EXPERIENTIAL LEARNING WITH EMPOWERMENT STRATEGIES AND SOCIAL SUPPORT IN GRANDMOTHERS TO IMPROVE EXCLUSIVE BREASTFEEDING FOR THE FIRST SIX MONTHS OF THE BABY'S LIFE IN ADOLESCENT MOTHERS

Miss Wilasinee Bootsri

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การเรียนรู้เชิงประสบการณ์ร่วมกับการเสริมสร้างพลังอำนาจและการสนับสนุนทางสังคมของย่ายายต่อการส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างเดียวตลอดระยะเวลา 6 เดือนแรกหลังคลอดในมารดาวัยรุ่น

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วิลาสินี บุตรศรี : การเรียนรู้เชิงประสบการณ์ร่วมกับการเสริมสร้างพลังอำนาจและการสนับสนุนทางสังคมของย่ายายต่อการส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างเดียวตลอดระยะเวลา 6 เดือนแรกหลังคลอดในมารดาวัยรุ่น (EXPERIENTIAL LEARNING WITH EMPOWERMENT STRATEGIES AND SOCIAL SUPPORT IN GRANDMOTHERS TO IMPROVE EXCLUSIVE BREASTFEEDING FOR THE FIRST SIX MONTHS OF THE BABY'S LIFE IN ADOLESCENT MOTHERS) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ศ. นพ. สุรศักดิ์ ฐานีพานิชสกุล, 178 หน้า.

อัตราการเลี้ยงลูกด้วยนมแม่อย่างเดียวในมารดาวัยรุ่นพบต่ำกว่าในมารดาวัยผู้ใหญ่ และในสังคมไทยย่า/ยายมีส่วนสำคัญในการสนับสนุนส่งเสริมการเลี้ยงลูกด้วยนมแม่ งานวิจัยนี้เป็นการให้ความรู้แก่ย่า/ยายเกี่ยวกับการเลี้ยงลูกด้วยนมแม่ ภายใต้กระบวนการเรียนรู้เชิงประสบการณ์ การเสริมสร้างพลังอำนาจ และการสนับสนุนทางสังคม วัตถุประสงค์เพื่อส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างเดียว ส่งเสริมความรู้ ทัศนคติ การปฏิบัติในการเลี้ยงลูกด้วยนมแม่และการรับรู้การสนับสนุนทางสังคมของมารดาวัยรุ่นจากย่า/ยาย การวิจัยเป็นแบบกึ่งทดลอง ทำในโรงพยาบาล 2 แห่ง กลุ่มตัวอย่างคือ มารดาวัยรุ่นคู่กับย่า/ยาย จำนวนทั้งสิ้น 84 คู่ (กลุ่มทดลอง 42 คู่ กลุ่มควบคุม 42 คู่) ใช้การสัมภาษณ์ในการประเมินกลุ่มตัวอย่าง 3 ครั้ง คือ ก่อนทำกลุ่มการเรียนรู้เชิงประสบการณ์ซึ่งมารดาวัยรุ่นมีอายุครรภ์ประมาณ 32 สัปดาห์ หลังคลอดทารกอายุ 2 เดือน และ 6 เดือน วิเคราะห์ข้อมูลโดยใช้สถิติ Fisher's exact test, Chi-square test, Mann-Whitney test, paired t-test, independent t-test และ repeated measure ANOVA ผลการศึกษาพบว่ามารดาวัยรุ่นในกลุ่มทดลองมีอัตราการเลี้ยงลูกด้วยนมแม่อย่างเดียว 6 เดือนอยู่ที่ร้อยละ 28.57 ขณะที่มารดาวัยรุ่นกลุ่มควบคุมอยู่ที่ร้อยละ 4.76 คิดเป็นอัตราส่วนเท่ากับ 6 เท่า ที่มารดาวัยรุ่นในกลุ่มทดลองเลี้ยงลูกด้วยนมแม่อย่างเดียวมากกว่ากลุ่มควบคุม และค่ามัธยฐานระยะเวลาในการเลี้ยงลูกด้วยนมแม่อย่างเดียว 6 เดือน ในกลุ่มทดลองเท่ากับ 90 วัน ในขณะที่กลุ่มควบคุมเท่ากับ 0 วัน (มารดาวัยรุ่นส่วนใหญ่ไม่ได้เลี้ยงลูกด้วยนมแม่อย่างเดียว) นอกจากนี้ยังพบว่า ความรู้ ทัศนคติ การปฏิบัติ และการรับรู้การสนับสนุนทางสังคมของมารดาวัยรุ่น และย่า/ยายในกลุ่มทดลองสูงกว่าในกลุ่มควบคุม ข้อสรุปในการวิจัยคือ การเรียนรู้เชิงประสบการณ์ร่วมกับการเสริมสร้างพลังอำนาจและการสนับสนุนทางสังคมมีความเหมาะสมในการให้ความรู้แก่ย่า/ยาย เพื่อส่งเสริมและสนับสนุนการเลี้ยงลูกด้วยนมแม่

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2559 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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KEYWORDS: EXCLUSIVE BREASTFEEDING / GRANDMOTHERS / ADOLESCENT MOTHERS

WILASINEE BOOTSRI: EXPERIENTIAL LEARNING WITH EMPOWERMENT STRATEGIES AND SOCIAL SUPPORT IN GRANDMOTHERS TO IMPROVE EXCLUSIVE BREASTFEEDING FOR THE FIRST SIX MONTHS OF THE BABY'S LIFE IN ADOLESCENT MOTHERS. ADVISOR: PROF. SURASAK TANEEPANICHSKUL, M.D., 178 pp.

Adolescent mothers have lower rates of exclusive breastfeeding than adult mothers. In Thai society, grandmothers are influential person to promote and support breastfeeding. This study provided grandmothers about breastfeeding knowledge under the process of experiential learning, empowerment strategies and social support. The purpose of this study was to improve the rate and duration of exclusive. A quasi- experiment was implemented in two hospitals with 84 pairs of adolescent mothers and grandmothers (Intervention, n=42 pairs; Control, n= 42 pairs). Assessment was conducted by face to face interview at baseline, 2-, 6-month after delivery. Data were analyzed using Fish's exact test, Chi-square test, Mann-Whitney test, paired t-test, independent t-test and repeated measure ANOVA. The findings revealed that adolescent mothers in the intervention group had the EBF rates 28.57% whereas adolescent mothers in the control group had EBF rates 4.76% and the proportion of EBF between two groups were 6 times. The median of EBF duration in the intervention group was 90 days meanwhile the control group was 0 days because most of them reported that no EBF. Furthermore, the knowledge, attitude, practice regarding breastfeeding and perceived social support of adolescent mothers and grandmothers in the intervention group had higher than the control group. Research suggests that experiential learning with empowerment strategies and social support program is appropriate in educating grandmothers in order to promote and support breastfeeding.

Field of Study: Public Health Student's Signature .....

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ELESSS	Experiential Learning with Empowerment Strategies and Social Support
EBF	Exclusive Breastfeeding
PBF	Predominant Breastfeeding
CF	Complementary Feeding
NBF	No Breastfeeding
ANC	Antenatal care clinic

CHAPTER I
INTRODUCTION

1.1 BACKGROUND AND RATIONALE

Breastfeeding is commonly recognized as the gold standard for infant feeding, as well as being the best means of enhancing the health of both mothers and infants [1]. Breastfeeding is not only an acceptable means of infant feeding, but also represents the first opportunity for a mother to provide her infant with the best possible nourishment, since the nutritional value of infant formula or other foods does not compare to that of breast milk. Breast milk consists of over 200 kinds of easily digestible and highly absorbent nutrients required for physical growth. Breast milk is also the most suitable food for promoting physical development in line with an infant's age. In addition to providing the complete nutrients required by an infant, breast milk enhances the immune system and so helps to reduce the chances of contracting respiratory and gastrointestinal diseases, especially diarrhea [2]. Furthermore, breastfeeding promotes maternal-infant bonding, which can be seen as the foundation of child development due to influencing physical, emotional, and mental maturity [3].

Breastfeeding has many benefits for both mothers and infants. Breastfeeding infants have a lower risk of developing acute infections such as respiratory and gastrointestinal tract infections, dermatitis, otitis media, pneumonia, and sudden infant death syndrome (SIDS) [4, 5]. Later in life, infants who were breastfed have a reduced risk of developing heart disease, diabetes mellitus, allergies, asthma, celiac disease, and obesity [6, 7]. In addition, breast milk can increase infants' Intelligent Quotient (IQ) by 3 to 5 points [8]. Breastfeeding not only offers benefits for infants, but is also beneficial for mothers as, for example, it can bring on uterine contractions after delivery, thereby helping to decrease the risk of postpartum hemorrhage, as well as reducing the risk of postpartum depression during the early postpartum period [9, 10]. The long- term health consequences for mothers who breastfed include a low risk of breast cancer, ovarian cancer, endometrial cancer, cardiovascular disease, diabetes

mellitus, osteoporosis, and obesity [7, 11]. Prior studies have noted that breastfeeding also serves to decrease the likelihood of child abuse and improve parent-infant bonding, parental confidence, and cognitive development [12, 13].

In addition to providing health advantages for infants and mothers, breastfeeding has familial, economic, and social-environmental benefits, since it eliminates the need to spend money on infant formula, as well as reducing the medical costs that would be incurred due to illness resulting from unsafe or unsanitary breast milk substitutes. In developing countries, clean water is not commonly accessible and sanitation remains a problem, so breastfeeding can help infants avoid many infections and gastrointestinal diseases such as diarrhea. These diseases play a significant role in the high child morbidity and mortality rates seen in developing countries [10]. Breastfeeding decreases the environmental burden caused by the production of bottles and formula, as well as decreasing the energy demands related to the production and transportation of artificial feeding products [14].

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that all infants worldwide should be breastfeed exclusively for the first six months of life and, further, that partial breastfeeding combined with an appropriate diet should be implemented until the age of two years or beyond [15]. Exclusive breastfeeding is defined as feeding the infant only breast milk from his/her mother or wet nurse or expressed breast milk, without the addition of any food or drink (including water), with the exception of medicines, vitamins, and mineral supplements [16]. The WHO's member states have endorsed the Global Targets 2025 program, which is intended to improve maternal, infant, and young child nutrition, one of the aims of which is to increase the rate of exclusive breastfeeding during the first six months to at least 50% [17]. Currently, the global rate of exclusive breastfeeding is only about 38% for infants aged 0–6 months [18]. In order to strengthen maternity practice and support breastfeeding, the WHO and UNICEF launched the Baby-Friendly Hospital Initiative (BFHI) in 1992. The BFHI's Ten Steps to Successful Breastfeeding are guidelines intended to promote, protect, and support breastfeeding.

The WHO's fourth Millennium Development Goal (MDG) was to reduce child mortality, with the target being to reduce the mortality rate of children under five by two-thirds by 2015 from the 1990 level, which depends heavily on the prevention and control of pneumonia, diarrhea, and malnutrition [19]. Globally, some 6.9 million children aged under five died in 2011 with 17% and 9% of those deaths attributable to pneumonia and diarrhea, respectively. The WHO promotes four main strategies for reducing the mortality rate, one of which is breastfeeding, particularly exclusive breastfeeding for the first six months of life [17]. Exclusive breastfeeding reduces infant mortality due to reducing the incidence of common childhood illnesses such as pneumonia or diarrhea and facilitating a faster recovery during illness [20]. The health outcomes differ substantially for infants and mothers who formula feed when compared to those who breastfeed. Exclusive breastfeeding for less than six months has been found to contribute to health problems such as colic, diarrhea, enteritis, atopic dermatitis, allergy to cow's milk, and increased rates of respiratory and gastrointestinal tract infections [21]. Indeed, a study conducted in Brazil found that the type of milk used to feed infants constitutes an important risk factor for deaths from diarrhea and respiratory infections. The absence of breastfeeding during the first two months of life led to death from diarrhea being 23.3 times more likely when compared with infants who were breastfed without supplementary milk. Further, infants who were breastfed with no milk supplements and those who were completely weaned were 14.2 and 3.6 times more likely to die from diarrhea and respiratory infections, respectively, while infants who were partially breastfed compared with breastfed without formula were 4.2 and 1.6 times respectively [22]. The systemic review's findings suggest that the exclusive breastfeeding of infants with only breast milk and no other foods or liquids (including water) during the first six months of life has several advantages over exclusive breastfeeding for only 3–4 months of life followed by mixed breastfeeding, including a lower risk of gastrointestinal infection for the infant, as well as the delayed return of menstrual periods and more rapid weight loss for the mother following delivery [23].

Breastfeeding is considered to be a significant means of health promotion for both infants and mothers, and hence it has been included in both national and

international policies. In Thailand, the National Breastfeeding Project began in 1989, with the major aim being to promote postpartum mothers to exclusively breastfeed for the first six months of life and then continue breastfeeding with supplementary food until the age of two years [24]. The main activities involved in the project have been the promotion of the Baby-Friendly Hospital Initiative, the formulation of a code of marketing for breast milk substitutes and related products, and the improvement of legislation concerning maternity leave [24]. Additionally, the Eleventh National Health Development Plan (2012–2016) aims to ensure that at least 50% of babies under six months of age are exclusively breastfed. In 2009, it was found that the rate of exclusive breastfeeding was 29.6%, while in 2012 data from UNICEF Thailand indicated that only around 12.3% of mothers exclusively breastfed their babies for the first six months of life [25] However, the Department of Health has reported that the rate of exclusive breastfeeding has been increased to 47.5%, although it was acknowledged that the national target had still not been met [26].

Although it is well known that exclusive breastfeeding has important benefits for both mothers and infants, the rate of exclusive breastfeeding is still lower than the Thai target due to postpartum mothers only receiving education regarding the benefits and recommended duration of breastfeeding, with no emphasis being placed on the importance of infants being given no water during feeding for a full six months after birth [27]. Breastfeeding will only be truly successful and beneficial for mothers and infants if it is ongoing, especially among vulnerable groups such as mothers with a low level of education, those with a low family income, and adolescent mothers [28]. Indeed, adolescent mothers represent one of the least likely populations to breastfeed; however, they and their infants would arguably gain the most benefit from breastfeeding. In Thailand, the rate of adolescent pregnancy has been increasing, with 16.2%, 16.7%, and 16.6% of infants being born to adolescent mothers in 2010, 2011, and 2012, respectively [29]. These rates are higher than the WHO's aim that the rate of adolescent pregnancy should not to exceed 10%. The national database does not include the rates of exclusive breastfeeding among adolescent mothers. Yet, previous studies have found that adolescent mothers exhibit lower rates of breastfeeding than adult mothers [30-33]. In a study conducted by the Special Supplemental Nutrition

Program for Women, Infants, and Children, researchers found that 95% of adolescents had begun feeding their infants formula by the second week of life [34]. Adolescent mothers may choose not to breastfeed because they are generally unprepared for motherhood and are more likely to experience fluctuating emotions, which causes them to lack sufficient patience to satisfy their infants' demands [35]. Several factors may explain the lower rate of breastfeeding among adolescent mothers, including a relatively low level of education and income, the need to return to school, embarrassment regarding breastfeeding in public, a lack of confidence in their ability to breastfeed, and unease about the actual act of breastfeeding [30, 36-38].

Breastfeeding is not solely the responsibility of postpartum mothers, since they require support from various people such as family members, public health personnel, and community members. Breastfeeding is a cultural practice that takes place within the context of the extended family, which includes both the paternal and maternal grandmothers. Mothers often turn to their infant's grandmother(s) rather than public health personnel for information and support concerning feeding issues, especially as their infants grows [39]. Studies investigating the factors that predict improved rates of breastfeeding have concluded that grandmothers are important to successful breastfeeding because their knowledge, attitudes, and experiences influence mothers' decisions to initiate and continue breastfeeding [40]. Adolescent mothers represent a particularly vulnerable group because they have little experience of child rearing and hence often depend on their infant's grandmother for guidance. Most adolescent mothers are financially and emotionally dependent upon their own parents and thus hesitate to contradict their mother's judgments regarding feeding decisions. They are also commonly inexperienced and insecure about their own beliefs, and they logically turn to their mothers for all kinds of parenting help. Even when the mother does express disagreement, the grandmother often asserts her beliefs. Adolescent mothers typically respect their parents and so look to them for advice, support, and guidance [41]. If a grandmother has not breastfed or else misunderstands the nature of breastfeeding, she may offer advice that reflects experience with water, formula, or semi-solid or solid food, which can undermine a mother's milk supply, as well as her confidence and ability to successfully establish

breastfeeding [42, 43]. A lack of breastfeeding knowledge and experience influences grandmothers' level of support for breastfeeding. Grandmothers who are unaware of the current recommendations concerning exclusive breastfeeding may advocate for the provision of supplements to infants [42]. Grandmothers in Malawi are known to encourage the early introduction of complementary food [44]. while a study conducted in Taiwan found that the duration of breastfeeding is shorter when the grandmother is the primary caregiver [45]. Susina and colleagues (2005) concluded that the abandonment of exclusive breastfeeding was the result of the maternal or paternal grandmother advising the use water, tea, or formula milk [46]. Further, a study conducted in China found a shorter duration of breastfeeding to be associated with having grandparents who reside in the same location [47].

In Thai society, family members pay respect to the elderly and they are obedient to their advice, including recommendations concerning breastfeeding. Buakam (2006) noted that a major reason why most postpartum mothers choose to feed their infants with supplements such as water, formula, and semi-solid or solid food prior to the age of four months is because of advice given by elderly relatives, especially grandmothers who had previous experience of caring for their child [48]. Likewise, Treeyachoat (2003) found that the reason why most mothers did not exclusively breastfeed their infants was because of grandmothers' interference, which resulted in them introducing water and solid food to their child too soon [49]. Decisions regarding feeding are often made by grandmothers based on their belief that complementary foods reduce infants' crying and help them to sleep through the night. It is likely that the grandmothers are passing on their own experiences from 20 to 30 years ago, which are contrary to present recommendations concerning the feeding of infants promoted by public health personnel. Therefore, nursing interventions that aim to promote breastfeeding should not only be targeted at mothers, but also at the sources of social support available for mothers, especially grandmothers. Grandmothers are elderly persons who have knowledge and experience of childcare, and they also have love and attachment for the mothers. Thus, the kind of social support that the mothers receive from the grandmothers is the kind that results from love and attachment, with no conditions or expectations of anything in return.

It is generally accepted that social support is the key factor that influences individuals' behavior and health. Indeed, social support has been used to solve behavioral health problems, both physical and mental. For example, Kaplan et al. examined the effects of social support on health behaviors [50], while Baqutayan identified the effects of social support on the reduction of stress [51]. House's interpretation of the concept of social support consists of four aspects, namely emotional support, appraisal support, informational support, and instrumental support [52]. With regards to breastfeeding, the concept of social support has also been utilized to promote breastfeeding by postpartum mothers. For instance, Maycock et al. (2013) studied how the education and support provided to new fathers help to improve the breastfeeding rate [53]. Their findings showed that the education and support provided to the fathers also effected the mothers' knowledge and attitudes, as well as increasing the breastfeeding rate and reducing the number of infants being fully fed on infant formula. A study conducted in Vietnam concluded that the fathers' level of support was effective not only in significantly changing the knowledge, attitudes, and practices of fathers, but also in increasing the early initiation of breastfeeding and exclusive breastfeeding [54].

A variety of health education interventions have been evaluated in relation to initiating and sustaining breastfeeding. The educational approach utilized in this study is based on experiential learning [55]. The four-stage theory of learning consists of concrete experience, reflective observation, abstract conceptualization, and active experimentation. The processes begin with experience and then proceed through reflection on that experience, leading to activity in a cyclical model. This concept can be applied to breastfeeding. It could therefore be suggested that the sharing of experiences and beliefs concerning breastfeeding becomes an imperative part of the learning process [56]. A prior study regarding breastfeeding and experiential learning concluded that experiential learning served to increase the rate of prolonged breastfeeding [56]. Since the grandmothers have significant experience of caring for their child and breastfeeding, experiential learning is appropriate for this study.

Most educational programs are expert-oriented and lecture-based. Therefore, it is necessary to institute a process that reflects the ability to make decisions and sustain

the provision of care for adolescent mothers who are exclusively breastfeeding. An expert should co-ordinate and facilitates the learning rather than simply instructing the mothers. The aim should be to encourage the participants based on their own needs and help them to determine a solution for themselves. Ultimately, it should be a process of empowerment [57]. The four components of the process of empowerment are discovering reality, critical reflection, taking charge, and holding on. A study conducted by Kang et al. (2008) concluded that empowerment programs help mothers to identify and solve problems by themselves, which can serve to improve breastfeeding rates [58]. Furthermore, an empowerment program has been found to improve the competence and confidence of caregivers [59].

There have been relatively few experimental studies specifically concerning grandmothers' ability to promote exclusive breastfeeding on the part of adolescent mothers during the first six months after delivery. Therefore, the objective of this study was to compare the effectiveness of experiential learning featuring empowerment strategies and grandmothers' support for adolescent mothers with the provision of standard knowledge regarding breastfeeding techniques in terms of the rate of exclusive breastfeeding during the first six months of the baby's life.

Banmi Hospital is located in Lopburi Province, Thailand, and it is a 258-bed general hospital. On the other hand, the 254-bed Inburi Hospital is located in Singburi Province, although it is also a general hospital run by the Ministry of Public Health. The staff of both hospitals have become aware of the value of breastfeeding. Hence, they participate in the assessment of exclusive breastfeeding and the promotion of exclusive breastfeeding for the first six months of life in accordance with the WHO recommendations as well as the provisions of the Eleventh National Health Development Plan (2012–2016). The operational goal of both hospitals was to have at least 50% of postpartum mothers exclusively breastfeeding their infants for at least six months. The number of postpartum adolescent mothers at both hospitals who exclusively breastfed their infants for the first six months has been decreasing, as evidenced by the follow-up of six-month-old babies who were delivered at both hospitals. In the case of Banmi Hospital, just 5.2% of infants were exclusively breastfed for the first six months of life (Social Medicine Department, Banmi hospital

Report, 2012), while at Inburi Hospital the rate was 5% (Social Medicine Department, Inburi hospital Report, 2012). These figures imply that the present plan for encouraging and promoting breastfeeding is not effective in improving the rate of exclusive breastfeeding among postpartum adolescent women.

Therefore, this study was conducted in Banmi Hospital and Inburi Hospital in order to improve the situation. The study used a quasi-experimental design featuring grandmother/adolescent mother dyads to compare the effectiveness of experiential learning with empowerment strategies and social support in improving exclusive breastfeeding during the first six months of the baby's life. The program was developed for grandmothers who had experience of taking care of their child. The instruction focused on extracting each other's experience in order to jointly arrive at an explanation and identify a solution through a case study process. Indeed, the grandmothers already had the potential to raise the infants, and the researcher only provided guidance on what to do or what to avoid, as well as concretizing the concept prior to adoption. The significant difference was the switch away from the routine education provided by the hospital, which is typically only provided to pregnant or postpartum women, with very few relatives taking part. One-way communication was mostly used during the traditional instruction, and there was little practice or sharing of ideas due to both the size of the group of learners and the lack of sufficient health professionals. The program adopted in this study was emphasized for grandmothers, who were typically the key person helping first-time adolescent mothers and providing them with breastfeeding knowledge and practice.

1.2 RESEARCH QUESTIONS

The present study sought to answer the following research questions:

1.2.1 Do the rates of exclusive breastfeeding during the first six months of life differ between adolescent mothers whose grandmothers receive experiential learning with empowerment strategies and social support concerning antenatal education and postnatal support strategies and those who receive only routine knowledge concerning breastfeeding?

