeeding

PDBF = Predominant breastfeeding

PBF = Partial breastfeeding

NBF = No breastfeeding

There have been studies to evaluate the effect of intervention on rates of exclusive breastfeeding. However, the rates of exclusive breastfeeding are not high. Su et al. (2008) performed a randomized controlled trial to evaluate antenatal education and postnatal support strategies for improving rates of exclusive breastfeeding. They found that antenatal breastfeeding education and postnatal lactation support both significantly improve rates of exclusive breastfeeding for up to six months after delivery. Rates of exclusive breastfeeding were 19%, 19%, and 9% in antenatal breastfeeding education, postnatal lactation support and the control group, respectively. Anderson et al (Anderson AK et al, 2005) performed a

randomized trial assessing the efficacy of peer counseling on exclusive breastfeeding in a predominantly Latina low-income community. They found that rates of exclusive breastfeeding throughout the first 3 months were significantly higher for the peer counseling group than the control group (21% vs 1%). Susin et al. (2008) performed a study of paternal inclusion in breastfeeding programs to promote breastfeeding. They found that rates of exclusive breastfeeding at 4 months were higher in the mothers' and fathers' intervention group (16.5% vs 11.1% in the mothers' only intervention group and 5.7% in the control group). The result of the present study shows higher rates of exclusive breastfeeding than previous study (Su LL et al, 2007; Anderson AK et al., 2005; Susin LR et al, 2008).

In the present study, KSPES on antenatal education and postnatal support strategies was more effective than the routine standard knowledge of breastfeeding techniques. This was supported by the mean scores of knowledge about breastfeeding, attitudes towards breastfeeding and self-efficacy for self-management toward breastfeeding after the intervention of the study group which were significantly higher than those after routine standard knowledge of the control group. The mean scores of knowledge about breastfeeding, attitude toward breastfeeding and self-efficacy for self-management toward breastfeeding after intervention were also significantly higher than those before intervention in the study group.

Rates of exclusive breastfeeding at 6 months in present study were 20%. This rate was comparable with the study from Singapore (21.1%) (Foo LL et al, 2005). This rate was higher than the studies without intervention from Laisiriruangrai et al (11.0%) (Laisiriruangrai P et al., 2008) and Wong et al (2%) (Wong EH et al, 2007). The differences of population studied, sample size, geographic location, having intervention or not, as well as the year of survey might be possible explanations for the difference of exclusive breastfeeding rates among these studies.

The strength of this present study was a randomized controlled trial of the KSPES program on antenatal education and postnatal support strategies to improve exclusive breastfeeding during the first six months postpartum, which was first used in the present study. The KSPES program is an effective program or important strategy because it explores for the purpose of formalization, sharing discussion of their knowledge by storytelling, experience by best practice, demonstrating and displaying with thoughts within the pregnant women, in addition to applying the 4 steps of empowerment based on Gibson's theory. Furthermore, postnatal support strategies are also important strategies to follow-up by telephone interview at 7 days until 6month postpartum that motivate and stimulate the mother's behavior and improve rates of exclusive breastfeeding over a longer period. The limitation of this study was that it took a long time period to follow-up. Thus, this study had 11.2% of women who were lost to follow-up.

## **Conclusions**

KSPES with RSKBT (not only KSPES) on antenatal education and postnatal support strategies significantly improved rates of exclusive breastfeeding at 6 months postpartum. These strategies also significantly improved rates of exclusive breastfeeding at 14 days, 1, 2, 4, 5 and 6 months postpartum.

## **Competing Interests**

The authors declared that they had no conflict of interests.

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