1.2.2 Does the experiential learning with empowerment strategies and social support program change the breastfeeding knowledge, attitudes, and practice of the adolescent mothers whose grandmothers participated in the program?

1.2.3 Does the perceived social support for breastfeeding provided to the adolescent mothers by the grandmothers in the experimental group differ from that provided by those in the control group?

1.2.4 Does the experiential learning with empowerment strategies and social support program change the breastfeeding knowledge, attitudes, and practice of the grandmothers?

1.3 RESEARCH OBJECTIVES

1.3.1 General objective

To investigate whether the experiential learning with empowerment strategies and social support program available to grandmothers concerning antenatal education and postnatal support strategies can improve the rates of exclusive breastfeeding during the first six months of the baby's life among adolescent mothers.

1.3.2 Specific objectives

1.3.2.1 To assess the effectiveness of the experiential learning with empowerment strategies and social support program for grandmothers in changing the breastfeeding knowledge of adolescent mothers.

1.3.2.2 To assess the effectiveness of the experiential learning with empowerment strategies and social support program for grandmothers in changing the adolescent mothers' attitudes toward breastfeeding.

1.3.2.3 To assess the effectiveness of the experiential learning with empowerment strategies and social support program for grandmothers in changing the breastfeeding practice of adolescent mothers.

1.3.2.4 To compare the perceived social support offered by grandmothers to adolescent mothers between those adolescent mothers with

grandmothers who participated in the experiential learning with empowerment strategies and social support program and the adolescent mothers whose grandmothers did not participate in the program.

1.3.2.5 To examine the effectiveness of the experiential learning with empowerment strategies and social support program in changing the breastfeeding knowledge of grandmothers.

1.3.2.6 To examine the effectiveness of the experiential learning with empowerment strategies and social support program in changing the grandmothers' attitudes toward breastfeeding.

1.3.2.7 To examine the effectiveness of the experiential learning with empowerment strategies and social support program in changing the breastfeeding practice of grandmothers.

1.4 RESEARCH HYPOTHESES

1.4.1 There will be a significant difference in the rates of exclusive breastfeeding during the first six months of the baby's life between adolescent mothers whose grandmothers participated in the experiential learning with empowerment strategies and social support program and those adolescent mothers with grandmothers who did not participate in the program.

1.4.2 There will be a significant difference in the breastfeeding knowledge of the adolescent mothers between the intervention group and the control group.

1.4.3 There will be a significant difference in the adolescent mothers' attitudes toward breastfeeding between the intervention group and the control group.

1.4.4 There will be a significant difference in the breastfeeding practice of the adolescent mothers between the intervention group and the control group.

1.4.5 There will be a significant difference in the breastfeeding knowledge of the grandmothers between the intervention group and the control group.

1.4.6 There will be a significant difference in the grandmothers' attitudes toward breastfeeding between the intervention group and the control group.

1.4.7 There will be a significant difference in the breastfeeding practice of the grandmothers between the intervention group and the control group.

1.4.8 There will be a significant difference in the perceived social support offered by the grandmothers to the adolescent mothers between those adolescent mothers whose grandmothers participated in the experiential learning with empowerment strategies and social support program and the adolescent mothers whose grandmothers did not participate in the program.

1.4.9 Before and after the intervention, there will be a significant difference in the breastfeeding knowledge and attitudes toward breastfeeding of the adolescent mothers and the grandmothers.

1.5 VARIABLES OF THE STUDY

Independent variables

- Characteristic of the adolescent mothers and grandmothers.

Dependent variables

- The rate and duration of exclusive breastfeeding
- Knowledge regarding breastfeeding
- Attitudes towards breastfeeding
- Practice on breastfeeding
- Perceived social support

1.6 OPERATIONAL DEFINITIONS

1.6.1 **The experiential learning with empowerment strategies and social support program** is defined as the use of experiential learning with empowerment strategies and social support (based on Kolb's, Gibson's, and House's theories,

respectively) on antenatal education and postnatal support strategies in order to improve exclusive breastfeeding practice during the first six months of the baby's life.

1.6.2 **Grandmother** here refers to the mother or mother-in-law of an adolescent mother, that is, a relative of the adolescent mother who exhibits power in relation to the care or administration of that adolescent mothers.

1.6.3 **Adolescent mothers** refers to females who became pregnant when aged 10- to 19-years-old. Women who become pregnant at the age of 19 years and who gave birth at 20-years-old are not defined as adolescent mothers.

1.6.4 **Breastfeeding** [16] is defined as the breast milk intake of the infant. More specify, the types of food or liquid are as follows:

- **Exclusive breastfeeding (EBF)** is defined as feeding the infant only breast milk from his/her mother (or a wet nurse) or expressed breast milk without any food, water, or formula, with the exception of medicines, vitamins, and mineral supplements.

- **Predominant breastfeeding (PBF)** refers to feeding the infant only breast milk or expressed breast milk with water, fruit juice, and sweetened water, but without non-human milk and other food.

- **Complimentary feeding (CF)** refers to feeding the infant with breast milk and complementary food such as solid or semi-solid foods, including non-human milk.

- **No breastfeeding (NBF)** refers to not feeding the infant with breast milk and instead feeding with only formula milk and other foods or liquid.

1.6.5 **The rate of exclusive breastfeeding** is defined as the proportion of infants aged 0–6 months who are fed exclusively with breast milk. It should be noted that using the past 24 hours recall period will cause the proportion of exclusively breastfed infants to be overestimated, since some infants will have been given other liquids in the 24 hours prior to the survey [16].

1.6.6 **The duration of exclusive breastfeeding** is defined as the length of time for which the infant was fed exclusively by breastfeeding.

1.6.7 **Antenatal education** refers to the antenatal breastfeeding education class that includes experiential learning with empowerment strategies and social support, which was created by the researcher in order to promote the behavior of grandmothers regarding exclusive breastfeeding.

1.6.8 **Postnatal support strategies** include three activities during the postpartum period. In the first of the activities, the researcher or a staff member visited the grandmothers within the first few days postpartum to educate them and demonstrate the practice of breastfeeding. The second activity involved the researcher meeting with the grandmothers so as to stimulate exclusive breastfeeding during the second and fourth month at Lactation Clinic. The third activity was the follow-up conducted by a community health volunteer during a home visit at day seven, day 14, the first month after delivery, and the third month by means telephone, as well as by the researcher at the well-baby clinic during the sixth month after delivery. Throughout the process, the researcher was available via the telephone to offer counseling to the grandmothers about any problems with breastfeeding.

1.6.9 **Routine knowledge of breastfeeding** refers to the routine education concerning breastfeeding that was delivered during antenatal care, the intrapartum period, and the postpartum period by means of group discussion. The participants were followed up during a routine visit at day seven, day 14, and the first month after delivery by a community health volunteer, and during the second, fourth, and sixth month at the well-baby clinic. In this study, the researcher educated the adolescent mothers from both groups at the antenatal clinic, while the grandmothers in the control group received education from the staff of the antenatal clinic.

1.6.10 **Perceived social support** refers to the adolescent mothers' perception of the supported provided by the grandmothers. According to House, the perceived support offered during the lactation period includes emotional, appraisal, informational, and instrumental support. In this study, the perceived social support

was measured by a questionnaire [60] and after reviewing the literature on social support [52].

1.6.11 **Breastfeeding knowledge** refers to the grandmothers' ability to understand the benefits of breastfeeding, which she can then teach and suggest to her daughter. Additionally, breastfeeding knowledge is defined as the adolescent mothers' ability to memorize the benefits of breastfeeding, which she can then put into practice. The level of breastfeeding knowledge was measured by a questionnaire constructed by the researcher.

1.6.12 **Attitude toward breastfeeding** refers to the beliefs, feelings, and intention to practice breastfeeding, as measured by a questionnaire constructed by the researcher.

1.6.13 **Breastfeeding practice** refers to the grandmothers' attempts to help and support the adolescent mothers when breastfeeding their infants. Further, breastfeeding practice is defined as the adolescent mothers' activities when breastfeeding their child. Breastfeeding practice was measured by a questionnaire developed by the researcher.

1.7 RESEARCH OUTCOMES

1.7.1 The primary outcome of this study is the determination of the rate and duration of exclusive breastfeeding during the first six months of the baby's life.

1.7.2 The secondary outcome is the determination of the rate of exclusive breastfeeding at day seven, day 14, month one, month two, month three, month four, and month five after giving delivery, as well as the rates of predominant breastfeeding, complementary breastfeeding, and no breastfeeding, the scores for breastfeeding knowledge, the attitudes toward breastfeeding, breastfeeding practices, and the perceived social support.

1.8 EXPECTED OUTCOMES

This research focused on providing an educational program to grandmothers in order to improve the rates of exclusive breastfeeding during the first six months of the baby's life among adolescent mothers so as to improve both the mother's and the baby's quality of life. The results of this study may help health care providers and medical organizations to facilitate the provision of better social support by grandmothers or elder relatives to adolescent mothers.

1.9 CONCEPTUAL FRAMEWORK

This study employed a quasi-experimental research design to determine the effect of experiential learning with empowerment strategies and social support for grandmothers in improving exclusive breastfeeding by adolescent mothers during the first six months of the baby's life when compared to the provision of standard knowledge concerning breastfeeding techniques.

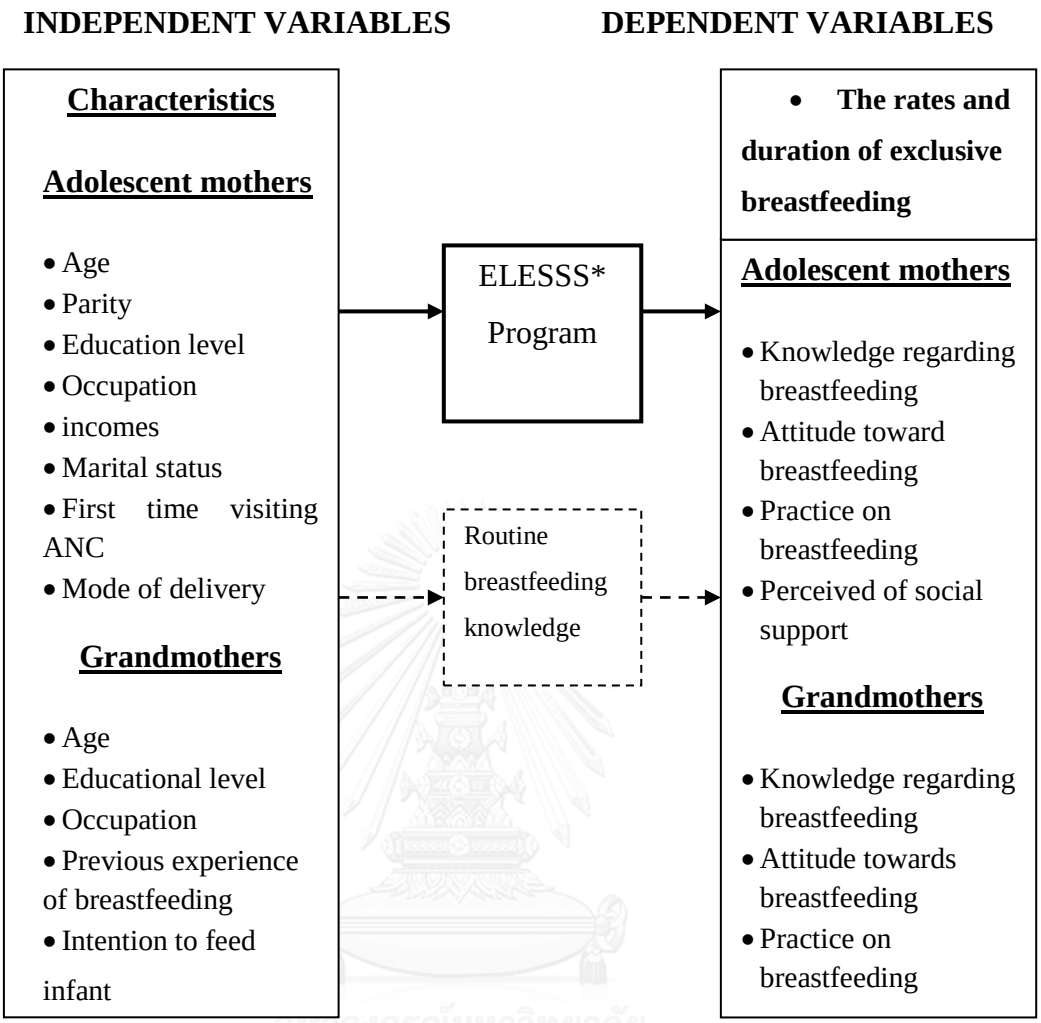

Figure 1: Conceptual framework

*Experiential Learning with Empowerment Strategies and Social Support for promoting exclusive breastfeeding (for grandmothers). The process includes 4 steps of experiential learning and empowerment as follows: Step 1: Concrete experience (Discovering reality). Step 2: Reflective observation (Critical reflection). Step 3: Abstract conceptualization (Taking charge). Step 4: Active experimentation (Holding on). The details are on page 46-58.

CHAPTER II
LITERATURE REVIEW

This research was to investigate whether experiential learning with empowerment strategies and social support program on antenatal education and postnatal support strategies improves the rate of exclusive breastfeeding during the first six months of the baby's life compared with a standard knowledge of breastfeeding techniques. The review of literature includes four sections addressing variables in the study and the relationship to improve exclusive breastfeeding. The first section presents the benefits of breastfeeding, breastfeeding's relation to morbidity and mortality, the differences between breast milk and formula milk, breastfeeding policies, and techniques for successful breastfeeding. The second section focuses breastfeeding among adolescent mothers. The third section addresses the importance of the role grandmothers play in promoting breastfeeding. The last section presents possible strategies for increasing the rate of exclusive breastfeeding.

2.1 BREASTFEEDING

2.1.1 Benefit of breastfeeding

Breastfeeding is the best way to feed an infant, as no food can provide nutritional value as adequately as breast milk. Breastfeeding not only provides optimal nutrition, which leads to improved health; it also improves mother-infant bonding and decreases the risks of child abuse and postpartum depression [4, 9, 13]. The study found that child abuse is 2.6 times more common among formula-fed infants than among breastfed infants [13].

Bonding: Because of the skin-to-skin contact, breastfeeding facilitates bonding and attachment between mothers and infants [12]. Breastfeeding mothers reported a better sense of well-being, greater attachment to their infant, and decreased incidents of child abuse, compared to mothers who did not breastfeed [13].

Skin-to-Skin Contact: Hake-Brook and Anderson (2008) found that preterm infants held skin-to-skin are 15% more likely to be breastfed exclusively than infants held without skin-to-skin contact [61]. According to Bramson et al. (2010), when infants were held skin-to-skin for a minimum of two hours during the first three hours after birth, the exclusive breastfeeding rate increased by 30% during the immediate postpartum period [62].

Postpartum Depression: The study found that postpartum depression can occur in up to 22% of new mothers during the first year after delivery [63]. According to Gallup et al. (2010), the occurrence of postpartum depression was reduced by 50% among mothers who breastfed [64].

2.1.2 Breastfeeding Related to Morbidity and Mortality

***Infant*:** The risk of disease decreases because antibodies pass from mother to infant via breast milk; the benefit depends on the duration of breastfeeding, as well as on whether the infant is breastfed exclusively [65]. Infants who do not breastfeed do not receive the benefits of these antibodies, which help protect against antimicrobial activity, bacteria protozoa, and viruses [7, 66]. During the 2009 H1N1 influenza pandemic, the CDC recommended separation of the breastfeeding and non-breastfeeding pairs to reduce the chances of the infant contracting the virus. However, the infected breastfeeding pairs were encouraged to continue breastfeeding [67].

Morbidity and Mortality: The study by Bartick and Reinhold (2010); Stuebe (2009) reported that formula-fed infants have higher morbidity rates during the first year of life than breastfed infants, and their mortality rates are more than 21% higher [4, 7]. In 2007, the World Health Organization (WHO) found that more than two million infants worldwide die within the first 24 hours of birth every year; another four million die within the first 28 days of life, and the majority of these deaths are related to infectious diseases like pneumonia and diarrhea, which often result from suboptimal feeding practices [68]. According to Black et al. (2008); Lamberti et al. (2011) the majority of neonatal deaths can be prevented by exclusively breastfeeding infant for six months [68, 69].

Otitis Media: The study found that more than 95% of formula-fed infants younger than six months are treated for otitis media every year, while less than 44% of infants that are exclusively breastfed for at least three months develop otitis media [7, 70].

Gastrointestinal: Nearly all formula-fed infants develop diarrhea and vomiting during the first year of life [70]. Lamberti et al. (2011) reported that of all diseases, diarrhea is the second leading cause of death in children between birth and five years of age [69].

Sudden Infant Death Syndrome: The study found that suboptimal breastfeeding has contributed to 350–450 cases of infant deaths [4, 71]. According to Vennemann et al. (2009); Hauck et al. (2011) reported that the risk of sudden infant death syndrome is decreased by approximately 50% in infants exclusively breastfed for a minimum of six months [71, 72].

Respiratory Infections: Bartick and Reinhold (2010) reported that every year, approximately 90,000 formula-fed infants in the United States are hospitalized with respiratory infections and pneumonia, and approximately 192 infants die from complications of respiratory illness related to suboptimal breastfeeding [4].

Mother; Stuebe (2009) noted that maternal health consequences related to suboptimal breastfeeding include increased risks of ovarian cancer, breast cancer, type 2 diabetes and coronary artery disease and lifetime breastfeeding benefits are an accumulation of breastfeeding duration [7].

Ovarian Cancer: Ovarian cancer is the fifth leading cause of death among women. Approximately 21,880 women are diagnosed annually, and approximately 13,850 women die from it annually [73, 74]. Jordan et al. (2010) indicated that epithelial ovarian cancer is linked to two different etiologies: the first involves the recurrent breakdown and repair of the epithelium of the ovaries due to ovulation, and the second involves the high level of circulating gonadotropins on the epithelium of the ovaries [75]. Jordan et al. (2010) reported that exclusive breastfeeding inhibits ovulation and suppresses luteinizing hormones [75] . According to Stuebe (2009),

women who have never breastfed are 1.3 to 1.5 more likely to develop ovarian cancer than women who have breastfed for more than a total of 18 months [7]. The risk of ovarian cancer deceases 1% for each month a mother breastfeeds [74].

Breast Cancer: Breast cancer is the most common cancer and the second leading cause of death among women. More than 23,000 women are diagnosed annually, and approximately 39,520 women die from it annually [73]. The risk of developing breast cancer, as it relates to a woman's breastfeeding history, is based on the length of time she has breastfed. For women who have breastfed for a total of 24 months, the risk of developing breast cancer is decreased by 87.4%. For women who have breastfed for a total of 12–24 months, the risk of developing breast cancer is decreased by only 66.3% [76]. Women who have never breastfed and have a family history of breast cancer face a 50% higher chance of developing breast cancer [77].

Type 2 Diabetes: Type 2 diabetes is one of the fastest-growing chronic illnesses, and more than one million people are diagnosed annually. Furthermore, 35% of people younger than 20 are considered pre-diabetic [78]. Studies have found a longer duration of lactation to be associated with a lower incidence of type 2 diabetes [6, 79, 80]. According to Stuebe (2005), the risk of developing type 2 diabetes can be reduced, not based on lifetime breastfeeding duration, but on the length of breastfeeding for each child. Women who have breastfed one child for more than one year have a 44% decreased risk of type 2 diabetes, whereas women who have breastfed two children for a combined total of at least one year reduce their risk for developing type 2 diabetes by 24% [6].

Cardiac Disease: The Center for Disease Control (CDC) stated that cardiac disease causes one in four deaths among women [81]. Breastfeeding reduces the risks of cardiac disease, hypertension, and hyperlipidemia in women who have a cumulative lifetime breastfeeding history of at least one year [82]. Women who breastfed for at least one cumulative year reduced their risk of developing hyperlipidemia by 12.3% and hypertension by 38.6%, while women who breastfed for more than two years reduced their risk of cardiovascular disease by 37% [82, 83].

2.1.3 Breast milk versus Formula milk

Historically, infants were breastfed until in the mid-1860s. Then, Henry Nestle developed the first commercial infant formula, which was made with cow's milk, malt, wheat flour, and sugar [84]. Studies have shown that infant mortality and morbidity rates increased as breastfeeding rates decreased [4, 7]. The studies indicated that formula milk does not have all of the essential elements required to meet infants' nutrition needs [85-87].

Breast milk: Breastfeeding provides the optimal nutrition for infants, leading to lower mortality and morbidity rates, lifelong health benefits, improved mother-infant bonding, and higher cognitive functioning [7, 9, 65]. Breast milk is species-specific; thus, a mother's breast milk is designed to meet the needs of each individual infant sharing at least 50% of her genetic material [88]. The infant will receive colostrum during the first 3–5 days after birth. Colostrum, which is higher in protein and minerals and lower in lactose and fat, provides the infant with nutrition and protects the gastrointestinal lining from absorbing pathogens, and thus acts as a laxative to clear meconium from the gastrointestinal tract [89].

Fat makes up approximately half the calories in breast milk, and the majority of the long-chain polyunsaturated fatty acids are decosahexaenoic acid (DHA) and arachindonic acid (AA), which support neurological and vision development. Exclusively breastfed infants have higher cholesterol levels compared to formula-fed infants, which is associated with lower cholesterol levels in adulthood [11, 90]. Proteins in breast milk are easily digested and have a higher rate of absorption than formula milk [11, 90]. Taurine and lactoferrin, proteins found only in breast milk, promote brain and retina development and the transport and absorption of iron, respectively [89]. The primary carbohydrate in breast milk is lactose, which enhances calcium absorption and quickly metabolizes into galactose and glucose to supply energy to the brain [88]. Breast milk has growth factors, anti-allergen factors, antibodies, hormones, anti-viral properties, and anti-parasite factors, which promote health and well-being in breastfed infants by decreasing gastroenteritis, lower respiratory tract infections, and otitis media [4, 70, 88]. Breast milk changes over time and adjusts to meet the infant' development needs for optimal growth [88].

Formula milk: Formula milk has similar ingredients to breast milk, including carbohydrates, fats, water, vitamins, and minerals, such as calcium and iron. The protein in formula milk comes from bovine milk. Synthetic AA and DHA are added to formula milk to support neurological and vision development; however, studies related to the effects AA and DHA found no benefit from adding synthetic AA and DHA to formula milk [86, 87]. Formula milk can lead to feeding intolerances related to allergies to bovine proteins. Infants with feeding intolerances can develop gas, diarrhea, and atopic dermatitis [86]. Formula milk has a consistent smell and taste, whereas breast milk has a different smell and taste based on the mother's diet [91]. Formula milk is missing several essential elements for total infant nutrition, including growth factors, antibodies, enzymes hormones, and protection against allergies, viruses, and parasites [87].

Since 1982, the Food and Drug Administration (FDA) has recalled more than 32 batches of infant formula in the United States due to health and safety problems, such as generally unsanitary factory conditions, contamination from dangerous bacteria, glass particles, or high magnesium levels. Fortified formula milk has been recalled for having insufficient amounts of iron and vitamin C [87, 92]. The FDA classified these recalls as potentially life-threatening. Formula milk is associated with other problems as well. In China, spurious formula milk led to the deaths of 50 infants in 2004 and 6 infants in 2008. Additionally, 300,000 infants in China developed kidney stones from formula milk contaminated with melamine [93, 94]. Most recently, in August 2013, a New Zealand formula company announced that some of its whey contained a bacteria that can cause botulism, which can cause nausea, vomiting, diarrhea, paralysis, or even death [95].

Table 1: Comparison Breast milk and Formula milk

Breast milk	**Formula milk**
Water	Water
Protein	Protein
Carbohydrate	Carbohydrate
DHA/ ARA	Synthetic DHA/ ARA
Fat	Fat

Breast milk	Formula milk
Vitamins	Vitamins
Mineral	Mineral
Enzymes	Not applicable
Growth Factors	Not applicable
Anti-Parasite	Not applicable
Anti-Allergies	Not applicable
Anti- Viruses	Not applicable
Hormones	Not applicable
Antibodies	Not applicable

Sourse: California Department of Public Health. [96]

2.2 BREASTFEEDING POLICY

WHO and the United Nations International Children's Emergency Fund (UNICEF) promote the spread of breastfeeding throughout the world by establishing incentives for countries to encourage exclusive breastfeeding for the first six months of life, as well as partial breastfeeding combined with an appropriate diet until at least the age of two. These organizations established the Ten Steps to Successful Breastfeeding policy in 1989 as guidelines for prenatal, delivery, and postpartum care for hospitals and public health care providers. According to these guidelines, mothers should be encouraged to take care of their infants by protecting, promoting, and supporting breastfeeding. In addition, the Baby-Friendly Hospital Initiative (BFHI) was established in 1992. Hospitals participating in this program are required to emphasize the needs of the children and help mothers breastfeed their babies, using the Ten Steps to Successful Breastfeeding policy as criteria for care. In Thailand, the Ten Steps to Successful Breastfeeding policy has been used as operational criteria as a way to promote breastfeeding since 1991. According to these criteria, hospitals are required to:

1. Have a written breastfeeding policy that is routinely communicated to all health staff.
2. Provide training to all health staff in the skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Encourage mothers to initiate breastfeeding within half an hour of birth.
5. Show mothers how to breastfeed and maintain lactation, even if they mustbe separated from their infants.
6. Give breast milk only to newborn infants, unless medically indicated.
7. Practice rooming-in, which allows mothers and their babies to live together 24 hours per day.
8. Promote breastfeeding on demand.
9. Refrain from providing artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Promote the establishment of breastfeeding support groups and refer mothers to them upon discharge from the hospital or clinic.

Source: (Naylor, 2001). [97]

2.3 TECHNIQUE FOR SUCCESSFUL BREASTFEEDING

For successful breastfeeding, remember the three suckling techniques.

Early suckling

Early suckling means immediate breastfeeding, at the soonest time that infants are able to breastfeed. WHO and UNICEF have suggested breastfeeding as soon as possible, or within half an hour after delivery, because at this stage, active infants are most alert. Thereafter, infants will be alert for another 1–2 hours; thus, early suckling promotes the suckling reflex. Furthermore, a suckling infant stimulates the production of the hormone prolactin, which sends a hormonal message to the mother’s body to produce more milk. Thus, early suckling also stimulates early milk release. Moreover,

the first few hours after delivery constitute a sensitive maternal period, and during this period the mother and infant should attach closely through breastfeeding to support attachment and bonding.

Frequent feeding

Frequent feeding means the infants should be permitted to suck freely at the breast without any fixed timetable. Therefore, the mother and infant should be together, facilitated by "rooming-in." Frequent suckling stimulates lactation, as the production of the prolactin hormone is released into the blood circulation at high, constant levels. When infants begin to suckle, the level of prolactin gradually rises to the highest level within 10–60 minutes before gradually decreasing to normal level, usually within three hours. Prolactin levels fluctuate in this pattern in response to infant suckling at each meal; therefore, regular suckling at intervals of at least every 2–3 hours are essential for the constant release of prolactin. Regular lactation is achieved as the lactiferous ducts open regularly to release breast milk, relieving breast engorgement in the first few days after delivery. Infants should be breastfed every 2–3 hours, or at least nine times per day, to stimulate large amounts of milk. Moreover, frequent feeding helps reduce jaundice in infants, as the colostrum acts as a natural laxative, which aids in the excretion of meconium and thus results in the reduction of jaundice.

Correct suckling

Correct suckling is crucial to avoiding breastfeeding failure. Incorrect suckling, which usually occurs when the infant is latched on improperly, can cause insufficient milk supply, delayed milk, slow infant weight gain, sore nipples, or cracked nipples. The following tips may be offered to mothers to promote correct suckling:

- Train mothers hold infants properly prior to breastfeeding. Mothers should sit or lie down in their choice of the most comfortable position. If a mother chooses to sit, the infant should be held with a pillow or cushion supporting the mother's arm and hand, so that the infant's mouth is at the same level as the mother's nipple. The

infant's face and body should be tilted at a right angle to the nipple, and the level of the infant's body and head should be slightly raised, while the head is at the same level as the body or slightly bent to relax swallowing muscles and facilitate swallowing. The infant's head should not extend backward.

- The mother should hold the breast with the thumb on top, and the other four fingers should provide support under the breast. The mother should use the nipple to lightly brush the infants' lower lip until it opens its mouth to latch onto the nipple. While the infant's mouth is opened wide, quickly move its head to the breast. The mother must hold the infant close to her body, with the infant's stomach close to her own, and at the same time insert the nipple into the infant's mouth as deeply as possible until its gum is on the areola, and its mouth covers the whole areola. The infant's mouth should conceal the nipple tightly. The nipple will be stretched out between the infant's palate and tongue. The tongue will move in a wavy rhythm from front to back, and the gum will press the areola on top of the lactiferous duct to draw out the milk to the bottom of the infant's tongue. The infant will receive a large and continuous flow of milk. In case the infant's mouth fails to latch onto the nipple deeply enough, the gum will press on the nipple, and the infant will forcefully lick the front of the nipple, resulting in cracked or sore nipples. Thus, correct latching onto the breast and correct suckling will provide infants with sufficient amounts of milk. The infant should get both fore milk, which is the milk that comes out first and includes water-soluble vitamins, carbohydrates, and proteins, and hind milk, which has a higher fat content; which mother notice that the emptier breast while the infant is suckling. To most easily ensure that an infant gets enough fatty hind milk, the mother should breastfeed only one side during a feeding and switch to the other breast only after the infant becomes hungry again. If the infant gets a higher-calorie meal, the infant will be more satisfied and less fussy between feedings.

2.4 ADOLESCENT BREASTFEEDING

Infants of adolescent mothers face a significantly higher risk of infant morbidity, mortality, and developmental delays due to a variety of social and economic problems [98]. Infants born to adolescent mothers are more likely to be

premature, small for their gestational age, and at risk for less-than-optimal mother-infant bonding. Studies have shown that breastfeeding greatly combats these problems by helping to promote mother-infant closeness and providing the appropriate micronutrients, as breast milk is the most suitable food for infants [99].

However, adolescent mothers are less likely to breastfeed than adult mothers [100]. According to the CDC, less than 60% of adolescent mothers initiate breastfeeding at birth, and only 19% continue to breastfeed past three months [101]. The majority of adolescent mothers who initiate breastfeeding tend to breastfeed for less than a week [102]. Lower breastfeeding rates among adolescent mothers are attributed to lack of knowledge, lack of social support, embarrassment, breastfeeding difficulties, lack of professional support, and lack of exposure to breastfeeding [31, 99]. The breastfeeding decision-making process for adolescent mothers is based on their knowledge, attitudes, social support, professional support, and prior exposure to breastfeeding [98, 99, 102, 103]. The study found that adolescent mothers feel unnecessary pressure to make breastfeeding decisions based on the preferences of family and friends [102]. Early introduction to formula milk and complementary foods are associated with low maternal age, low education, low family income, maternal employment, and primiparity. The research found that adolescent mothers are particularly susceptible to introducing their infants to non-breast milk early on, and that the infants' grandmothers commonly influence this behavior [104].

According to Mossman (2008), adolescent mothers with positive attitudes and higher confidence levels were more likely to exclusively breastfeeding for longer durations than adolescent mothers with lower confidence levels [98]. Gile et al. (2010) found that adolescents who had been breastfed themselves and had thus been exposed to breastfeeding role models produced more positive breastfeeding attitudes, leading to an increased likelihood to initiate breastfeeding [105]. Swanson et al. (2005) studied the impact of knowledge and social influences on adolescent mothers' breastfeeding beliefs and intentions and recommended interventions aimed at enhancing breastfeeding rates [106]. Wambach and Cohen (2009) showed that adolescent mothers with lower confidence levels need additional support and confidence-building interventions during the immediate postpartum period [102].

Furthermore, Tucker, Wilson, and Samandari (2011) found that in the part of quantitative, common barriers breastfeeding initiation and continuation included not linking breastfeeding, insufficient milk, nipple pain and return to school; in their study, qualitative data provided the context for quantitative findings, explaining the barriers and facilitators to breastfeeding from the adolescent's perspective and insight into the ways in which breastfeeding support to adolescent could be enhanced [107].

2.5 GRANDMOTHER'S ROLE IN BREASTFEEDING

Grandmothers' experiences regarding infant feeding practices influence adolescent mothers' decisions to initiate and continue breastfeeding. Grandmothers who breastfed impart not only their practical knowledge of how to breastfeed, but also their confidence that breastfeeding is the normal way to feed infants. The more the mother's family members and friends breastfeed, the more confident the mother is in her breastfeeding ability [30]. If the grandmother has no breastfeeding experience, she may offer advice based on experiences with bottle-feeding, water, and semi-solid and solid food before six months after birth and thus undermine her daughter's ability and confidence to successfully establish breastfeeding. The study showed that grandmothers who had not breastfed or who had limited knowledge of breastfeeding approached their daughter's decisions to breastfeed in one of two ways: they either did not oppose breastfeeding, even though they were unable to offer practical support, or they were described by their daughters as unsupportive because they either tried to dissuade them from breastfeeding or quickly recommended feeding the infants formula milk when breastfeeding was not going well [43]. Whether the adolescent mothers disagreed with exclusive breastfeeding or wanted to try feeding their infants only breast milk, they were most often interrupted in their efforts to exclusively breastfeed by older women. These older women felt that respecting their views about child care and feeding decisions would help the young mothers maintain their children's health. Many women expressed frustration with the exclusive breastfeeding policy and felt that they had to appear to comply with hospital policies in order to obtain hospital services [108]. According to Tarrant et al. (2002), contextual factors influencing women's breastfeeding in Hong Kong included lack of experience and

breastfeeding knowledge and limited support from female family members. These female family members often advised the new mothers to supplement breastfeeding with formula milk, solid-semi solid food, and water when a problem occurred [109]. Susin et al. (2005) studied the influence of grandmothers on breastfeeding practice in Brazil and found that daily contact with a maternal grandmother increased the risk of early supplementation with formula milk, water, and tea, as well as early abandonment of exclusive breastfeeding [46]. Grassley and Eschiti (2008) examined what new mothers needed and wanted from their own mothers regarding breastfeeding practices and concluded that they wanted their mothers to act as their advocates, affirm and value their decisions to breastfeed, understand and trust the breastfeeding process, and offer loving encouragement when they experienced difficulties, without pressuring them to supplement feeding with other kinds of milk, water, or additional foods [42]. The grandmothers were shown to change their beliefs about breastfeeding when information was presented in culturally appropriate ways that acknowledged their perspectives [108]. Grassley and Eschiti (2008) concluded that breastfeeding is a cultural practice that takes place within the context of an extended family. Grandmothers support new mothers with their own knowledge of infant feeding practices and beliefs and sometimes do not encourage breastfeeding. Including grandmothers in conversations about breastfeeding practices can help enhance their knowledge about and support of breastfeeding [42].

2.6 POSSIBLE STRATEGIES TO INCREASE EXCLUSIVE BREASTFEEDING

2.6.1 Gibson's theory of empowerment

Power includes an individual's capabilities, control, and decision-making authority. Each individual has the power to vary depending on recognizing the power of the individual. Empowerment has been defined as follows:

Rappaport (1987) stated that empowerment is the process through which people, organizations, and communities gain control over their lives [110].

Kieffer (1984) stated that empowerment is the process of helping individuals who have lost the power to recognize real problems and solve their own problems [111].

Gibson (1991) defined empowerment as a social process that encourages people to discover and manage their problems and needs on their own, using resources as necessary to feel they are in control of their own lives [57].

Briefly, empowerment is a powerful individual force through which people discover their own needs and develop the skills and self-confidence they need to solve their own problems; health care providers can facilitate and provide support throughout this process.

Furthermore, Gibson outlined basic tenants for the process of empowerment:

1. Health belongs to the individual and, thus, people must be responsible for their own health. Although health care providers promote health care, they do not have the power to dominate others, and they should respect the human right to health care.

2. People should be respected to the potential individuals for developing and responding to their own needs and decision making, although it may have to rely on helping from others about information and support.

3. A health care provider cannot empower an individual, but he or she can support and encourage the individual to develop the skills he or she need to maintain good health and use resources to boost their sense of control and confidence in their own abilities.

4. The health care provider recognizes the importance of the community's cooperation. The individuals are felt free to make their own decisions; they choose may be different; so the author should be accepted.

5. The process of empowerment can be achieved when mutual respect occurs between the health care provider and the individual.

6. There must be mutual trust.

According to Gibson's concept, the characteristics of an empowered individual consist of the commitment, the bond, the love of them to the issue, and the factors related to the process of empowerment include the individual's beliefs, values, experiences, social support, and determination. Frustration can lead to the steps of the process of empowerment, and the process of empowerment can be divisive.

1. Intrapersonal factors

1.1 Values: Loving yourself means committing to the fundamental responsibility of taking care of yourself.

1.2 Beliefs: Beliefs help an individual manage problems or obstacles. which the good beliefs with efficiency nursing helping the patient get well from the disease. These beliefs can be made a hopeful future and it helps the individual to beliefs that can able to care themselves.

1.3 Determination: The person has the strength and motivation to act towards a goal.

1.4 Experience: Past experience is important in how a person manages and exerts control in a given situation.

2. Interpersonal factors

2.1 Social Support: Family members, health care providers, and community members help mothers develop confidence and find empowerment by sharing information and experiences and providing access to community services.

The researcher chose to apply Gibson's theory of empowerment in this study because it conceptualizes empowerment as the social process of promoting, recognizing, and enhancing people's abilities to meet their own needs, solve their own problems, and utilize resources in order to feel in control of their own lives. Through this process, health care providers and help people take control over factors that affect their health. Gibson's theory comprises four steps, which are listed below:

1. Discovering Reality: Discovering reality is the first stage of the empowerment process in which a person tries to realize and accept the crucial aspects of the situation. This stage can be divided into three parts.

1.1 Emotional Responses: When the person realizes and accepts the problem, they may then be confused, hesitate, resist, or become worried because they do not understand the problem or how to fix it. However, this situation will improve if the individual changes her thoughts and believes she can do it. This notion will help her discover the reality of the problem and learn how to take care of herself properly.

1.2 Cognitive Responses: When a person loses the ability or self-confidence to care for herself, she will seek assistance by enhancing her knowledge from various sources, including textbooks, journals, advice from health care personnel, and advice from others who have experienced similar situations, and then use this information to make decisions and solve the problem.

1.3 Behavioral Responses: When a person accepts and realizes that taking care of herself is her own responsibility. The best thing that can be done is to understand the problem, the situation, and the needs, and then use both old and new experiences to address them.

The grandmothers responded emotionally by accepting and understanding the current knowledge regarding the importance of exclusive breastfeeding. They then sought out information in order to understand the situation; this is a cognitive response. As for their behavioral response, after accepting and understanding the current knowledge of breastfeeding, the grandmothers developed positive attitudes towards exclusive breastfeeding and promoted it to adolescent mothers.

2. Critical Reflection: In this step, the person carefully considers the incident and how to manage the problem and make the proper decisions. This stage is necessary for the individual to be able to proactively take charge of the situation and develop a sense of empowerment. At this stage in the process, the grandmothers reviewed their knowledge of and the myths they believe in regarding breastfeeding and decide to promote exclusive breastfeeding. Through this step of critical reflection, the grandmothers became aware of their strengths, abilities, and resources.

3. Taking Charge: The person will choose the methods that help them best develop confidence in their abilities and sense of empowerment. There were several

dynamics at play here: (1) advocating for them, whereby the grandmothers saw themselves as an advocate for their daughters and grandchild because their daughters and grandchild were so dependent upon them for care; (2) learning the ropes, whereby the grandmothers had breastfeeding experience and found that if they encountered problems, they could access health services; (3) learning to persist, whereby the grandmothers relentlessly continued to assert themselves and advocate for their daughter and grandchild; (4) driving negotiation in health care, whereby the grandmothers were the driving force for negotiations with a health care provider because they firmly believed they knew what was best for their daughter; and (5) establishing partnerships, whereby the grandmothers wanted to partner with the health care team, though for this to occur, the grandmothers needed up-to-date information concerning exclusive breastfeeding. The keys to successful partnerships were mutual respect and open communication between the grandmothers and health care providers. Once the grandmothers were aware of their strengths and confident in their knowledge of exclusive breastfeeding, they took charge of the situation.

4. Holding On: Holding on as a result of their awareness of their strengths, capabilities, and competencies, the grandmothers were able to maintain their own sense of power, even during shifting circumstances. The grandmothers developed a sense of personal control in terms of regulating their own responses.

Research related to the application of empowerment can be illustrated as follows. Kang et al. (2008) conducted a quasi-experimental study of postpartum mothers to examine the effects of a breastfeeding empowerment program. They found that empowerment helped the mothers identify and solve problems by themselves and increased breastfeeding rates [58]. Yunmi (2009) studied the effects of a breastfeeding empowerment program on exclusive breastfeeding before delivery and four months after birth. The results indicated that empowerment raised awareness and strengthened the mothers' skills and knowledge regarding exclusive breastfeeding [112]. Saeui et al. (2009) conducted a study of 30 caregivers for children with acute leukemia to evaluate the effects of an empowerment program. The studied revealed that an empowerment program increased caregivers' knowledge and competence in caring for preschool-aged children [59].

2.6.2 Social Support

Weiss (1974) defined social support as having six dimensions: (1) attachment or intimacy, or the sense of security that one receives from his/her social network; (2) social integration, or the opportunity to share concerns and exchange services; (3) nurturance, or the support a person provides to others; (4) reassurance of worth, or the sense of being valued as an individual; (5) reliable alliance with bloodline kin; and (6) the availability of guidance, or the emotional and informational support that one receives for reappraisal of the situation [113].

Cobb (1979) defined social support as the information leading a person to believe that he/she is cared for, loved, valued, esteemed, and part of a network of communication and mutual obligation [114].

Gottlieb (1978) defined social support as comprising four different helping behaviors: (1) emotionally sustaining behaviors, (2) problem-solving behaviors, (3) indirect personal influence, and (4) environmental action [115].

Kahn and Antonucci (1980) defined social support as interpersonal transactions including at include one or more of the following: affection (love, admiration, respect, or liking); affirmation (expression of agreement or acknowledgement of others' ideas); or aid (giving of money, things, time, or information) [116].

House (1981) viewed social support as having four components: emotional support (esteem, trust, concern, affection, and listening); appraisal support (affirmation, feedback, and social composition); information support (advice, suggestions, and directions); and instrumental support (aid in-kind, money, time, labor, and environment modifications) [52].

The definition of social support varies according to different scholars, but it generally has three aspects: (1) psychological support, including affection, admiration, affirmation, and perception of belonging to a group; (2) the availability of guidance or information support, comprising advice, suggestions, and information for problem-solving; and (3) assistance in the form of money, goods, time, and services. The goal

of social support is to reduce stress and benefit the health and well-being of people. In this study, House's (1981) definition of social support is used because it addresses the basic needs of adolescent mothers. Adolescent mothers in this study have never breastfed, and caring for their infant is a new experience for them. The function of social support, within the scope of this research, is to help adolescent mothers cope with breastfeeding tasks and stresses occurring during the lactation period.

House (1981) defines four components of social support:

1. Emotional Support: Emotional support, including trust, concern, and empathy, was identified as essential to facilitating adolescents' breastfeeding experience [52]. The study noted that most adolescent mothers experienced some issues initiating breastfeeding and benefited from having someone take the time to listen to their concerns [102, 117]. Adolescent mothers were influenced by their family and their culture, and they needed to feel cared for by their family, especially their mothers and partners [31]. The case study program encouraged the grandmothers to provide emotional support to the adolescent mothers by showing their attention, encouragement, concern, and compliments to the adolescent mothers in their efforts to breastfeed their infants. They also listened to the adolescent mothers and helped them take care of their infants to demonstrate love and care for both the adolescent mothers and the infants. As a consequence, the adolescent mothers felt valued, secure, and self-confident. When the adolescent mothers had no emotional conflicts, they were able to correctly initiate and continue breastfeeding their children. After the grandmothers participated in the experiential learning program, with included empowerment strategies and social support programs, they were able to adjust their ideas about breastfeeding. They began to understand the psychological needs of adolescent mothers and realized that their emotional support could reduce stress on the adolescent mothers and help them sustain breastfeeding.

2. Appraisal Support: Appraisal support behaviors are those that offer encouragement through affirmation and feedback and are often the most helpful [118]. Appraisal support can build breastfeeding confidence through affirmation and empowerment, and in this case, through acceptance of the adolescent and validation

of their independence [119]. Mossman et al. (2008) found that breastfeeding confidence was a significant predictor of longer breastfeeding terms, and in their study, 69.5% of adolescent mothers with high breastfeeding confidence were still breastfeeding at 28 days, compared to those with low levels of breastfeeding confidence. In this study, the program encouraged the grandmothers to accept their adolescent mothers' decision to practice, reduce their stress, help them feel more relaxed regarding their childcare and other duties, and provide positive feedback and reinforcement regarding their performance [98]. The support helped the adolescent mothers feel more confident and secure in their breastfeeding efforts.

3. Informational Support: This kind of support is important when helping adolescent mothers breastfeeding [102, 120]. Adolescents tend to have limited knowledge about breastfeeding. Thus, advocates need to provide informational support in the early postpartum period because the adolescent mothers may not have attended a class [100, 121]. Informational support includes advice, directions, and suggestions [52]. The case study program encouraged the grandmothers to offer advice and consultation to the adolescent mothers. They searched for information in books and documents that provided advice and recommendations for how to correctly breastfeed, as well as for how to solve breastfeeding problems. They also sought information on people or agencies providing breastfeeding assistance. After the grandmothers participated in the program, they had the chance to learn about the benefits of breastfeeding, breastfeeding practices, solving breastfeeding problems, and breastfeeding resources, so they were able to offer beneficial and necessary information to the adolescent mothers.

4. Instrumental Support: Instrumental support was identified as essential in supporting adolescent parents [102, 120]. It is important to provide adolescent mothers with practical help when initiating breastfeeding [119]. Adolescent mothers need someone to show them the correct way to latch on and position the infant to help them overcome the fear that breastfeeding will be painful. This program encouraged the grandmothers to provide tangible support to adolescent mothers in term of money, time, and labor—for example, assistance with household chores, child care, and finding necessary things for adolescent mothers and infants. After the grandmothers

participated in the program, they realized the significance of breastfeeding as well as their own role in it, and they were able to offer assistance that directly served the adolescent mothers' needs, thus enhancing their opportunity to breastfeed their infants.

2.6.3 Experiential Learning

Experiential learning is also referred to as learning through action, learning through experience, learning through discovery and exploration, and learning by doing, whereby educators purposefully engage with the person through direct experience and focused reflection to enhance knowledge, develop skills, and clarify values [122].

Learning through experience is not a new concept in higher education. Notable educational psychologists, such as John Dewey (1859–1952), Car Rogers (1902–1987), and David Kolb (b. 1939), have provided the foundational theories for experiential learning. Dewey defined the concept of experiential education as problem-solving and critical thinking, as opposed to memorization and rote learning. Rogers discussed the significance of experiential learning compared to what he called "meaningless" cognitive learning. Kolb stated that concrete learning experiences are critical to meaningful learning. As this notion is widely used across many disciplines today, the present research uses Kolb's experiential learning theory.

Kolb described experiential learning as a four-part process:

1. Concrete Experience: The instructor motivates learners to share their experiences so that they can achieve the benefits of learning together and exchange stories, thereby enhancing the knowledge.

2. Reflective Observation: The instructor brings up an issue for analysis or criticism, and the learners share their thoughts and feelings with the group. During the discussion, the learners can evaluate the different ideas and experiences and reflect on the concept.

3. Abstract Conceptualization: During this stage, learners learn about the content in detail so they can develop the knowledge that they can receive many ways as lecturing of instructor, reflection the concept and discussion of the learners by the instructor summarize to the conceptualization lead to the learner understanding.

4. Active Experimentation: The learners try to apply the conceptualization through various methods—for example, by conversing, roleplaying, or creating slogans.

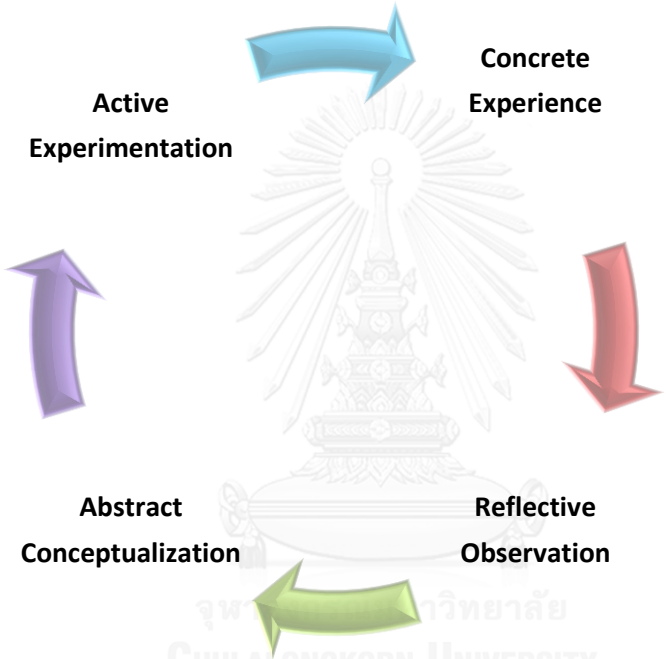

Figure 2: Kolb's Experiential Learning Cycle, 1984

From this figure, a four-stage cycle theory of learning, one may begin at any stage but must follow each other in the sequence. Kolb's experiential learning is a holistic perspective that combines experience, perception, cognition, and behavior. Within the learning theory framework, one may begin at any of the four stages but must follow the sequence.

In this research, no evidence was found to support that grandmothers' experience with experiential learning led to improved exclusive breastfeeding rates among adolescent mothers. Therefore, related interventions were studied. Few studies

on experiential learning and breastfeeding have been conducted. In one study, Reeve et al. (2004) examined 73 primiparous woman's infant feeding choices and their relationship to experiential learning, both at the antenatal clinic and four months after birth. The study found differences between the groups at four months, and experiential learning was found to have increased the rate of prolonged breastfeeding and mothers' self-confidence in their choice.

2.6.4 Antenatal Education

Pregnant women who seek care at the hospital's antenatal clinic of the hospital will be given breastfeeding education, in both individual and group settings, at least twice. The first time, a health care provider will check their breasts and nipples, and any abnormalities will be corrected—for example, by teaching the mother to use Hoffman's maneuver or use breast cups to cover the nipples in case of inverted nipples. During the second session and throughout antenatal care, pregnant women will receive advice regarding the benefits of breastfeeding, the importance of exclusive breastfeeding, the importance of breastfeeding immediately, the disadvantages of formula milk and water, techniques for successful breastfeeding, and ways to make sure infants are breastfed after mothers have to return to school or to work.

2.6.5 Postnatal Support Strategies

Mothers and infants who have no complications after delivery will be sent to the postpartum ward together. There, mothers will be stimulated by nursing staff to breastfeed their infants immediately. In case of a cesarean section, the health care staff will bring the babies to the mothers as soon as they gain consciousness and teach them how to breastfeed their babies. The postpartum ward nurse will also provide advice and recommendations for breastfeeding, including the benefits of breastfeeding, techniques for exclusive breastfeeding, how to express breast milk, feeding with a cup, the disadvantages of formula milk and water, and frequently occurring problems during every day breastfeeding. After discharge from the hospital,

the mothers were provided with follow-up on the 7th and 14th days, as well as after one month, by a home visit from a community health volunteer.

2.7 RELEVANT STUDIES

Nanthakasikorn (2008) examined the effectiveness of computer assisted instruction (CAI) on breastfeeding practice among 50 primiparous adolescent mothers (25 subjects in each group) during the early stage of labor. The study found that the mean score of breastfeeding knowledge and breastfeeding behavior was statistically significantly higher ($p<0.001$) in the intervention group than in the control group [123].

Kupratakul et al. (2010) conducted a randomized controlled trial to examine the effectiveness of knowledge-sharing practices combined with empowerment strategy programs on prenatal and postnatal education provided to pregnant Thai women who began the program around 32 weeks of gestation. The results revealed that the rate of exclusive breastfeeding in the intervention group was higher than in the control group, and the difference was statistically significant ($p=0.005$). In addition, the mean scores of breastfeeding knowledge, attitudes, and self-efficacy for self-management after implementation was higher in the intervention group than in the control group, at a statistically significant level ($p<0.001$) [24].

Yuangthong, Sawatphanit, and Deoisres (2012) studied the effects of a breastfeeding promotion program on breastfeeding duration and behavior among 60 first-time postpartum mothers (30 subjects in each group). They found that at four weeks after delivery, the participants in the intervention group had statistically significant longer exclusive breastfeeding durations than participants in the control group ($p=0.002$). The differences in breastfeeding behaviors between both groups were not statistically significant ($p=0.052$).

Chisuwan et al. (2012) examined the predictive power of support from husbands, grandmothers, and nurses for 77 mothers who took their child for vaccinations at six months. They found that the average exclusive breastfeeding

duration was 90.60±50.10 days. The major reason for weaning infants off breastfeeding was inaccurate advice from grandmothers. However, the instrumental support from grandmothers was predictive for the exclusive breastfeeding duration (p=0.012) [124].

Mekkamol et al. (2013) studied the effects of a breastfeeding promotion program on 30 pairs of mothers and families using a quasi-experimental research design involving a pretest and posttest for a single group. The program was based on family-centered care (Phillips, 1996, 1998) and began after the mothers gave birth; it provided breastfeeding knowledge, decision-making guidance for both breastfeeding and child care in general, and information on the family's role for supporting new mothers. According to the results, the knowledge and attitudes regarding breastfeeding were not significantly different before and after program implementation. The exclusive breastfeeding rate at six months was equal 80% [125].

Phaiboonbunpot (2013) examined the effects of a breastfeeding promotion program on breastfeeding knowledge, attitudes, and skills among 30 postpartum mothers (16 subjects in the intervention group and 14 subjects in the control group). The study results found that at two weeks postpartum, the intervention group had better breastfeeding knowledge, attitudes, and skills, compared to the control group ($p<0.001$). The attitudes toward breastfeeding between the two groups was statistically significant ($p<0.01$). The intervention group had a higher rate of exclusive breastfeeding than the control group, at a statistically significant level ($p<0.01$) [126].

Srisawat, Vichitsukon, and Prasopkittikun (2013) reported on the effects of promoting the grandmothers' role in infant feeding decisions on perceived social support among 50 pairs of grandmothers and first-time mothers who had just given birth (25 subjects in each group). The study found that the mothers in the intervention group perceived greater social support from grandmothers than those in the control group, at a statistically significant level ($p<0.001$). Moreover, mothers in the intervention group were satisfied with their grandmothers' participation in the study [127].

Ratisunthorn, Thaithae, and Bowanthammajak (2014) examined the effects of an empowerment program on breastfeeding behavior and exclusive breastfeeding duration among 60 adolescent mothers (30 participants in each group). They found that breastfeeding behavior scores were statistically higher than they were before implementation in the intervention group that in the control group ($p<0.001$). The exclusive breastfeeding duration in the intervention group was statistically longer than in the control group ($p<0.01$) [128].

Kang, Choi, and Ryu (2008) investigated the effects of a breastfeeding empowerment program among 60 breastfeeding Korean mothers (30 participants in each group). The program was based on Freire's empowerment education model. The program was offered as a series of four 60-minute sessions beginning three days after childbirth and lasting 2–4 weeks after childbirth. The results revealed that the breastfeeding empowerment program significantly raised rates for exclusive breastfeeding rate in the intervention group [58].

Meglio, McDermott, and Klein (2010) conducted a randomized controlled trial of the "telephone peer support" project, which aimed to find the duration of breastfeeding among adolescent mothers. The intervention group included 38 participants, and the control group included 40 participants. Five adolescent mothers who had breastfeeding experience were trained to provide peer support. The program was implemented after each mother was discharged from the hospital, at two, four, and seven days, and then at two, three, four, and five weeks. The study found that the exclusive breastfeeding duration was statistically longer in the intervention group than in the control group (median of 35 days vs. 10 days, $p=0.004$) [129].

Nwosu and Eke (2011) conducted a study on the effects of health promotion among 400 women, who were divided into two intervention and two control groups. The program taught ten steps, including demonstrating the correct sitting position, suckling techniques to ensure proper latching-on, how to initiate baby's first feeding about 30 minutes to an hour after birth, and the importance of colostrum and exclusive breastfeeding (only breast milk without water or glucose solution). They found that the program increased both knowledge about and the practice of exclusive

breastfeeding in the intervention group, whereas these elements showed no change among the control group. The program helped to scale the exclusive breastfeeding rate up to 70% within nine months [130].

Handayani, Kosnin, and Jiar (2012) used a cross-sectional study design to examine the effectiveness of breastfeeding education provided to 221 mothers who had babies age 0–6 months and who had participated in a mother support group (MSG) program. The findings revealed that mothers with high levels of knowledge, attitude, and breastfeeding practice (KAP) exclusively breastfed their babies. Knowledge had a strong effect on breastfeeding practice ($p<0.001$), whereas attitude had a weak influence on breastfeeding practice ($p=0.02$). Employment status was only one factor that influenced breastfeeding practice ($p=0.02$) [131].

Grassley, Spencer, and Law (2012) studied a project called "a grandmother's tea," which examined interventions aimed at facilitating grandmothers' knowledge and support of breastfeeding. There were 26 grandmothers in the intervention group and 23 grandmothers in the control group. The grandmothers' tea program had four components, each lasting about 60 minutes. Grandmothers in the intervention group attended only one part. The results showed that the intervention group had higher posttest knowledge scores than the control group. There was no statistically significant difference between two groups regarding attitude or intent [132].

Oliveira et al. (2014) use a randomized clinical trial to examine counseling sessions attended by 323 adolescent mother and grandmothers. The program provided five counseling sessions at a postpartum unit as well as follow-up. The program increased exclusive breastfeeding duration by 67 days for the intervention group (HR=0.64; CI95%=0.46-0.90) and 46 days for the control group (HR=0.52; CI95%=0.36-0.76) [133].

Ayed (2014) explored KAP regarding exclusive breastfeeding among 600 mothers with children between 6–12 months. The study found that more than half of them (55.3%) had strong breastfeeding knowledge, and 62.2% of them had positive

attitude toward breastfeeding; however, the rate of exclusive breastfeeding was only 7.3% [134] .

Hanafi et al. (2014) studied the effects of health education on 360 women (180 subjects in each group) at 28–30 weeks gestation. The intervention group received 30-minute health education sessions comprising general breastfeeding knowledge, attitudes toward breastfeeding, demonstration and role modeling, and discussion. The results showed the health education program significantly improved breastfeeding KAP [135].

Bich, Hoa, and Malqvist (2014) conducted a quasi-experimental study of fathers as supporters that aimed to determine the rate of exclusive breastfeeding at four and six months after birth. There were 251 couples in the intervention group and 241 couples in the control group. Fathers in the intervention group received breastfeeding education, counseling services, and home visits, while mothers received routine service. The study found that the program increased rate of exclusive breastfeeding at both four and six months, and there were statistically significant differences between two groups at both points ($p<0.01$ and $p<0.001$, respectively) [136] .

Giglia (2015) examined the effects of internet intervention on 414 women, who were divided into one control and one experimental group. The intervention group was provided infant feeding information and website content that they were able to “post” on the discussion board. They were also able to contact a lactation consultant using a webcam. The study found that the participants in the intervention group were more likely than those in the control group to be exclusively breastfeeding at six months [137].

Vijayalakshmi, Susheela, and Mythili (2015) used a cross-sectional study design to explore breastfeeding KAP among mothers at a pediatric outpatient department. The results revealed that through the mothers had acquired sufficient breastfeeding knowledge and maintained a neutral attitude toward breastfeeding, the exclusive breastfeeding rate remained at 27% [138].

CHAPTER III
RESEARCH METHODOLOGY

This chapter describes the methodology used in this study. The description consists of the research design, study area, study period, study population, sampling technique, sample size, intervention program, measurement tools, data collection, data analysis and ethical considerations.

3.1 RESEARCH DESIGN

This study used a quasi-experimental research design with two comparable groups: the intervention group and the control group. The group that received training in Experiential Learning with Empowerment Strategies and Social Support was called the intervention group, while the group that received standard training on breastfeeding techniques was labelled the control group.

This study used two groups pre-test and post-test to evaluate the effectiveness of Experiential Learning with Empowerment Strategies and Social support on antenatal education and postnatal support strategies in grandmothers to improve the rate of exclusive breastfeeding for the first six months after birth in adolescent mothers.

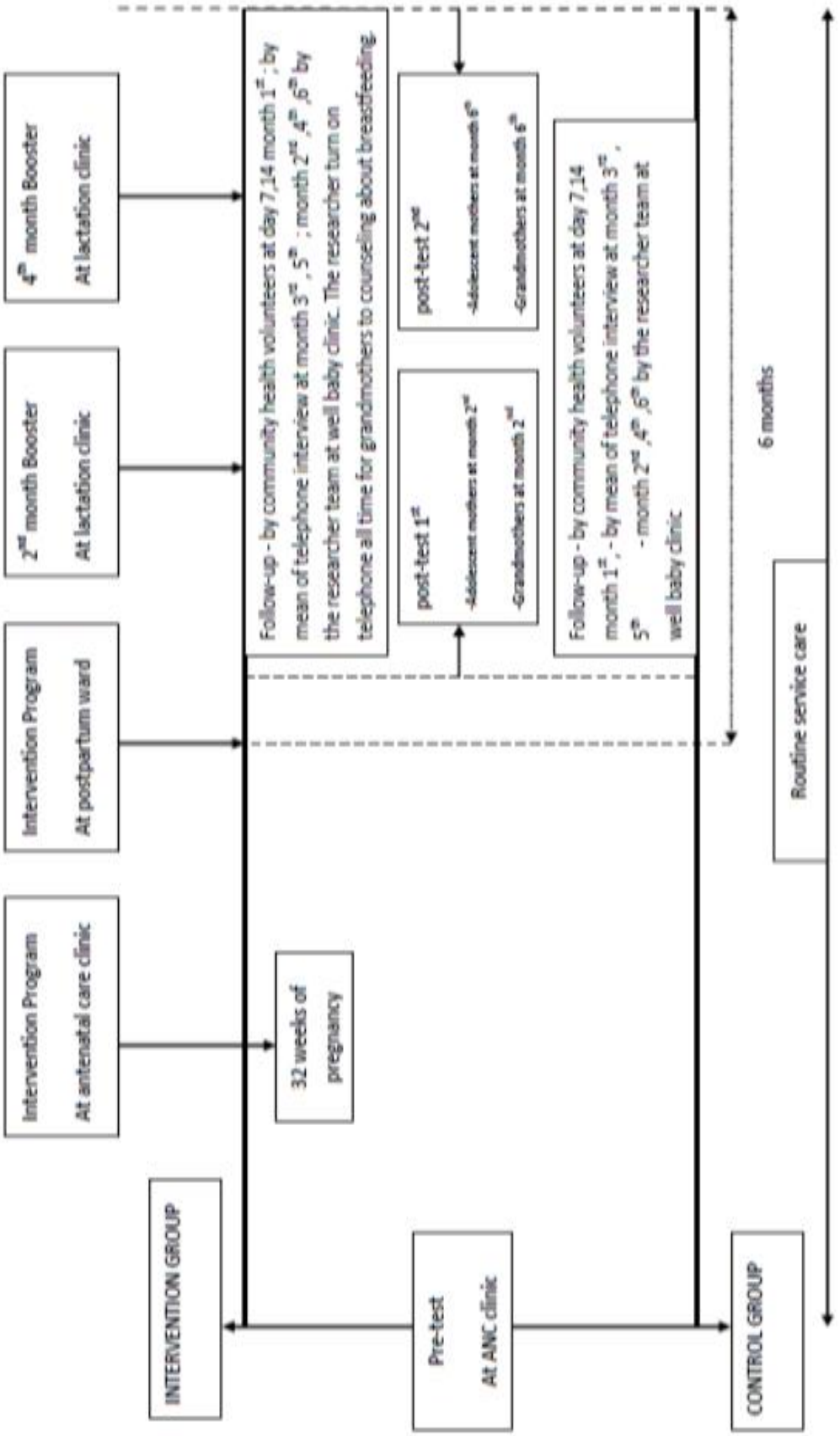

Figure 3: Intervention and follow-up

3.2 STUDY AREA

The study was conducted at two locations: Banmi hospital in Lopburi province and Inburi hospital in Singburi province. These two hospitals were selected by purposive sampling according to their high rate of adolescent pregnancy (18.4% of pregnancies at Banmi hospital and 19.7% at Inburi hospital) based on data obtained from the antenatal care clinic of both hospitals (Banmi and Inburi Hospital, 2013). These rates of adolescent pregnancy are higher than the target set by the World Health Organization that the rate of adolescent pregnancy should not exceed 10%. The rate of exclusive breastfeeding in adolescent mothers is 5.2% and 5% at the Banmi and Inburi hospitals, respectively. Thus, the rate of exclusive breastfeeding is lower than the operational goal of an exclusive breastfeeding rate of 50% for the first six months. Banmi district, Lopburi province, and Inburi district, Singburi province, are located in the central region of Thailand and have similar socioeconomic and demographic characteristics. In addition to the number of patient beds, the number of staff and the clinical guidelines for taking care of a woman's pregnancy are similar. Both hospitals are General Hospitals under the Ministry of Public Health and have a national policy to promote breastfeeding. The Ten Steps to Successful Breastfeeding policy serves as a guideline for the hospitals' activities and for the public health care providers associated with the prenatal, delivery and postpartum care for mothers, with the goal of supporting, promoting and protecting breastfeeding. Both hospitals participate in the Baby-Friendly Hospital Initiative (BFHI), emphasizing the needs of children and helping mothers to breastfeed their babies by using the Ten Step to Successful Breastfeeding as criteria for informing activities.

3.3 STUDY PERIOD

This study evaluated the intervention program during an eight-month period from the middle of May 2015 (after the approval of the Ethics Committee) to the end of March 2016.

3.4 STUDY POPULATION

The target population was grandmother and adolescent mother dyads. Pregnant adolescents with a gestational age of about 32 weeks who came to receive antenatal care and delivery at the Banmi and Inburi Hospitals, Thailand, were included in the study. Mode of obstetrical delivery in adolescent pregnancy were selected similarly for the final comparison. Thus, the samples in this study were selected by purposive sampling. The inclusion and exclusion criteria are described at following.

Inclusion Criteria (Adolescent Mothers)

a) Pregnant Thai women, aged 10–19 years
b) First time mothers or first baby
c) Normal breasts and nipples
d) Good relationship with mother (grandmother of the baby)
e) Husband and mother (grandmother of the baby) have a good relationship
f) Used antenatal care, delivery and well-child care services at either Banmi or Inburi Hospitals
g) Has a telephone
h) Willing to participate in this study

Exclusion Criteria (Adolescent Mothers)

a) Premature delivery
b) Presence of disease or contraindication such as
    a. Infected with the human immunodeficiency virus (HIV)
    b. Taking antiretroviral medications
    c. Infected with human T-cell lymphotropic virus type I or type II
    d. Untreated, active tuberculosis
    e. Using or is dependent on an illicit drug
    f. Taking prescribed cancer chemotherapy agents, such as antimetabolites that interfere with DNA replication and cell division

g. Undergoing radiation therapies (although such nuclear medicine therapies require only a temporary interruption in breastfeeding)
h. Herpes simplex lesion on breast or nipple
i. Having chickenpox or blisters on skin
j. Hypertensive disorder during pregnancy

c) Presence of complications after delivery that might pose potential obstacles to breastfeeding, for example, a fever over 38 ℃ twice a day.
d) Unable to participate in the program for the duration of the study period

Inclusion Criteria (Infants)

a) APGAR scores at minute 5 were equal to 7 points or higher
b) Birth weight between 2,500–4,000 grams

Exclusion Criteria (Infants)

a) Problems with sucking as a result of cleft lip, cleft palate or severe tongue-tie
b) Presence of breastfeeding contraindications such as
    a. Diagnosed with galactosemia
    b. Lysinuric protein intolerance
    c. Phenylketonuria (PKU)
    d. Severe jaundice
c) Unable to participate in the program for the duration of the study period

Inclusion Criteria (Grandmothers)

a) Thai women aged 35–60 years old
b) Live in the same house as adolescent mothers or nearby
c) Have experience in taking care of infants
d) Willing to participate in this study

Exclusion Criteria (Grandmothers)

a) Have a disease such as active tuberculosis or scabies
b) Unable to participate in the program for the duration of the study period

3.5 SAMPLE SIZE

This study was based on a proportional comparison of event outcomes in two population groups. An adequate sample size was estimated using α = 5%, β = 20% and a 1:1 ratio of the intervention group to the control group; the control group was selected to exhibit a 5% prevalence of exclusive breastfeeding during the first six months (Social Medicine Department, Inburi Hospital Report, 2012). We expected 30% prevalence of exclusive breastfeeding during the first six months in the intervention group, according to the 10th National Economic and Social Development Plan 2007–2011 and considering a potential 20% withdrawal rate. The sample size was estimated using the following formula:

$$M = \frac{\{z_{1-\alpha/2}\sqrt{2p\,(1-p)}+z_{1-\beta}\sqrt{P_A(1-P_A)+P_B(1-P_B)}\}^2}{\sigma^2}$$

(Campbell et al, 1995) [139]

Where M = number of sample size in each group (intervention and control group)

P_A and P_B are the proportion of events of interest (outcome) for intervention and control groups = 0.3 and 0.05

$P = \frac{(P_A+P_B)}{2} = 0.175$

$\sigma = P_A - P_B = 0.25$

$z_{1-\alpha/2}$ is normal deviate at level of significance, α = 0.05, so $z_{1-\alpha/2} = 1.96$

$z_{1-\beta}$ is normal deviate at 1-β% power with β% of type II error, normally type II error is considered 20%, so $z_{1-\beta} = 0.84$

$$M = \frac{\{z_{1-\alpha/2}\sqrt{2p\,(1-p)}+z_{1-\beta}\sqrt{P_A(1-P_A)+P_B(1-P_B)}\}^2}{\sigma^2}$$

$$M = \frac{\{1.96(0.537)+0.84(0.507)\}^2}{(0.25)^2}$$

M = 35.18 + (20% attrition) = 42

The calculated sample size for each group indicated a minimum of 42 pairs (grandmother and adolescent mother dyads). Forty-two pairs of subjects were then assigned to participate in Experiential Learning with Empowerment Strategies and Social Support (the intervention group), which included antenatal education and postnatal support strategies in addition to standard knowledge of breastfeeding techniques. The control group only received standard education on breastfeeding techniques.

3.6 RECRUITMENT AND ELIGIBILITY

In the first step of recruitment, the researcher went to the antenatal care clinic to greet and meet pregnant adolescents. Second, the researcher provided information about the program on improving the rate of exclusive breastfeeding in adolescent mothers. Third, the researcher requested the address and telephone number from pregnant adolescents in order to contact their mothers (the grandmothers). Fourth, the researcher contacted the grandmothers to describe the project and persuade them to join the program. And last, the participants were provided with a consent form to sign and became involved in the program starting with their first visit to the antenatal care clinic at the gestational age of about 32 weeks until 6 months after delivery.

3.7 INTERVENTION PROCEDURE

3.7.1 Intervention for nurses

The researcher conducted a 3-day training course for 6 nurses who work in the labor room and postpartum ward. The nurses were the assistant researchers in this study. They got involved by first attending a training course from the Thai Breastfeeding Center Foundation with medical doctors and nurses who are experts in breastfeeding.

The objectives of this training course were as follows:

a) To improve and update breastfeeding knowledge
b) To improve the skills necessary for breastfeeding

c) To improve skills for coping with breastfeeding problems by providing training for mothers and grandmothers

Table 2: The intervention training program for nurses

Day (Time)	Objective	Learning process, methods and material	Evaluation
1 (8am-4pm)	-To improve and update breastfeeding knowledge - To improve skills for coping with breastfeeding problems by providing training for mothers and grandmothers	**Learning process** - Introduction and overview of breastfeeding - Explanation of Ten Steps to Successful Breastfeeding - Anatomy and physiology of milk production and releasing milk - How to evaluate and help mothers breastfeed - Breastfeeding counseling - Code of Marketing - The power of lactation **Methods, Material** - PowerPoint - Role-play - Discussion, questions	Pre-test before training - Question and answer
2 8.30am-4.30pm	- To improve and update breastfeeding knowledge - To improve skills for coping with breastfeeding	**Learning process** - Common breastfeeding problems: Case study - Birth control and drug use during breastfeeding - Alternative feeding methods - Continued breastfeeding **Methods, Material**	Post-test - Question and answer

Day (Time)	Objective	Learning process, methods and material	Evaluation
	problems by providing training for mothers and grandmothers	- PowerPoint - Discussion, questions	
3 8.30am -4pm	- To improve the skills necessary for breastfeeding	**Learning process** - Breastfeeding technique - Holding baby correctly while breastfeeding - Latching correctly - Expressing and storing breast milk for cup feeding - Technique to express breastmilk by hand - Collection and storage of breastmilk - Returning to work and breastfeeding - Counseling in case of breastfeeding problem by using LATCH SCORE - Solving common breastfeeding problems **Methods, Material** - Practice - Role-play - Discussion, questions	- Practice - Question and answer

3.7.2 Intervention for grandmothers

The program of Experiential Learning with Empowerment Strategies and Social Support was based on the theories of Kolb (1984), Gibson (1991) and House (1981) as applicable to antenatal education and postnatal support strategies. The researcher conducted a training course for grandmothers as a means of widening the support network of adolescent mothers and encouraging them to improve the rate and duration of exclusive breastfeeding. Grandmothers were educated on breastfeeding, and their attitudes toward breastfeeding and breastfeeding practices were assessed. Knowledge was imparted through communication, by sharing experiences and prior knowledge and through demonstration and role play. The four steps of the program are outlined, as follows:

Step 1- Discovering reality. The prior knowledge or misunderstandings of grandmothers was evaluated, confronting myths about breastfeeding and encouraging compliance with an exclusive breastfeeding plan. Furthermore, the important role of grandmothers in supporting their daughters was presented.

Step 2- Critical reflection. Grandmothers reflected on the breastfeeding practice, reconsidered the evidence, indicated what influenced them to make certain decisions and learned how to manage problems appropriately. The grandmothers discovered/uncovered their own abilities from sharing experiences with others. In this way, they were able to find useful methods for themselves and learn from other grandmothers' experiences.

Step 3- Taking charge. The abilities of grandmothers to encourage breastfeeding were developed as well as their decision-making skills; grandmothers were provided with information on how to cope with problems and more knowledge on breastfeeding and information on how to care for and assist their daughters during exclusive breastfeeding. This was performed using role play and demonstration, letting grandmothers follow the method and making sure that they could do it on their own. Encouragement and support were provided on how to overcome problems.

Step 4- Holding on. Focus was placed on the development of self-confidence and abilities to support exclusive breastfeeding for the first six months; grandmothers practiced the methods until gaining confidence. The importance of friendly, two-way discussion in the face of problems was also discussed as well as techniques for reducing stresses and concern and for maintaining positive thinking.

Table 3: The intervention training program session for the grandmothers at antenatal care clinic (1st day)

Session/Configuration/ Duration	Objectives	Topic/Activity	Methods/ Materials	Evaluation
Session 1: (60 minutes) **The step of abstract conceptualization (Taking charge)** **Concrete experience (Discovering reality)** **Reflective observation**	- To raise concern about the importance of breastfeeding - To explain the benefits of breastfeeding	***Importance and benefits of breastfeeding***: 1. The researcher introduces the lesson and builds feelings by watching VCD which component of the meaning of mother and human milk value and random question to the participants 1-2 persons. 2. The researcher lets the participants contribute, sharing experience, ideas, the feeling of the meaning of mother, breastfeeding behavior. 3. The researcher randomly questions the participants for presentation and someone with different ideas can share their opinions. 4. The researcher concludes and presents group's experience. 5. Divide into groups, each group composed of 3–4 persons; discussion about the importance and benefits of breastfeeding. 6. Each group presents its outcome after meeting.	VCD "im-aun song" Activity sheet 1	- observing, participation, and interest in the meeting (stimulating if they did not participate) - sharing opinions - they can tell about the importance and benefits of breastfeeding

(Critical reflection) **Active experimentation (Holding on)**		7. The researcher makes conclusions of the opinions of each group. 8. The researcher describes the importance and benefits of breastfeeding. 9. Each group writes a slogan or short message about the value of human milk. 10. Representative of each group presents slogan or short message. 11. The researcher concludes the lesson. **Discovering reality:** allowing grandmothers to share their ideas, knowledge, attitudes, and feelings about the importance and benefits of breastfeeding from taking care of their own children by exclusively breastfeeding in the past. **Critical reflection:** allowing grandmothers to show their ideas, knowledge, attitudes, and feelings about the importance and benefits of breastfeeding with other grandmothers in the group, while the members reflect their opinions. **Taking charge:** describing the importance and benefits of breastfeeding. **Holding on:** allowing grandmothers to ask	Activity sheet 2 Flip chart "Importance and benefits of breastfeeding"	

		questions; conclude, and review their knowledge about the importance and benefits of breastfeeding.		
Session 2: (60 minutes) **The step of abstract conceptualization (Taking charge)** **Concrete experience (Discovering reality)** **Reflective observation (Critical reflection)** **Active experimentation (Holding on)**	- Having knowledge about composition and function of breast - Describing the producing and releasing of milk - Describing how to latch on correctly	***Composition and function of breast, the producing and releasing of milk, and latching on*** 1. The researcher introduces to the lesson and describes how to breastfeed, the knowledge of the breast, and the producing and releasing of milk. 2. The researcher describes some parts and encourages grandmothers to share experiences of producing and releasing of milk and latching on. 3. Divide into groups and discuss the obstacles and why did mothers do not breastfeed. 4. Each group brainstorms to seek ways to enhance breastfeeding. 5. Each group presents data after brainstorming. 6. The researcher concludes the issues after each group presents similar or different ideas.	Flip chart " Breast and lactation" VCD Activity sheet 1 Activity sheet 2 Whiteboard	- grandmothers can tell about producing and releasing of milk and how to latch on correctly

		Discovering reality: letting grandmothers express their ideas about the producing and releasing of milk and latching on. **Critical reflection:** allowing grandmothers to share their knowledge and experience with other grandmothers and having each member reflect her opinion. **Taking charge:** describing to grandmothers the composition and function of the breast, the producing and releasing of milk, and correct latching on. **Holding on:** allowing grandmothers to ask questions, reviewing their knowledge of the producing and releasing of milk and latching on.		
Session 3: (60 minutes) **The step of abstract conceptualization (Taking charge)** **Concrete experience (Discovering reality)**	- Grandmother can hold baby for breastfeeding in different ways. - Recommend adolescent mothers to hold baby in different	***Positioning*** 1. The researcher describes the position for breastfeeding. 2. The researcher demonstrates, holding the doll, and grandmothers help the researcher with the demonstration.	Flip chart Doll model	- they can hold baby in different ways and correctly (if someone does it wrong or cannot do it, the research assistant will help

	ways while			until she can do it)
Reflective observation (Critical reflection)	breastfeeding	3. Divide into groups; the researcher shows pictures of right/wrong methods of holding the baby, and each group discusses the pictures. 4. The researcher and the grandmothers join in a synopsis.	Activity sheet 1	
Active experimentation (Holding on)		5. Representatives of each group role play holding the baby, and other members also help and make suggestions. 6. The members talk about holding the baby while they are observing; after that, the researcher gives them recommendations. **Discovering reality:** letting grandmothers show the position for feeding infants and how to use the position in the different ways. **Critical reflection:** letting grandmothers reflect their action and knowledge of the position for feeding. **Taking charge:** demonstrating holding the doll for feeding in the different ways and watch VCD. **Holding on:** letting grandmothers ask questions and practice holding the doll.	Activity sheet 2	

Table 4: The intervention training program session for the grandmothers at antenatal care clinic (2nd day)

Session/Configuration/ Duration	Objectives	Topic/Activity	Methods/ Materials	Evaluation
Session 1: (60 minutes)		***Expressing, storing breast milk and feeding with cup***		
Concrete experience (Discovering reality)	- Grandmothers can tell about expressing and storing breast milk - Grandmothers can feed baby with cup	1. The researcher introduces the lesson and invites each group to share experiences of problems and obstacles to expressing, storing breast milk, and cup feeding. 2. The researcher randomly questions and invites groups to share ideas of the different methods. 3. The researcher concludes the content and links to descriptions of expressing breast milk.	- Breast model - Doll model - Activity sheet 1 Flip chart	- they can express breast milk by hand - they can explain step of storing breast milk - they can show the method of feeding with cup
Abstract conceptualization (Taking charge)		4. The researcher describes expressing by hand, storing breast milk, and cup feeding.		(if someone does it wrong or cannot do it, the research assistant will make recommendations until she can do it)
Reflective observation (Critical reflection)		5. Watch the VCD of expressing breast milk and cup feeding and let the participants discuss and ask questions.	VCD	
Active experimentation		6. Divide into groups where everyone tries out		

(Holding on)		expressing breast milk with a breast model and tries to feed with a cup. 7. The participants can ask the research assistant for the steps in expressing breast milk and cup feeding. 8. The participants discuss the procedure and indicate the steps that are difficult to practice. 9. The research assistant for each group concludes the outcome of the practice and helps them learn the right method of expressing breast milk. **Discovering reality:** allowing grandmothers to share ideas about methods of expressing and storing breast milk, problems, and obstacles to expressing and storing breast milk. **Critical reflection:** allowing grandmothers to reflect on their methods and knowledge in solving any problems in their experience of expressing and storing breast milk and feeding. **Taking charge:** educating grandmothers about the methods of expressing and storing breast milk and feeding with a cup. **Holding on:** letting grandmothers review their	- Breast model - Doll model - Activity sheet	

		knowledge and demonstrations and ask questions about expressing and storing breast milk and feeding with a cup.		
Session 2: (60 minutes) **Concrete experience (Discovering reality)** **Reflective observation (Critical reflection)** **Abstract conceptualization (Taking charge)** **Active experimentation (Holding on)**	- Grandmothers can explain the method to solve breastfeeding problem - Grandmothers have a self-confidence to help adolescent mothers when they face breastfeeding problems	***How to solve breastfeeding problems:*** ***-Insufficient milk supply*** ***-Sore nipple*** ***-Engorgement*** ***-Blocked duct*** ***-Mastitis*** 1. The researcher introduces the lesson and divides into groups, sharing breastfeeding experiences that they faced. 2. Each group discusses how to solve breastfeeding problems. Representatives of each group present the ways of solving the problem. 3. The researcher concludes and links to descriptions of breastfeeding problems and the methods of solving them 4. Each group discusses 3 case studies of breastfeeding problems. 5. The researcher concludes the methods of	Activity sheet 1 Activity sheet 2 Flip chart Activity sheet 3	- they can describe the methods of solving breastfeeding problems.

		solving breastfeeding problems. **Discovering reality:** letting grandmothers talk about problems of breastfeeding that they faced in the past. **Critical reflection:** letting grandmothers share their methods of solving the problem, with each member reflecting her opinion. **Taking charge:** describing to grandmothers the methods of solving the problems they faced. **Holding on:** showing 3 case studies of breastfeeding problems and letting grandmothers review their knowledge and ask questions.		
Session 3: (60 minutes) **Concrete experience (Discovering reality)** **Abstract conceptualization (Taking charge)**	- Grandmothers know the role to breastfeeding support	***Grandmother's role in breastfeeding support*** 1. The researcher encourages the participants to share ideas about supporting their daughters in breastfeeding. 2. The expert concludes and links to descriptions of social support.	Flip chart	- they can describe their role in breastfeeding support of adolescent mothers.

Reflective observation (Critical reflection) Active experimentation (Holding on)		3. Each group brainstorms about how to support their daughters. 4. Representatives of each group present the methods of support. 5. The expert concludes the issues and has the commitment of the participants to support and promote exclusive breastfeeding. **Discovering reality:** allowing grandmothers to share ideas of how to support and promote exclusive breastfeeding with adolescent mothers. **Critical reflection:** letting grandmothers express their thoughts, attitudes, and feelings to support and promote exclusive breastfeeding and the members reflect their opinions. **Taking charge:** describing to grandmothers the social support they can give to their daughters. **Holding on:** the grandmothers can describe the ways of supporting adolescent mothers and encouraging them to breastfeed their infants only with breast milk.	Activity sheet 1 Whiteboard	

Table 5: The intervention program for grandmothers at postpartum ward and lactation clinic

Date/ Duration	**Objectives**	**Topics**	**Methods/ Materials**	**Evaluation**
1st day postpartum (60 minutes)	- To improve the knowledge and practice on breastfeeding	-Introduction overview of breastfeeding - Positioning - Latching on - Expressing and storing breast milk - Cup feeding	- Flip chart - Describe - practice (real situation - Question & Answer	- Practice activities
2nd ,4th month after delivery (60 minutes)	-To improve skill of breastfeeding problem solving	- Breastfeeding problem - How to solve the breastfeeding problem	-Discussion	- Question and answer

Intervention group. The management training course for grandmothers was set up at Banmi hospital, Lopburi province. The training course was divided into three parts. First, the antenatal care clinic was composed of two 6-hour training sessions on separate days. Adolescent mothers at the gestational age of 32 weeks received a breastfeeding handbook. Second, the researcher team visited and helped mothers and grandmothers at the postpartum ward after the first postpartum day to support proper breastfeeding. The researcher team recommended advice and demonstrated proper technique if necessary during a 1-hour session or until breastfeeding was correctly adopted. The third meeting occurred after discharge from the hospital when the child had its vaccination appointments. Grandmothers had appointments during the 2nd and 4th months postpartum for 1-hour booster training sessions as adolescent mothers acquired routine breastfeeding knowledge. During the postpartum period, they were

followed up by telephone and home visits by community health volunteers. At the end of the program, the researcher gave them the correct answers for the questionnaire.

Control group. The control group was located at Inburi hospital, Singburi province. The grandmothers received routine knowledge on breastfeeding from antenatal clinic staff when they came to the hospital with pregnant adolescents for prenatal care, while adolescent mothers were provided with breastfeeding knowledge from the researcher, similar to the pregnant adolescents in the intervention group. They received breastfeeding knowledge after giving birth and during the postpartum period by telephone and home visits from a community health volunteer. At the end of the program, they received the breastfeeding handbook, and the researcher provided them with the correct answers to the questionnaire.

3.7.3 Intervention for community health volunteers

The researcher conducted two days training course for nineteen health volunteer at Banmi and fifteen health volunteer at Inburi district. They are research assistant for home visit at day seven, day 14 and month 1. They get involved training course by the researcher. The objectives of this training course as follow:

1. To improve and update the breastfeeding knowledge
2. To improve the breastfeeding practice skill
3. To improve skill for coping with breastfeeding problem
4. Collected the data correctly when they visited postpartum mothers

Table 6: The intervention training program for community health volunteers

Day (Time)	**Objective**	**Learning process, methods and material**	**evaluation**
1 (9-12 AM)	-To improve and update the breastfeeding knowledge -To improve the breastfeeding practice skill	**Learning process** -Introduction and overview of situation on breastfeeding -Importance and benefits of breastfeeding including EBF -Composition and function of breast, the producing and releasing of milk, and latching on -Position -Holding baby correctly while breastfeeding -Latching correctly -Expressing and storing breastmilk for cup feeding -Technique to express breastmilk by hand -Collection and storage of breastmilk **Methods, Material** -PowerPoint -Role-play -Discussion, question	-Pre-test before training -Question and answer
2 (9-12 AM)	-To improve skill for coping with breastfeeding problem - Collected the data correctly	**Learning process** -Common breastfeeding problem - Breastfeeding counseling -How to observe and collect the data when they visited postpartum mothers **Methods, Material** -PowerPoint, Discussion, question	-Pre-test before training -Question and answer

3.8 MEASUREMENT TOOLS

This study used the questionnaire developed from the review of related theories and previous research. The questionnaire was composed of 6 parts, as follows:

a) Socio-demographic characteristics
b) Breastfeeding knowledge
c) Attitude toward breastfeeding
d) Breastfeeding practice
e) Perceived social support
f) Information about breastfeeding, such as duration and pattern of breastfeeding, recorded on days 7 and 14 and months 1, 2, 3, 4, 5 and 6 after birth

1. Socio-Demographic and characteristics data questionnaire. The questionnaire was developed by the researcher to collect data on the adolescent mothers' age, education level, marital status, mode of delivery, occupation, income, follow-up information and telephone number. Grandmothers' data was composed of age, education level, occupation, the experience of exclusive breastfeeding at 6 months and the intention to feed their grandchildren. The collection of socio-demographic characteristics also included data on the infant, such as birth weight and appointment date for vaccinations.

2. Breastfeeding knowledge questionnaire. The questionnaire was constructed by the researcher based on a literature review and existing research. Breastfeeding knowledge included the benefits of breastfeeding, the duration of breastfeeding, the difference between breast milk and formula milk, breastfeeding problems/obstacles and techniques for breastfeeding success. The scale included 20 items, and the answers for breastfeeding knowledge were "true" and "false." A correct answer indicated that the participants knew about breastfeeding, and an incorrect answer indicated that participants lacked breastfeeding knowledge about that particular point. A correct answer received a score of 1 point, whereas an incorrect answer received a score of 0 points. The researcher calculated final scores by separating them into three categories and dividing them by the average. Overall, the

highest score of the questionnaire was 1, and the lowest score was 0. The calculation is demonstrated at following.

The average = The highest score - The lowest score/number of class

X = (1-0)/3 = 0.33

0.68 - 1	(0.68*20) - (1*20)	14 - 20
0.34 - 0.67	(0.34*20) - (0.67*20)	7 - 13
0 - 0.33	(0*20) - (0.33*20)	0 - 6

The total scores ranged from 0–20 and were recategorized into good, fair and poor breastfeeding knowledge. Total scores were grouped into three categories, as follows:

a) 14–20 points = good breastfeeding knowledge
b) 7–13 points = fair breastfeeding knowledge
c) 0–6 points = poor breastfeeding knowledge

3. Attitude towards breastfeeding questionnaire. This questionnaire was constructed by the researcher based on a literature review and existing research. The scale included 15 items to determine the level of agreement to each question. A 5-point Likert scale with categories ranging from strongly agree to strongly disagree was used to document the response to all questions. The participants were required to respond to all items by rating them from 1 to 5, as follows: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

Several questions documented positive breastfeeding attitudes, while the remaining indicated negative attitudes toward breastfeeding. Questions that elicited negative attitudes to breastfeeding were reverse scored (i.e., 1=5, 2=4, 5=1, and 4=2). Final scores were calculated by separating scores into three categories and dividing them by the average. The highest score of the questionnaire corresponded to 5 and the lowest to 1, calculated as follows:

The average = The highest score - The lowest score/number of class

X = (5-1)/3 = 1.33

3.67 - 5	(3.67*15) – (5*15)	55 - 75
2.34 - 3.66	(2.34*15) – (3.66*15)	35 - 54
1 - 2.33	(1*15) – (2.33*15)	15 - 34

The attitude scale ranged from 15–75, with higher scores reflecting more positive attitudes about breastfeeding. Total scores were grouped into three groups, as follows:

a) 55–75 points = positive attitude toward breastfeeding
b) 35–54 points = neutral attitude toward breastfeeding
c) 15–34 points = negative attitude toward breastfeeding

4. Breastfeeding practice questionnaire. This questionnaire was developed by the researcher based on a literature review and the existing research. Breastfeeding practice included the three principles of suckling, such as early suckling, frequent suckling and correct suckling. Methods for breastfeeding and problems or obstacles in the breastfeeding practice with expressing, storing and feeding breast milk with cup were identified. The questionnaire was divided into two parts, one for mothers and one for grandmothers.

4.1 Breastfeeding practice questionnaire for adolescent mothers. The scale included 20 items. A 4-rating scale from always to never was used for all questions. The participants were required to respond to all items by rating from 1 to 4, as follows: 4 = always, 3 = very often, 2 = sometimes and 1 = never.

The researcher calculated scores by dividing them into three groups and using the average. The highest score of the questionnaire was 4, and the lowest score was 1, calculated as follows:

The average = The highest score - The lowest score/number of class

X = (4-1)/3 = 1

3.02 - 4	(3.02*20) – (4*20)	60 - 80
2.01 - 3.01	(2.01*20) – (3.01*20)	40 - 59
1 - 2	(1*20) – (2*20)	20 - 39

The total breastfeeding practice score ranged from 20–80, with higher scores reflecting better breastfeeding practices. Total scores were grouped into the following three categories:

a) 60–80 points = good breastfeeding practice
b) 40–59 points = fair breastfeeding practice
c) 20–39 points = poor breastfeeding practice

4.2 Breastfeeding practice questionnaire for grandmothers. The scale included 20 items, and the answers were "practiced" and "not practiced". The "practiced" answer received 1 point, whereas the "not practiced" answer received 0 points. The researcher calculated scores by separating the points into three categories and dividing them by the average score. The highest score of the questionnaire was 1, and the lowest score was 0, calculated as follows:

The average = The highest score - The lowest score/number of class

X = (1-0)/3 = 0.33

0.68 - 1	(0.68*20) - (1*20)	14 - 20
0.34 - 0.67	(0.34*20) - (0.67*20)	7 - 13
0 - 0.33	(0*20) - (0.33*20)	0 - 6

Total breastfeeding practice score ranged from 0–20 with higher scores reflecting better breastfeeding practice. Total scores were grouped into three groups, as follows:

a) 14–20 points = good breastfeeding practice
b) 7–13 points = fair breastfeeding practice
c) 0–6 points = poor breastfeeding practice

5. Perceived of social support questionnaire. This questionnaire was applied to assess the support provided by grandmothers (Srisawat, 2009) and was based on a literature review of the social support literature (House, 1981). The scale consisted of 12 questions:

a) Emotional Support (questions 1–3)
b) Appraisal support (questions 4–5)
c) Information support (questions 6–8)
d) Instrumental support (questions 9–12)

All questions were worded in order to elicit the level of perceived social support received by adolescent mothers while breastfeeding. A 5-point rating scale included the categories of strongly agree, agree, neutral, disagree and strongly disagree, representing a continuum of values from 1 to 5, scored as follows: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

The perceived social support score ranged from 12–60, with higher scores reflecting more perceived social support from grandmothers for breastfeeding. The researcher calculated the final scores by categorizing the resulting scores from the questionnaire into three groups and dividing by the average. The highest score of the questionnaire was 5 and the lowest score 1, calculated as follows:

The average = The highest score - The lowest score/number of class

X = (5-1)/3 = 1.33

3.67 - 5	(3.67*12) – (5*12)	44 - 60
2.34 - 3.66	(2.34*12) – (3.66*12)	28 - 43
1 - 2.33	(1*12) – (2.33*12)	12 - 27

The total scores ranged from 12–60 and were recategorized as low, medium and high levels of perceived social support:

a) 44–60 = high level of perceived social support
b) 28–43 = medium level of perceived social support
c) 12–27 = low level of perceived social support

6. Exclusive breastfeeding forms. Information was documented by the researcher using forms to record the details on the mode of infant feeding, whether exclusive breastfeeding (EBF), predominant breastfeeding (PDBF), complementary feeding (CF) or non-breastfeeding (NBF) in addition to breastfeeding duration, problems experienced during breastfeeding or barriers to exclusive breastfeeding. Mode of infant feeding was recorded on days 7 and 14 and month 1 by the community health volunteer at the home visit in addition to months 2, 4 and 6 by the researcher team at vaccination and follow-up appointments at the well-baby clinic. At months 3 and 5 the researcher team interviewed adolescent mothers about mode of infant feeding by telephone.

3.9 VALIDITY AND RELIABILITY

3.9.1 Validity of research instrument

The researcher evaluated the data on socio-demographic characteristics, breastfeeding knowledge, attitudes toward breastfeeding, breastfeeding practices, perceived level of social support and mode of breastfeeding. The program outlined in the breastfeeding handbook and the guidelines of the Experiential Learning with Empowerment Strategies and Social Support program for grandmothers was examined by three experts from the university under the supervision of the research adviser.

Results of the Index of Item Objective Congruence (IOC) for the questionnaire, divided into five parts, were 0.93 for the questionnaire on breastfeeding knowledge, 0.87 for attitudes toward breastfeeding and 1 for breastfeeding practices

(for each questionnaire, one for adolescents and one for grandmothers) and 1 for perceived of social support.

3.9.2 Reliability of research instrument

The researcher tested the questionnaire for reliability during a pilot study with grandmother and adolescent mother dyads at Phra Phutthabat District, Saraburi Province during 3–24 November 2014, considering 30 participant pairs. Results from the pilot study were divided in seven parts. First, breastfeeding knowledge of adolescent mothers, according to the KR-20 measure, was 0.72. Second, breastfeeding knowledge of grandmothers was 0.72 (KR-20). The third and fourth attitude toward breastfeeding of adolescent mothers and grandmothers, the Cronbach Alpha measure, was 0.73. The fifth and sixth attitudes toward breastfeeding practices of adolescent mothers and grandmothers, measured by Cronbach Alpha, were 0.79. Finally, for perceived social support, the Cronbach Alpha measure was 0.89, as shown in Appendix C.

3.10 DATA COLLECTION

The data collection procedures of this study were performed as follows:

a) An introduction letter was composed with detailed information, requesting permission to conduct this research from the Dean of the College Health Sciences, Chulalongkorn University and from the Directors of Banmi and Inburi Hospital, including staff members from the antenatal care clinic, labor room, postpartum ward, well-baby clinic and lactation clinic.
b) Four research assistants were trained to collect the data.
c) Participants were recruited or pregnant women and grandmother dyads who were eligible to participate and who conformed to the inclusion criteria of the study.
d) Adolescent mothers and grandmothers participated in the activities described at following.

Adolescent mothers

a) Adolescent mothers in both the intervention and control groups were scheduled face-to-face interviews to document their knowledge and attitudes toward breastfeeding via questionnaires (as a pre-test).
b) During the follow-up period (month 2) when babies returned to receive their vaccinations, both groups were interviewed and once again completed questionnaires on breastfeeding knowledge, attitudes and practices (the first post-test).
c) During the follow-up period (days 7 and 14 and month 1), the community health volunteer visited the home to provide recommendations and record observations on breastfeeding practices and modes of infant feeding.
d) During the follow-up period (months 2, 4 and 6) when babies returned to receive vaccinations, the research assistant asked about mode of infant feeding.
e) During the follow-up period (month 6), both groups were interviewed and requested to complete questionnaires on their breastfeeding knowledge, attitudes and practices as well as perceived social support (2^{nd} post-test).

Grandmothers

Grandmothers in both groups underwent face-to-face interviews, were provided general information and then tested on their knowledge and attitudes toward breastfeeding via questionnaires (as a pre-test).

a) Grandmothers in the intervention group were asked to participate in the Experiential Learning with Empowerment Strategies and Social Support study on antenatal education and postnatal support strategies.
b) During the follow-up period (days 7 and 14 and month 1), the community health volunteer visited homes to provide recommendations and to record observations about breastfeeding practice and mode of infant feeding.
c) During the follow-up period (months 2 and 4), grandmothers in the intervention groups participated in a joint discussion group for talking about breastfeeding problems and methods to solve them.

d) During the follow-up period (month 2), the grandmothers in both groups were surveyed about their breastfeeding knowledge, attitudes and practices via questionnaires (the first post-test).
e) During the follow-up period (month 6), the grandmothers in both groups were surveyed about their breastfeeding knowledge, attitudes and practices via questionnaires (2^{nd} post-test).

The researcher checked the completeness of the questionnaires after each step. Data was collected until all necessary information was obtained, and the questionnaires were verified for data analysis.

3.11 DATA ANALYSIS

The researcher analyzed the compiled data using the Statistical Package for Social Sciences (SPSS for Windows). The data was first expressed by descriptive statistics, including percentage, mean, frequency and standard deviation. The inferential statistical techniques consisted of the chi-square test, Fisher's exact test, a paired t-test, an independent t-test, the Mann-Whitney U test and a repeated analysis of variance (ANOVA).

a) Socio-demographic characteristics were assessed according to frequency, percentage, mean and standard deviation, chi-square test, Fisher's exact test, an independent t-test and the Mann-Whitney U test.
b) The rates of exclusive breastfeeding were compared using a chi-square test considering statistical significance at the 0.05 level.
c) The duration of breastfeeding was compared using the Mann-Whitney U test considering statistical significance at the 0.05 level.
d) The breastfeeding practice was assessed using mean, standard deviation and a paired t-test to compare the same groups before and after and then to compare between groups using an independent t-test.
e) Perceived social support was evaluated by calculating the mean, standard deviation and an independent t-test.

f) The differences between three times periods with respect to breastfeeding knowledge, attitudes and practices were assessed using repeated analysis of variance (ANOVA) tests.

3.11.1 Data measurement

Table 7: Data measurement

Variable/ Outcomes	Outcomes measure	Method of analysis	Reason
Independent variables			
Age	Interval scale	1. Descriptive Statistics (mean, SD, frequency, Percentage) 2. Chi-square test 3. Fisher's exact test 4. T-test	1. To analyze the data baseline socio-demographic and characteristics in the intervention and the control groups 2. To compare the proportion of socio- demographic between the intervention and control groups
Parity	Nominal scale		
Education	Ordinal scale		
Occupation	Ordinal scale		
Incomes	Ratio scale		
Marital status	Nominal scale		
Mode of delivery	Nominal scale		
First time ANC (gestation age)	Ratio scale		
Infant birth weight	Ratio scale	5. Mann-Whitney U test	
Relation with adolescent mothers	Nominal scale		
Intention to feed their children	Nominal scale		
Experience of EBF	Nominal scale		
Dependent variables			
Breastfeeding knowledge	Nominal scale	1. Paired t-test	1.To compare the difference of mean
	Interval scale		

Variable/ Outcomes	Outcomes measure	Method of analysis	Reason
Attitude towards breastfeeding	Ordinal scale Interval scale	2. Independent t-test 3. Repeated measure analysis of variance (ANOVA) 4. Mann-Whitney U test 5. Chi-square test	scores within group before and after 2.To compare the difference of mean scores between two group 3. Comparing difference 3times period on KA 4.Comparing the duration of EBF 5.Comparing the rates of EBF
Breastfeeding practice	Ordinal scale Interval scale		
Perceived of social support	Ordinal scale Interval scale		
The duration of EBF	Ratio scale		
The rates of EBF	Nominal scale		

3.12 ETHICAL CONSIDERATION

The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (No. 007.1/58), the Ethics Committee on Research Involving Human Subjects of both the Banmi (No.2558/01) and Inburi Hospitals approved the research protocol. The grandmothers and adolescent mothers were given information about the study, and consent was obtained. Whenever the adolescent mother was younger than 18 years, both she and a parent/guardian signed the consent form. The participants were able to withdraw from the study at any time without any effect on their treatment. The confidentiality of the participants, their families and the health care providers was respected.

CHAPTER IV
RESULT

This study aimed to demonstrate the effects of Experiential Learning with Empowerment Strategies and the Social Support of grandmothers on improving the rate of exclusive breastfeeding in adolescent mothers during the first six months of the baby's life. Pairs of grandmothers and adolescent mothers from two hospitals in the Lopburi and Singburi provinces were included in this study. The two hospitals had a total of 168 subjects divided into control and intervention groups, including 42 pairs of grandmothers and adolescent mothers in each group. The Banmi hospital in Lopburi province was the intervention group, and the Inburi hospital Singburi province was the control group. All grandmothers and adolescent mothers gave consent to participate in the study.

This chapter presents and analyses the findings of the study, guided by the research hypothesis. There are two sections in this chapter. The first section describes the sample characteristic and the baseline demographic data. The second focuses on hypothesis testing, considering the effect of the program on increasing the rate and duration of exclusive breastfeeding during the first six months as well as its effect on breastfeeding knowledge, attitudes toward breastfeeding, breastfeeding practices and perceived social support.

4.1 BASELINE CHARACTERISTIC DATA OF SAMPLE

4.1.1 General characteristic of adolescent mothers

A total of 84 adolescent mothers participated in the study (intervention *n*=42; control *n*=42). The average age of both the intervention and the control groups was 18 years. Most adolescent mothers were pregnant for the first time, or 88.1% of the intervention group and 78.57% of the control group. Nearly half (40.5%) of the mothers in the intervention group and 47.6% in the control group had completed junior high school. Adolescent mothers in both groups were largely married and living with their husband, or 92.86% in the intervention group and 90.48% in the

control group. Most mothers were unemployed, 76.19% and 80.95% in the intervention and control groups, respectively. Regarding income, most adolescent mothers had no income, or 92.86% and 88.10% in the intervention and the control groups, respectively. The average gestational age during the first visit to the antenatal care clinic was 16.5±9 and 14±9 for the intervention and control groups, respectively; the minimum and maximum gestational ages were 6-30 and 5-29, respectively. The proportion of normal labor to cesarean section in the intervention and the control groups was 45.24%:54.76% and 50%:50%, respectively, and finally, the average infant birth weight of the intervention and the control groups was 3054.76±313.22 and 3079±274.09, respectively.

Adolescent mothers in the intervention and the control groups were similar in terms of age, socioeconomic standing, education, marital status, occupation, income and gestational age during the first visit to the antenatal care clinic as well as infant birth weight, as determined by the Mann-Whitney U test, chi-square test, Fisher's exact test and t-test. No statistically significant differences were found in the characteristics of the intervention and the control groups, as shown in Table 7.

Table 8: Baseline characteristics of adolescent mothers (*n*=84)

Characteristics	Intervention group (*n*=42)	Control group (*n*=42)	*p*-value
Age (years)			0.791 (a)
Mean (SD)	17.88 (1.19)	17.81 (1.27)	
Min - Max	15-19	15-19	
Parity, (n, %)			0.242 (b)
Primiparous	37(88.1)	33(78.57)	
Multiparous	5(11.9)	9(21.43)	
Education, (n, %)			0.873 (b)
Primary school	10(23.8)	10(23.8)	
Junior high school	17(40.5)	20(47.7)	
Senior high school or equivalent	9(21.4)	8(19)	
Higher than senior high school	6(14.3)	4(9.5)	
Marital status, (n, %)			1.00(c)
Married	39(92.86)	38(90.48)	
Separated temporary	0(0)	1(2.38)	
Permanent separation	2(4.76)	2(4.76)	
Solitary	1(2.38)	1(2.38)	
Occupation, (n, %)			0.449 (c)
Student	7(16.67)	3(7.14)	
Employed	3(7.14)	4(9.53)	
Unemployed	32(76.19)	34(80.95)	
Business owner	0(0.00)	1(2.38)	
Income, (n, %)			0.470 (c)
No income	39(92.86)	37(88.10)	
< 5,000	1(2.38)	0(0.00)	
5,000-9,999	1(2.38)	3(7.14)	
10,000-15,000	1(2.38)	1(2.38)	
> 15,000	0(0.00)	1(2.38)	

Characteristics	Intervention group (*n*=42)	Control group (*n*=42)	*p*-value
First time ANC (weeks)			0.209 (d)
Median (IQR)	16.5(9)	14(9)	
Min - Max	6 - 30	5 - 29	
Mode of delivery, (n, %)			0.662(b)
Normal labor	19(45.24)	21(50)	
Cesarean section	23(54.76)	21(50)	
Infant birth weight			0.704(a)
Mean ± SD	3054.76±313.221	3079±274.087	
Min-max	2525 - 3635	2555 - 3610	

*Significant at p-value < 0.05, (a) = t-test, (b) = Chi-square, (c) = Fisher's Exact test, (d) = Mann – Whitney U test

4.1.2 Breastfeeding knowledge and attitude towards breastfeeding score of adolescent mothers at baseline

Among the 84 adolescent mothers (42 subjects per group), the total breastfeeding knowledge score was 20 points. The average breastfeeding knowledge score for the intervention and the control groups was 11.43±3.65 and 12.57±2.66, respectively. No statistically significant differences in breastfeeding knowledge were found between the intervention and the control groups (*p*=0.106), as shown in Table 8. The total score of attitudes toward breastfeeding was 75 points. The average score of attitudes toward breastfeeding for the intervention and the control groups were 51.69±5.736 and 52.79±5.795, respectively. No statistically significant differences were found in attitudes toward breastfeeding between the two groups (*p*= 0.387), as shown in Table 8.

Table 9: Score of breastfeeding knowledge and attitude towards breastfeeding of adolescent mother at baseline (*n*=84)

Variables	Intervention (*n*=42)	Control (*n*=42)	*t*	*p*-value
Score of breastfeeding knowledge			-1.638	0.106
Mean (SD)	11.43 (3.65)	12.57 (2.66)		
Min-max	6 - 18	4 - 15		
Score of attitude toward breastfeeding			-0.780	0.387
Mean (S.D.)	51.69 (5.736)	52.79 (5.795)		
Min-max	39 - 67	39 - 64		

*Significant at p-value < 0.05, using independent t-test

4.1.3 General characteristic of grandmothers

A total 84 grandmothers (intervention *n*=42; control *n*=42) participated in the study. The average age of the intervention and the control groups was 50 years. No statistically significant differences were found in age between the intervention and the control groups (*p*=0.767). In regard to relationship with adolescent mothers, 57.14% of the intervention group and 45.24% of the control group were the mothers of the adolescent mothers. Regarding the education level, most had completed primary school (76.20% and 78.60% of the intervention and control groups, respectively). Almost half of participants in the intervention (40.48%) and the control (59.52%) groups were employed. Most participants in the intervention (97.62%) and the control (90.48%) groups had no experience in exclusive breastfeeding for 6 months. Finally, 45.24% of the intervention and 42.86% of the control group intended to feed their grandchild with breast milk and water. Only 9.52% of the intervention and 19.05% of the control groups intended to feed their grandchild with only breast milk. No statistically significant differences were found between the intervention and the control groups in the relationship to adolescent mothers, education, occupation, experience in exclusive breastfeeding or the intention to feed children, as shown in Table 9.

Table 10: Baseline characteristics of grandmothers (*n*=84)

Characteristics	**Intervention group (*n*=42)**	**Control group (*n*=42)**	***p*-value**
Age (years)			0.653 (a)
Mean (SD)	50.24(6.72)	49.55(7.27)	
Min-max	35 - 60	35 -60	
Relation with adolescent mother, (n, %)			0.446(b)
Mother	24(57.14)	19(45.24)	
Husband's mother	8(19.05)	15(35.72)	
Grandmother	6(14.29)	4(9.52)	
Husband's grandmother	2(4.76)	1(2.38)	
Aunt	2(4.76)	3(7.14)	
Education, (n, %)			0.673(b)
Illiteracy	4(9.50)	2(4.80)	
Primary school	32(76.20)	33(78.60)	
Secondary school	5(11.90)	7(16.70)	
Higher than secondary school	1(2.40)	0(0)	
Occupation, (n, %)			0.055(b)
Business owner	3(7.14)	1(2.38)	
Trade	3(7.14)	3(7.14)	
Employed	17(40.48)	25(59.53)	
Housewife	4(9.53)	8(19.05)	
Agriculturist	15(35.71)	5(11.90)	
Experience for exclusive breastfeeding, (n, %)			0.36(b)
ever	1(2.38)	4(9.52)	

Characteristics	Intervention group (*n*=42)	Control group (*n*=42)	*p*-value
never	41(97.62)	38(90.48)	
Intention to feed grandchild, (n, %)			0.812(b)
Only breast milk	4(9.52)	8(19.05)	
Breast milk + water	19(45.24)	18(42.86)	
Breast milk + water + formula milk	5(11.90)	4(9.52)	
Breast milk + water + complementary food	8(19.05)	7(16.67)	
Breast milk + water + complementary food+ formula milk	6(14.29)	5(11.90)	

*Significant at p-value < 0.05, (a) = t-test, (b) = Fisher's Exact test

4.1.4 Breastfeeding knowledge and attitude towards breastfeeding score of grandmothers at baseline

Among the 84 grandmothers (42 subjects per group), the total breastfeeding knowledge score was 20 points. The average breastfeeding knowledge score of the intervention and the control groups was 11.81±3.94 and 13.33±3.59, respectively. No statistically significant differences were found in breastfeeding knowledge between the intervention and the control groups (*p*=0.068; Table 10). The total attitude score toward breastfeeding was 75 points. The average score of attitudes toward breastfeeding of the intervention and the control groups was 52.5±5.11 and 51.07±6.95, respectively. No statistically significant differences were found in attitudes toward breastfeeding between the two groups (*p*=0.287; Table 10).

Table 11: Score of breastfeeding knowledge and attitude toward breastfeeding of grandmothers at baseline (*n*=84)

Variables	Intervention (*n*=42)	Control (*n*=42)	*t*	*p*-value
Score of breastfeeding knowledge			-1.850	0.068
Mean (SD)	11.81 (3.94)	13.33 (3.59)		
Min-max	3 - 23	6 - 18		
Score of attitude toward breastfeeding			-1.072	0.287
Mean (SD)	52.5 (5.11)	51.07 (6.95)		
Min-max	37 - 62	34 - 73		

*Significant at p-value < 0.05, using independent t-test

4.1.5 Descriptive statistic of breastfeeding knowledge, attitude towards breastfeeding, breastfeeding practice, and perceived social support level

4.1.5.1 Breastfeeding knowledge level of adolescent mothers

Breastfeeding knowledge was classified into 3 categories, including good breastfeeding knowledge (score=14–30), fair breastfeeding knowledge (score=7–13) and poor breastfeeding knowledge (score=0–6).

At the baseline evaluation, more than half of adolescent mothers in the intervention group (12 mothers; 66.7%) had a fair level of breastfeeding knowledge; after finishing the program, 42 (100%) had a good level of breastfeeding knowledge. In the control group, at both the baseline and at the end of the program, 22 mothers (52.4%) had a good level of breastfeeding knowledge, as shown in Table 11.

Table 12: The breastfeeding knowledge level of adolescent mothers

Knowledge level	Intervention N (%)	Control N (%)
At base line		
Poor	2(4.8)	2(4.8)
Fair	28(66.6)	18(42.8)
Good	12(28.6)	22(52.4)
2-month after delivery		
Poor	0(0)	0(0)
Fair	3(7.1)	21(50.0)
Good	39(92.9)	21(50.0)
6-month after delivery		
Poor	0(0)	1(2.4)
Fair	0(0)	19(45.2)
Good	42(100.0)	22(52.4)

4.1.5.2 Attitude towards breastfeeding level of adolescent mothers

Attitudes of adolescent mothers toward breastfeeding were divided into 3 categories, including positive attitudes toward breastfeeding (score=55–57), neutral attitudes toward breastfeeding (score=35–54) and negative attitudes toward breastfeeding (score=15–34).

Negative attitudes toward breastfeeding were not found in either group. During the baseline assessment, most of the participants in the intervention group indicated neutral attitudes toward breastfeeding (31 mothers; 73.8%), but at the end of the program, 34 mothers (81%) reported positive attitudes toward breastfeeding. The control group had positive attitudes toward breastfeeding that were similar for all three evaluation periods (19 mothers; 45.2%; Table 12).

Table 13: Attitude towards breastfeeding level of adolescent mothers

Attitude level	Intervention N (%)	Control N (%)
At base line		
Neutral	31(73.8)	23(54.8)
Positive	11(26.2)	19(45.2)
2-month after delivery		
Neutral	13(31.0)	23(54.8)
Positive	29(69.0)	19(45.2)
6-month after delivery		
Neutral	8(19.0)	23(54.8)
Positive	34(81.0)	19(45.2)

4.1.5.3 Breastfeeding practice level of adolescent mothers

Breastfeeding practices were sorted into 3 categories, including good breastfeeding practice (score=60–80), fair breastfeeding practice (score=40–59) and poor breastfeeding practice (score=20–39).

At 2 months after delivery, adolescent mothers in the intervention group (35 mothers; 83.3%) had a good level of breastfeeding practice, and at the end of the program, good breastfeeding practices gradually decreased to being exhibited by only 18 subjects (42.9%), although this still represents an overall decent rate of breastfeeding. The control group had a poor level of breastfeeding practice at the beginning of the study (21 subjects; 50%), and this rate gradually increased to 29 mothers (69%) at the end of the program (Table 13).

Table 14: Breastfeeding practice level of adolescent mothers

Practice level	Intervention N (%)	Control N (%)
2-month after delivery		
Poor	3(7.2)	21(50.0)
Fair	4(9.5)	12(28.6)
Good	35(83.3)	9(21.4)
6-month after delivery		
Poor	14(33.3)	29(69.0)
Fair	10(23.8)	12(28.6)
Good	18(42.9)	1(2.4)

4.1.5.4 Perceived social support level of adolescent mothers

Perceived social support was classified into 3 categories, including a perceived high level of social support (score=44–60), medium level of social support (score=28–43) and low level of social support (score=12–27).

The intervention group perceived a high level of social support (41 mothers; 97.6%) after finishing the program, while in the control group, 27 mothers (64.3%) perceived a high level of social support, 14 mothers (33.3%) a medium level of perceived social support and 1 mother (2.4%) a low level of perceived social support (Table 14).

Table 15: Perceived social support level of adolescent mothers

Perceived social support level	Intervention N (%)	Control N (%)
6-month after delivery		
Low	0(0)	1(2.4)
Medium	1(2.4)	14(33.3)
High	41(97.6)	27(64.3)

4.1.5.5 Breastfeeding knowledge level of grandmothers

Breastfeeding knowledge was classified into 3 categories, including good breastfeeding knowledge (score=14–30), fair breastfeeding knowledge (score=7–13) and poor breastfeeding knowledge (score=0–6).

In the baseline evaluation of the invention group, 26 grandmothers (61.9%) had a fair level of breastfeeding knowledge, and 3 grandmothers (7.1%) had a poor level of breastfeeding knowledge; however, after 6 months, 40 grandmothers (95.2%) had a good level of breastfeeding knowledge. Meanwhile, in the control group, 23 grandmothers (54.8%) had a reportedly good level of breastfeeding knowledge during the baseline evaluation, which apparently decreased to 21 grandmothers (50%) by the end of the program (Table 15).

Table 16: Breastfeeding knowledge level of grandmothers

Knowledge level	**Intervention**	**Control**
	N (%)	**N (%)**
At base line		
Poor	3(7.1)	1(2.4)
Fair	26(61.9)	18(42.8)
Good	13(31.0)	23(54.8)
2-month after delivery		
Poor	1(2.4)	1(2.4)
Fair	6(14.3)	22(52.4)
Good	35(83.3)	19(45.2)
6-month after delivery		
Poor	0(0)	1(2.4)
Fair	2(4.8)	20(47.6)
Good	40(95.2)	21(50.0)

4.1.5.6 Attitude towards breastfeeding level of grandmothers

Attitudes toward breastfeeding were divided into 3 categories, including positive attitudes toward breastfeeding (score=55–57), neutral attitudes toward breastfeeding (score=35–54) and negative attitudes toward breastfeeding (score=15–34).

Twenty-eight grandmothers (66.7%) in the intervention group had a neutral attitude toward breastfeeding at the beginning of the study; after 6 months, most had a positive attitude toward breastfeeding (34 grandmothers; 81%). The control group had a neutral attitude toward breastfeeding over the course of the 3 evaluation periods, indicated by 32 (76.2%), 33 (78.6%) and 33 (78.6%) grandmothers, respectively, for each period, as shown in Table 16.

Table 17: Attitude towards breastfeeding level of grandmothers

Attitude level	Intervention N (%)	Control N (%)
At base line		
Negative	0(0)	1(2.4)
Neutral	28(66.7)	32(76.2)
Positive	14(33.3)	9(21.4)
2-month after delivery		
Neutral	8(19.0)	33(78.6)
Positive	34(81.0)	9(21.4)
6-month after delivery		
Neutral	8(19.0)	33(78.6)
Positive	34(81.0)	9(21.4)

4.1.5.7 Breastfeeding practice level of grandmothers

Breastfeeding practices of grandmothers were classified into 3 categories, including good breastfeeding practice (score=14–20), fair breastfeeding practice (score=7–13) and poor breastfeeding practice (score=0–6).

At 2 months after delivery, grandmothers in the intervention group had a good level of breastfeeding practice (36 grandmothers; 85.7%), yet by the end of the program, good practices were exhibited by only 22 grandmothers (52.4%). Even so, this still represents a decent level of good breastfeeding practices. In term of the control group, at 2 months after delivery, grandmothers exhibited poor and fair levels of breastfeeding practices (50% and 50%, respectively), and 6 months after delivery, they had poor and fair levels of breastfeeding practices, exhibited by 36 (85.7%) and 6 (14.3%) grandmothers, respectively, as shown in Table 17.

Table 18: Breastfeeding practice level of grandmothers

Practice level	**Intervention**	**Control**
	N (%)	**N (%)**
2-month after delivery		
Poor	3(7.1)	21(50.0)
Fair	3(7.1)	21(50.0)
Good	36(85.8)	0(0)
6-month after delivery		
Poor	15(35.7)	36(85.7)
Fair	5(11.9)	6(14.3)
Good	22(52.4)	0(0)

4.2 TESTING THE EFFECT OF THE ELESSS IN GRANDMOTHERS TO IMPROVE EXCLUSIVE BREASTFEEDING

4.2.1 The effect of program on the rate of exclusive breastfeeding

4.2.1.1 Relationship of breastfeeding pattern at 7, 14 days, 1, 2,3,4,5, and 6 months after delivery between the intervention and the control groups

The differences in the breastfeeding patterns between the intervention and the control groups were documented at days 7 and 14 and from 1 to 6 months following birth; these are summarized at following and in Table 18.

Day 7. The intervention group had a higher rate of exclusive breastfeeding than the control group. Forty mothers (95.24%) in the intervention group exclusively breastfeed, whereas in the control group the exclusive breastfeeding rate was 4 (9.52% of mothers). Most of the control group selected to feed their infants with breast milk and water (52.38%). Only 1 (2.38%) and 4 mothers (9.52%) in the intervention and control groups, respectively, selected to feed their infants with formula.

Day 14. Most of the intervention group fed their infants with only breast milk (39 mothers; 92.86%). The control group had the same exclusive breastfeeding rate at day 7 (9.25%), although some mothers (26.19%) began to feed their infants with formula milk.

Month 1. The intervention group had a higher rate of exclusive breastfeeding than the control group (90.48% vs. 7.14%). The rate of predominant breastfeeding, complementary feeding and formula milk (NBF) in the intervention group was 2 (4.76%), 1 (2.38%) and 1 (2.38%) and in the control group was 16 (38.10%), 8 (19.05%) and 15 (35.71%), respectively.

Month 2. The rate of exclusive breastfeeding in the intervention group was higher than the control group, but some of the intervention group began to feed their infant with the formula milk (NBF), increasing from 1 mother (2.38%) to 3 mothers (7.14%). In the control group, there was a gradual increase in the rate of NBF.

Month 3. The rate of exclusive breastfeeding in the intervention group dramatically decreased from month 2 (69.05%) to 52.38%, but a higher rate of exclusive breastfeeding was still found in comparison with the control group. Almost half of the control group (47.62%) chose formula milk (NBF) to feed their babies.

Month 4. The rate of exclusive breastfeeding in the intervention group dramatically decreased at 3 months after delivery. The exclusive breastfeeding rate of the intervention and the control groups was 15 (35.71%) and 2 (4.76%), respectively. The rate of NBF of the intervention and the control groups was 10 (23.81%) and 23 (54.76%), respectively.

Month 5. The rate of NBF in the intervention group (12; 28.57%) showed a gradual increasing trend, similar to the control group (27; 64.29%). The exclusive breastfeeding rate in the intervention and the control groups was 13 (30.95%) and 2 (4.76%), respectively.

Month 6. The intervention group had a higher rate of exclusive breastfeeding than the control group. Twelve mothers (28.57%) in the intervention group continued to exclusively breastfeed in comparison with only 2 mothers (4.76%) in the control group. The rate of predominant breastfeeding, complementary feeding and formula milk (NBF) in the intervention group was 7 (16.67%), 10 (23.81%) and 13 (30.95%) and in the control group was 2 (4.76%), 11 (26.19%) and 27 (64.29%), respectively.

Table 19: Relationship of breastfeeding pattern at 7, 14 days, 1, 2, 3, 4, 5, and 6 months after delivery of adolescent mothers between the intervention and the control groups (*n*=84)

Duration	Breastfeeding pattern	Intervention group(*n*=42) N (%)	Control group (*n*=42) N (%)
At 7 day			
	EBF	40 (95.24)	4 (9.52)
	PDBF	1 (2.38)	22 (52.38)
	CF	0 (0.00)	12 (28.57)
	NBF	1 (2.38)	4 (9.52)
At 14 day			
	EBF	39 (92.86)	4 (9.52)
	PDBF	1 (2.38)	20 (47.62)
	CF	1 (2.38)	7 (16.67)
	NBF	1 (2.38)	11 (26.19)
At 1 month			
	EBF	38 (90.48)	3 (7.14)
	PDBF	2 (4.76)	16 (38.10)
	CF	1 (2.38)	8 (19.05)
	NBF	1 (2.38)	15 (35.71)

Duration	Breastfeeding pattern	Intervention group(*n*=42) N (%)	Control group (*n*=42) N (%)
At 2 month			
	EBF	29 (69.05)	3 (7.14)
	PDBF	5 (11.90)	11 (26.19)
	CF	5 (11.90)	10 (23.81)
	NBF	3 (7.14)	18 (42.86)
At 3 month			
	EBF	22 (52.38)	2 (4.76)
	PDBF	6 (14.29)	4 (9.52)
	CF	9 (21.43)	16 (38.10)
	NBF	5 (11.90)	20 (47.62)
At 4 month			
	EBF	15 (35.71)	2 (4.76)
	PDBF	6 (14.29)	2 (4.76)
	CF	11 (26.19)	15 (35.71)
	NBF	10 (23.81)	23 (54.76)
At 5 month			
	EBF	13 (30.95)	2 (4.76)
	PDBF	7 (16.67)	2 (4.76)
	CF	10 (23.81)	11 (26.19)
	NBF	12 (28.57)	27 (64.29)
At 6 month			
	EBF	12 (28.57)	2 (4.76)
	PDBF	7 (16.67)	2 (4.76)
	CF	10 (23.81)	11 (26.19)
	NBF	13 (30.95)	27 (64.29)

EBF: Exclusive breastfeeding, PDBF: Predominant breastfeeding, CF: Complementary feeding, and NBF: No breastfeeding

4.2.1.2. Comparison of the exclusive breastfeeding rate between intervention and control groups at distinct evaluation intervals after delivery.

At 6 months, the intervention group had a 28.6% rate of exclusive breastfeeding, while the control group had a 4.8% rate of exclusive breastfeeding; six times more mothers exclusively breastfeed in the intervention group in comparison with the control group. No statistically significant differences were found between the rate of exclusive breastfeeding and non-exclusive breastfeeding between the intervention and the control groups at days 7 and 14 and months 1, 2, 3, 4, 5 and 6 after delivery (p<0.001, <0.001, <0.001, <0.001, <0.001, <0.001, 0.002, 0.003, respectively), as shown in Table 19.

Table 20: Comparison of the exclusive breastfeeding rate at 7, 14 day 1-, 2-, 3-, 4-, 5-, and 6- month after delivery between the intervention and the control groups (n=84)

Duration	**Intervention N (%)**	**Control N (%)**	***p*- value**
At 7 day			< 0.001
EBF	40(95.2)	4(9.5)	
NO EBF	2(4.8)	38(90.5)	
At 14 day			< 0.001
EBF	39(92.9)	4(9.5)	
NO EBF	3(7.1)	38(90.5)	
1-month			< 0.001
EBF	38(90.5)	3(7.1)	
NO EBF	4(9.5)	39(92.9)	
2-month			< 0.001
EBF	29(69.0)	3(7.1)	
NO EBF	13(31.0)	39(92.9)	
3-month			< 0.001
EBF	22(52.4)	2(4.8)	
NO EBF	20(47.6)	40(95.2)	
4-month			< 0.001
EBF	15(35.7)	2(4.8)	

NO EBF	27(64.3)	40(95.2)	
5-month			0.002
EBF	13(31.0)	2(4.8)	
NO EBF	29(69.0)	40(95.2)	
6-month			0.003
EBF	12 (28.6)	2 (4.8)	
NO EBF	30 (71.40)	40 (95.20)	

*Significant at p-value < 0.05, using Chi-square test

4.2.1.3 Exclusive breastfeeding duration

The median duration of exclusive breastfeeding in the intervention and the control groups were 90 (IQR= 150) and 0.00 (IQR= 0) days, respectively. There was a statistically significant difference of exclusive breastfeeding duration between the intervention and the control group (U = 127.5, p <0.001) by Mann-Whitney U test. (Table 20)

Table 21: Comparison of the exclusive breastfeeding duration between the intervention and the control groups after delivery at 6 months by Mann-Whitney U test

Duration	**Intervention Median(IQR) Min-Max**	**Control Median(IQR) Min-Max**	**Mann-Whitney U**	**p-value**
Duration of exclusive breastfeeding (days)	90(150) 0-180	0.00(0) 0-180	127.5	< 0.001

4.2.1.4 The distribution of exclusive breastfeeding duration between the intervention and the control groups.

The number of adolescent mothers who exclusively breastfeed in the intervention group was higher than the control group. In the intervention group, 40,

39, 38, 29, 22, 15, 13 and 12 adolescent mothers were exclusively breastfeeding at 7, 14, 30, 60, 90, 120, 150 and 180 days after delivery, respectively. For the control group, 4, 3 and 2 adolescent mothers were exclusively breastfeeding at 14, 60 and 180 days after delivery, respectively, as shown in Table 21 and Figure 4.

Table 22: Duration of exclusive breastfeeding between the intervention and the control groups

Duration of exclusive breastfeeding (days)	Intervention group (N=42)	Control group (N=42)
Before 7 days	42	42
7	40	4
14	39	4
30	38	3
60	29	3
90	22	2
120	15	2
150	13	2
180	12	2

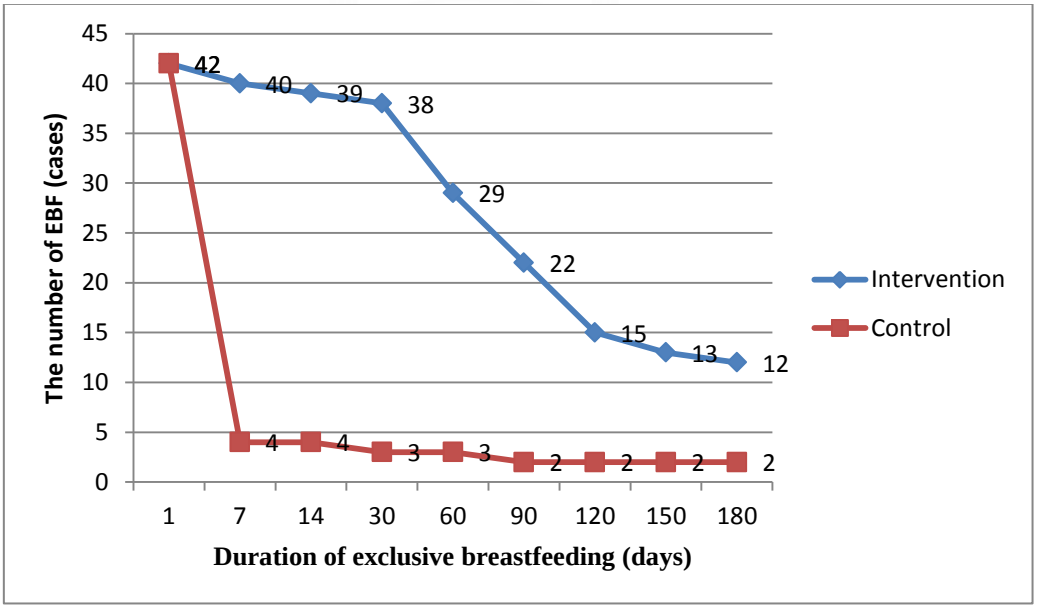

Figure 4: Distribution of exclusive breastfeeding duration between the intervention and the control groups

4.2.2 The effect of program on breastfeeding knowledge

4.2.2.1 The difference of breastfeeding knowledge of adolescent mothers between the intervention and the control groups at baseline, 2 month, and 6 month follow up by Repeated measure ANOVA

There was a statistically significant difference of breastfeeding knowledge between the intervention and the control groups ($p<0.001$). Among within the subject, there was a statistically significant difference between measurements ($p<0.001$). Interaction, there was a statistically significant difference between measurements of breastfeeding knowledge on group ($p<0.001$). (Table 22 and Figure 5)

Table 23: Repeated measure ANOVA of breastfeeding knowledge of adolescent mothers between the intervention and the control groups (n=84)

Source	SS	df	MS	F-test	*p*-value
Between subjects					
Intervention	51858.036	1	51858.036	4.172	< 0.001
Error	1019.151	82	12.429		
Within subjects					
time	700.310	1.309	534.888	130.536	< 0.001
Intervention x time	611.770	1.309	467.262	114.032	< 0.001
Error	439.921	107.360	4.098		

SS: Sum of Squares

df: Degree of freedom

MS: Mean Squares

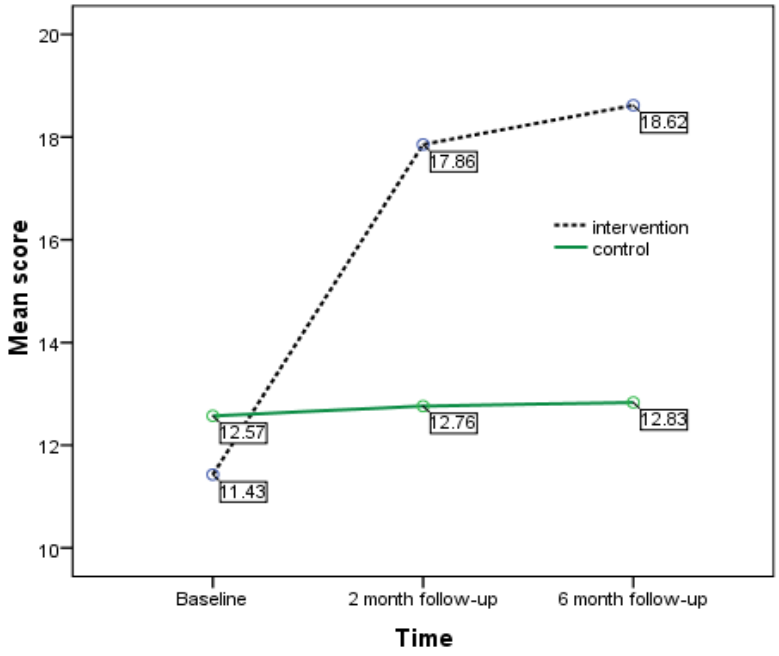

Figure 5: Change overtime on breastfeeding knowledge in the intervention and the control groups

There was a statistically significant difference between the intervention and the control groups of breastfeeding knowledge at 2- and 6- month follow up (p<0.001 and p<0.001, respectively; Table 23)

Table 24: Pairwise comparisons of the different measurements of breastfeeding knowledge of adolescent mothers between the intervention and the control groups (*n*=84)

Time	**Group (i)**	**Group (j)**	**Mean difference (i-j)**	**SE**	***p*-value**	**95% CI of mean difference[(b)]**	
						upper	lower
Baseline	Intervention	Control	-1.143	.698	.105	-2.531	.245
2nd month	Intervention	Control	5.095*	.437	< 0.001	4.226	5.964
6th month	Intervention	Control	5.786*	.412	< 0.001	4.967	6.605

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

In the intervention group, there were statistically significant differences in breastfeeding knowledge upon comparing the baseline level of knowledge with that of the 2-month follow up as well as between the baseline point and the 6-month follow up and between the 2-month and 6-month follow ups (p<0.001, <0.001 and <0.001, respectively); meanwhile, in the control group no significant difference were found upon comparing the three evaluation periods as shown in Table 24.

Table 25: Pairwise comparisons of the different measurements of breastfeeding knowledge in the time of measurements of adolescent mothers in the intervention and the control groups (*n*=84)

Group	Time (i)	Time (j)	Mean difference (i-j)	SE	*p*-value	95% CI of mean difference[(b)]	
						upper	lower
Intervention	Baseline	2nd month	-6.429*	.416	< 0.001	-7.446	-5.411
	Baseline	6th month	-7.190*	.418	< 0.001	-8.213	-6.168
	2nd month	6th month	-.762*	.187	< 0.001	-1.219	-.305
Control	Baseline	2nd month	-.190	.416	1.000	-1.208	.827
	Baseline	6th month	-.262	.418	1.000	-1.284	.760
	2nd month	6th month	-.071	.187	1.000	-.528	.386

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

4.2.2.2 The difference of breastfeeding knowledge of grandmothers between the intervention and the control groups at baseline, 2 month, and 6 month follow up by Repeated measure ANOVA

There was a statistically significant difference of breastfeeding knowledge between the intervention and the control groups ($p<0.001$). Among within the subject, there was a statistically significant difference between measurements ($p<0.001$). Interaction, there was a statistically significant difference between measurements of breastfeeding knowledge on group ($p<0.001$; Table 25 and Figure 6)

Table 26: Repeated measure ANOVA of breastfeeding knowledge of grandmothers between the intervention and the control groups (*n*=84)

Source	SS	df	MS	F-test	*p*-value
Between subjects					
Intervention	50858.730	1	50858.730	2.052	<0.001
Error	2032.794	82	24.790		
Within subjects					
time	387.175	1.575	245.798	40.098	<0.001
Intervention x time	496.381	1.575	315.128	51.407	<0.001
Error	791.778	129.164	6.130		

SS: Sum of Squares

df: Degree of freedom

MS: Mean Squares

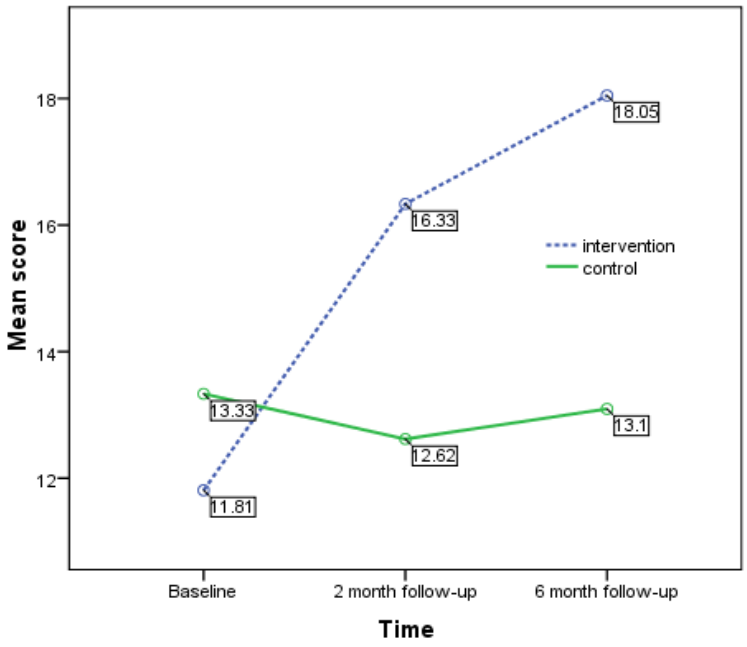

Figure 6: Change overtime on breastfeeding knowledge in the intervention and the control groups

There was a statistically significant difference between the intervention and the control groups of breastfeeding knowledge at 2- and 6- month follow up ($p<0.001$ and $p<0.001$, respectively). (Table 26)

Table 27: Pairwise comparisons of the different measurements of breastfeeding knowledge of grandmothers between the intervention and the control groups (*n*=84)

Time	**Group (i)**	**Group (j)**	**Mean difference (i-j)**	**SE**	***p*-value**	**95% CI of mean difference(b)**	
						upper	lower
Baseline	Intervention	Control	-1.524	.824	.068	-3.162	.114
2nd month	Intervention	Control	3.714*	.768	< 0.001	2.187	5.242
6th month	Intervention	Control	4.952*	.610	< 0.001	3.738	6.167

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

In the intervention group, there were statistically significant differences in breastfeeding knowledge upon comparing the baseline level of knowledge with that of the 2-month follow up as well as between the baseline point and the 6-month follow up and between the 2-month and 6-month follow ups (p<0.001, <0.001 and <0.001, respectively); meanwhile, in the control group no significant difference were found upon comparing the three evaluation periods as shown in Table 27.

Table 28: Pairwise comparisons of the different measurements of breastfeeding knowledge in the time of measurements of grandmothers in the intervention and the control groups (*n*=84)

Group	Time (i)	Time (j)	Mean difference (i-j)	SE	*p*-value	95% CI of mean difference[(b)]	
						upper	lower
Intervention	Baseline	2nd month	-4.524*	.548	<0.001	-5.864	-3.184
	Baseline	6th month	-6.238*	.527	<0.001	-7.527	-4.950
	2nd month	6th month	-1.714*	.333	<0.001	-2.529	-.899
Control	Baseline	2nd month	.714	.548	.589	-.626	2.054
	Baseline	6th month	.238	.527	1.000	-1.050	1.527
	2nd month	6th month	-.476	.333	.471	-1.291	.339

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

4.2.3 The effect of program on attitude towards breastfeeding

4.2.3.1 The difference of attitude towards breastfeeding of adolescent mothers between the intervention and the control groups at baseline, 2 month, and 6 month follow up by Repeated measure ANOVA

There was a statistically significant difference of attitude towards breastfeeding between the intervention and the control groups (p<0.001). Among within the subject, there was a statistically significant difference between measurements (p<0.001). Interaction, there was a statistically significant difference between measurements of attitude toward breastfeeding on group (p<0.001) as shown in Table 28 and Figure 7.

Table 29: Repeated measure ANOVA of attitude towards breastfeeding of adolescent mothers between the intervention and the control groups (*n*=84)

Source	SS	df	MS	F-test	*p*-value
Between subjects					
Intervention	756152.444	1	756152.444	9.735	<0.001
Error	6369.222	82	77.673		
Within subjects					
time	825.294	1.779	463.851	61.612	<0.001
Intervention x time	719.643	1.779	404.471	53.724	<0.001
Error	1098.397	145.896	7.529		

SS: Sum of Squares

df: Degree of freedom

MS: Mean Squares

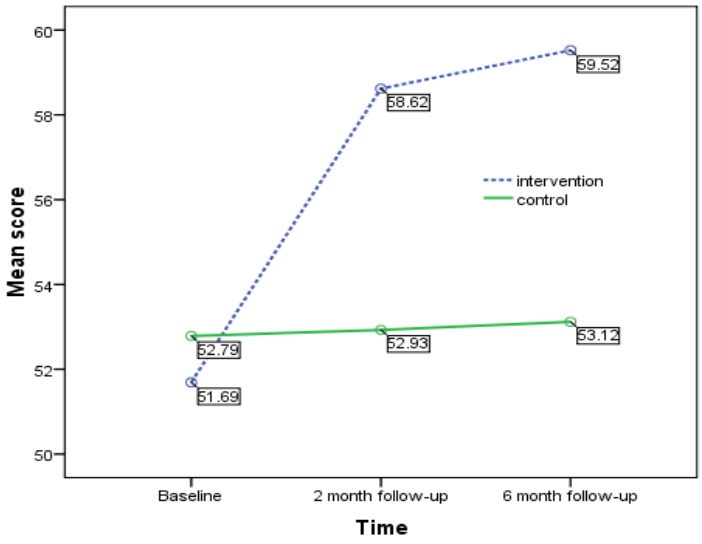

Figure 7: Change overtime on attitude towards breastfeeding in the intervention and the control groups

There was a statistically significant difference between the intervention and the control groups of attitude towards breastfeeding at 2- and 6- month follow up (p<0.001 and p<0.001, respectively; Table 29).

Table 30: Pairwise comparisons of the different measurements of attitude towards breastfeeding of adolescent mothers between the intervention and the control groups (*n*=84)

Time	**Group (i)**	**Group (j)**	**Mean difference (i-j)**	**SE**	***p*-value**	**95% CI of mean difference[(b)]**	
						upper	lower
Baseline	Intervention	Control	-1.095	1.258	.387	-3.598	1.408
2nd month	Intervention	Control	5.690*	1.218	<0.001	3.268	8.113
6th month	Intervention	Control	6.405*	1.127	<0.001	4.162	8.648

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

Attitude toward breastfeeding, there were statistically significant difference between at baseline point and 2- month follow up, and baseline and 6- month follow up of the intervention group (p<0.001, and <0.001, respectively) while the control group were no significant difference all 3 times; Table 30).

Table 31: Pairwise comparisons of the different measurements of attitude toward breastfeeding in the time of measurements of adolescent mothers in the intervention and the control groups (*n*=84)

Group	**Time (i)**	**Time (j)**	**Mean difference (i-j)**	**SE**	***p*-value**	**95% CI of mean difference[(b)]**	
						upper	lower
Intervention	Baseline	2nd month	-6.929*	.581	<0.001	-8.348	-5.509
	Baseline	6th month	-7.833*	.637	<0.001	-9.390	-6.277
	2nd month	6th month	-.905	.462	.161	-2.035	.225
Control	Baseline	2nd month	-.143	.581	1.000	-1.562	1.277
	Baseline	6th month	-.333	.637	1.000	-1.890	1.223
	2nd month	6th month	-.190	.462	1.000	-1.320	.939

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

4.2.3.2 The difference of attitude towards breastfeeding of grandmothers between the intervention and the control groups at baseline, 2 month, and 6 month follow up by Repeated measure ANOVA

There was a statistically significant difference of attitude towards breastfeeding between the intervention and the control groups (p<0.001). Among within the subject, there was a statistically significant difference between measurements (p<0.001). Interaction, there was a statistically significant difference between measurements of attitude toward breastfeeding on group (p<0.001; Table 31 and Figure 8).

Table 32: Repeated measure ANOVA of attitude towards breastfeeding of grandmother between the intervention and the control groups (n=84)

Source	SS	df	MS	F-test	*p*-value
Between subjects					
Intervention	734724.004	1	734724.004	7.262	< 0.001
Error	8296.325	82	101.175		
Within subjects					
time	616.056	2	308.028	40.827	< 0.001
Intervention x time	487.960	2	243.980	32.338	< 0.001
Error	1237.317	164	7.545		

SS: Sum of Squares

df: Degree of freedom

MS: Mean Squares

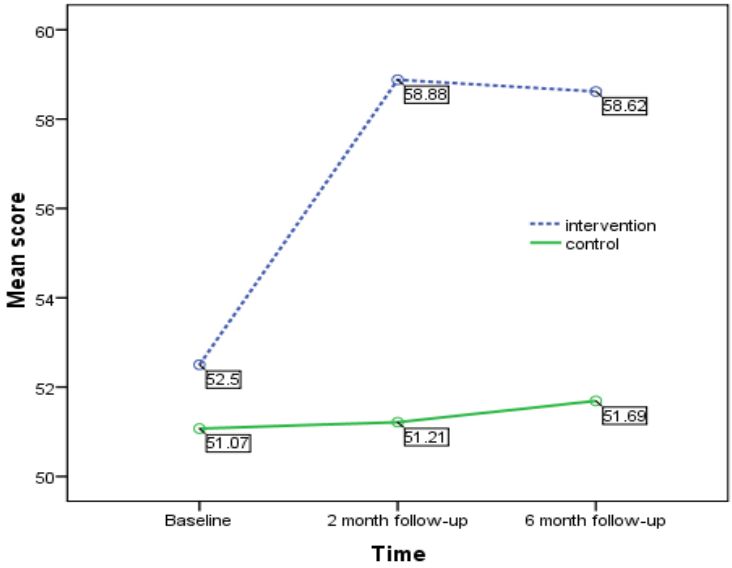

Figure 8: Change overtime on attitude towards breastfeeding in the intervention and the control groups

There was a statistically significant difference between the intervention and the control groups of attitude toward breastfeeding at 2- and 6- month follow up (p<0.001 and p<0.001, respectively; Table 32).

Table 33: Pairwise comparisons of the different measurements of attitude toward breastfeeding of grandmothers between the intervention and the control groups (n=84)

Time	**Group (i)**	**Group (j)**	**Mean difference (i-j)**	**SE**	***p*-value**	**95% CI of mean difference[(b)]**	
						upper	lower
Baseline	Intervention	Control	1.429	1.332	.287	-1.221	4.078
2nd month	Intervention	Control	7.667*	1.428	< 0.001	4.827	10.507
6th month	Intervention	Control	6.929*	1.313	< 0.001	4.317	9.541

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

Attitude toward breastfeeding, there were statistically significant difference between at baseline point and 2- month follow up, and baseline and 6- month follow up of the intervention group (p<0.001, and <0.001, respectively); meanwhile the control group no significant difference found upon comparing the three evaluation periods. (Table 33)

Table 34: Pairwise comparisons of the different measurements of attitude toward breastfeeding in the time of measurements of grandmothers in the intervention and the control groups (n=84)

Group	Time (i)	Time (j)	Mean difference (i-j)	SE	P-value	95% CI of mean difference[(b)]	
						upper	lower
Intervention	Baseline	2nd month	-6.381*	.648	< 0.001	-7.965	-4.797
	Baseline	6th month	-6.119*	.621	< 0.001	-7.636	-4.602
	2nd month	6th month	.262	.522	1.000	-1.014	1.538
Control	Baseline	2nd month	-.143	.648	1.000	-1.727	1.441
	Baseline	6th month	-.619	.621	.964	-2.136	.898
	2nd month	6th month	-.476	.522	1.000	-1.752	.800

Based on estimated marginal means

*The mean difference is significant at the 0.005 level

[b] Adjustment for multiple comparison: Bonferroni

4.2.4 The effect of program on breastfeeding practice

4.2.4.1 Comparison of adolescent mothers breastfeeding practice at 2 month and 6 month after delivery within the intervention and the control groups

In the intervention group, the average score of breastfeeding practice of adolescent mothers at 2- month and 6- month after delivery were 63.02±13.23 and 47.74±19.37, respectively. There was a statistically significant difference between 2 times of breastfeeding practice (p<0.001). And the control group, the average score of breastfeeding practice at 2- month and 6- month after delivery were 40.9±16.67 and

31.31±14.18, respectively. There was a statistically significant difference between 2 times of breastfeeding practice (p<0.001; Table 34)

Table 35: Comparison score of breastfeeding practice at 2 month and 6 month follow up of adolescent mothers within the intervention and the control groups (n=84)

Group	At 2 month (n=42)	At 6 month (n=42)	*t*	*p*-value
Intervention			5.799	< 0.001*
Mean (SD)	63.02 (13.23)	47.74 (19.37)		
Min-max	20 - 78	20 - 75		
Control			5.007	< 0.001*
Mean (SD)	40.9 (16.67)	31.31 (14.18)		
Min-max	21 - 70	20 - 66		

*Significant at p-value < 0.05, using paired t- test

4.2.4.2 Comparison of adolescent mothers breastfeeding practice at 2 month and 6 month after delivery between the intervention and the control groups

Upon comparing the mean score of breastfeeding practices of adolescent mothers between the intervention (63.02±13.23) and the control (40.9±16.67) groups at 2 months after delivery, a statistically significant difference was found (p<0.001). At 6 month after delivery, the mean breastfeeding practice score of the intervention group was 47.74±19.37 and of the control was 31.31±14.18, also statistically significant (p<0.001; Table 35).

Table 36: Comparison score of breastfeeding practice at 2 month and 6 month follow up in adolescent mothers between the intervention and the control group (n=84)

Time of data collection	Intervention (*n*=42)	Control (*n*=42)	*t*	*p*-value
2 month follow-up			6.733	< 0.001*
Mean (SD)	63.02 (13.23)	40.9 (16.67)		
Min-max	20 - 78	21 - 70		
6 month follow-up			4.434	< 0.001*
Mean (SD)	47.74 (19.37)	31.31 (14.18)		
Min-max	20 - 75	20 - 66		

*Significant at p-value < 0.05, using independent t-test

4.2.4.3 Comparison of grandmothers breastfeeding practice at 2 month and 6 month after delivery within the intervention and the control groups

In the intervention group, the average score of breastfeeding practice grandmothers at 2- month and 6- month after delivery were 17.38±4.38 and 11.79 ±6.40, respectively. There was a statistically significant difference between 2 times of breastfeeding practice ($p<0.001$). And the control group, the average score of breastfeeding practice at 2 month and 6 month after delivery were 40.9 ± 16.67 and 31.31 ± 14.18, respectively. There was a statistically significant difference between 2 times of breastfeeding practice ($p<0.001$; Table 36)

Table 37: Comparison scores of breastfeeding practice at 2 month and 6 month follow up of grandmothers within the intervention and within the control groups (*n*=84)

Group	At 2 month (*n*=42)	At 6 month (*n*=42)	*t*	*p*-value
Intervention			6.541	< 0.001*
Mean ± SD	17.38 ± 4.38	11.79 ± 6.40		
Min - Max	3 - 20	3 - 20		
Control			6.597	< 0.001*
Mean ± SD	7.43 ± 2.98	4.64 ± 2.39		
Min - Max	3 - 13	2 - 13		

*Significant at p-value < 0.05, using paired t- test

4.2.4.4 Comparison of grandmothers breastfeeding practice at 2 month and 6 month after delivery between the intervention and the control groups

Upon comparing the mean score of breastfeeding practices of grandmothers between the intervention (17.38±4.38) and the control (7.43±2.98) groups at 2 months after delivery, a statistically significant difference was found (p<0.001). At 6 month after delivery, the mean breastfeeding practice score of the intervention group was 11.79±6.40 and of the control was 4.64 ± 2.39, also statistically significant (p<0.001; Table 37).

Table 38: Comparison scores of breastfeeding practice at 2 month and 6 month follow up in grandmothers between the intervention and the control group (*n*=84)

Time of data collection	Intervention (n=42)	Control (n=42)	*t*	*p*-value
2 month follow- up			12.156	< 0.001*
Mean ± SD	17.38 ± 4.38	7.43 ± 2.98		
6 month follow- up			6.767	< 0.001*
Mean ± SD	11.79 ± 6.40	4.64 ± 2.39		

*Significant at p-value < 0.05, using independent t-test

4.2.5 The effect of program on perceived of social support

Score of perceived social support in adolescent mothers who grandmothers received the ELESSS program, in the intervention (55.36±5.13) and the control (43.74 ±5.54) groups were a statistically significant difference between two groups (p< 0.001; Table 38)

Table 39: Comparison score of perceived social support of adolescent mothers between the intervention and the control groups (n=84)

Variable	Intervention (n=42)	Control (n=42)	*t*	*p*-value
Perceived social support (score)			9.964	< 0.001*
Mean (SD)	55.36 (5.13)	43.74 (5.54)		
Min-max	41 - 60	27 - 55		

*Significant at p-value < 0.05, using independent t-test

CHAPTER V
DISCUSSION

This chapter includes the summary of findings and the discussion. The discussion of the study will describe the effect of the ELESSS program on increasing the rate of exclusive breastfeeding in adolescent mothers, breastfeeding knowledge, attitudes toward breastfeeding, the breastfeeding practice of adolescent mothers and grandmothers, and the perceived social support for adolescent mothers. The findings are also supported by comparing and contrasting with previous relevant studies. Finally, the recommendations for future research will be presented.

5.1 SUMMARY OF RESEARCH FINDING

The ELESSS program aimed to improve the rates and duration of exclusive breastfeeding as well as breastfeeding knowledge, attitudes toward breastfeeding, breastfeeding practice, and the perceived social support of adolescent mothers. The ELESSS program was implemented with grandmothers in the intervention group, including a two-day training course about breastfeeding based on experiential learning, empowerment, and social support theories around 32 gestational age of adolescent mothers, with boosters at two and four months after the adolescent mothers give birth. Grandmothers in the control group received routine breastfeeding knowledge. There were a total of 168 eligible adolescent mothers and grandmothers who met the criteria, and these were divided into two groups of 42 pairs of adolescent mothers and grandmothers.

The findings showed that most variables among the adolescent mothers and grandmothers were comparable between the intervention hospital and the control hospital. Both hospitals had adolescent mothers aged 18 years old. Most adolescent mothers had completed junior high school, were unemployed, and had no income. They were married and were experiencing pregnancy for the first time. The intervention and the control hospitals had gestational ages around 16 and 14 weeks, respectively, when the mothers and their babies came to visit the antenatal care clinic.

The mode of delivery between the two groups, in terms of normal delivery versus caesarean section, did not show a statistically significant difference. Nor did the average infant birth weight in either group show a statistically significant difference. The scores of mean breastfeeding knowledge and attitude toward breastfeeding showed no statistically significant difference between adolescent mothers at either the intervention or the control hospital. It can be concluded that at the baseline, the adolescent mothers' characteristics were not significantly different between the groups at the beginning of the study.

With respect to the grandmothers, both hospitals had grandmothers about 50 years old. Most of the babies' grandmothers were the mothers of the adolescent mothers. They had completed primary school and worked as employees. Neither group had ever had experience with exclusive breastfeeding at six months, and they intended to feed their grandchildren with breast milk and water. The scores of mean breastfeeding knowledge and attitude toward breastfeeding showed no statistically significant difference between the grandmothers at the intervention and the control hospitals. It can be concluded that at the baseline, the grandmothers' characteristics were not significantly different between the two groups at the beginning of the study.

The effects of the ELESSS program were monitored according to an interview scheduled at three time-points, namely, at baseline and at two months and six months after delivery. Five significant findings were obtained:

1. The rates and duration of exclusive breastfeeding: Adolescent mothers in the intervention group had a significantly higher rate of exclusive breastfeeding at six months than adolescent mothers in the control group (p=0.003). The rates of exclusive breastfeeding at six months were 28.6% and 4.8%, respectively, in the intervention and the control groups. Thus, the exclusive breastfeeding rate of the intervention group was six times higher than that of the control group. The median of exclusive breastfeeding duration in the intervention group was also longer than in the control group (90 (IQR=150) days vs. 0.00 (IQR=0) days). There was a statistically significant difference between the two groups with respect to the duration of exclusive breastfeeding ($p<0.001$; Table 20).

2. Breastfeeding knowledge: For adolescent mothers, a significant difference in breastfeeding knowledge between the intervention and the control groups (p<0.001) was seen at six months after delivery. For adolescent mothers whose grandmothers went through the ELESSS program, there was a gradual increase in breastfeeding knowledge from two to six months after delivery, while the breastfeeding knowledge of adolescent mothers from the control group remained consistent from baseline to six months after delivery. Similarly, grandmothers in the intervention group had significantly higher breastfeeding knowledge than grandmothers in the control group (p<0.001). After grandmothers in the intervention group went through the ELESSS program, there was a gradual increase in breastfeeding knowledge from two to six months after delivery, while the breastfeeding knowledge of grandmothers from the control group remained consistent from baseline to six months after delivery.

3. Attitude toward breastfeeding: For adolescent mothers, there was a statistically significant difference in attitude toward breastfeeding at six months after delivery between the intervention and the control groups (p<0.001). For adolescent mothers whose grandmothers went through the ELESSS program, there was a gradual positive increase in attitude toward breastfeeding from two to six months after delivery, while the attitude of adolescent mothers from the control group toward breastfeeding remained consistent from baseline to six months after delivery. Likewise, grandmothers in the intervention group had a significantly more positive attitude toward breastfeeding at six months after delivery than grandmothers in the control group (p<0.001). After grandmothers in the intervention group went through the ELESSS program, there was a gradual increase in positive attitude toward breastfeeding from baseline to six months after delivery, whereas grandmothers from the control group retained a consistent attitude toward breastfeeding from baseline to six months after delivery.

4. Breastfeeding practice: Adolescent mothers whose grandmothers went through the ELESSS program had a significantly more consistent breastfeeding practice at two months and six months after delivery than adolescent mothers in the control group (p<0.001 in both groups). Similarly, grandmothers in the intervention

group had a significantly more consistent breastfeeding practice at two and six months after delivery than grandmothers in the control group ($p<0.001$ in both groups).

5. Perceived social support: Adolescent mothers in the intervention group had a significantly higher perceived social support at six months after delivery than adolescent mothers in the control group ($p<0.001$).

5.2 DISCUSSION

The results of the study were as follows.

5.2.1 The rate and duration of exclusive breastfeeding

The results of the study showed that adolescent mothers in the intervention group had a significantly higher rate of exclusive breastfeeding at six months than adolescent mothers in the control group ($p=0.003$). The rate of exclusive breastfeeding of the intervention group was six times higher than the rate for the control group. Thus, the hypothesis of the study was supported, as it had been hypothesized that adolescent mothers whose grandmothers participated in the ELESSS programs would show significant improvement in the rate of exclusive breastfeeding. The median of exclusive breastfeeding duration in the intervention and the control groups was 90 days (IQR =150) and 0 (IQR=0) days, respectively. There was a statistically significant difference between the groups with respect to the duration of exclusive breastfeeding ($p<0.001$). It can be concluded that the effect of the ELESSS program caused the different outcomes between the group of adolescent mothers, whose grandmothers participated in the ELESSS program along with having routine, standard breastfeeding knowledge and the control group of adolescent mothers, who received only routine, standard breastfeeding knowledge. The exclusive breastfeeding rate in the intervention group was higher than that in the control group not only at six months but also at every scheduled interview time-point (Table 19).

The rate of exclusive breastfeeding in the intervention group was higher than that in the control group. The explanation may be that the grandmothers who participated in the ELESSS program obtained knowledge about the benefits of breastfeeding, the problems with and barriers to exclusive breastfeeding, and the

methods of feeding and caring for their grandchildren through attending the experiential learning group with other grandmothers and the researcher. The experiential learning described by David Kolb [55], the empowerment of Gibson [57], and the social support described by House [52] were applied to the program.

Experiential learning consists of four steps, comprising four steps of empowerment. This program is an education method for the exchange of knowledge and opinions. During the group session, the grandmothers had opportunities to provide information and to ask questions to provide better understanding. The members had opportunities to express opinions and feelings while exchanging experiences with one another, receiving support or opposition from the group and receiving accurate advice from the researcher, who served as the group moderator. Thus, the sample group's participants were made aware that some of their thoughts or beliefs were incorrect, and they connected what they had learned with existing experiences. The researcher also provided them with new breastfeeding knowledge and breastfeeding policy to promote exclusive breastfeeding, as most of the grandmothers had had their children in the 1970s, 1980s, or 1990s, a time when very few Thai women exclusively breastfed. After the grandmothers participated in the program, they recognized the importance of breastfeeding and of their own roles, so they were able to support the adolescent mothers' breastfeeding.

Some studies have supported the role of experiential learning in increasing the rate or duration of breastfeeding. For example, Reeve et al. (2004) found that using experiential learning to support women's choices about infant feeding increasing the rates of prolonged breastfeeding [56]. Kang et al. (2008) researched the use of empowerment in postpartum mothers and found that a breastfeeding empowerment program increased the rate of breastfeeding; Kuptakul et al. (2010) study of knowledge-sharing practices and empowerment strategies for pregnant women also revealed increasing rates and duration of exclusive breastfeeding [24, 58]. The present study is similar to a previous research paper that found that counselling sessions for adolescent mothers and grandmothers increased the exclusive breastfeeding duration longer in the intervention group than in the control group [133]. Ratisunthorn et al. (2014) revealed the effects of empowerment for adolescent mothers after

implementing the program, and the exclusive breastfeeding duration in the intervention group was statistically longer than in the control group ($p < 0.01$) [128]. But this finding is inconsistent with Meglio et al. (2010) who conducted a randomized controlled trial project, "Telephone Peer Support," with adolescent mothers; these researchers found that the "any breastfeeding" duration did not differ significantly between the groups [129].

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that all infants worldwide should breastfeed exclusively until the first six months of life and should receive partial breastfeeding combined with an appropriate diet until the age of two or beyond [15]. The Eleventh National Health Development Plan (2012–2016) by the Ministry of Public Health, Thailand, set the operational goal of exclusive breastfeeding to be at least 50%. However, a comparison of the present study's rate of exclusive breastfeeding with the operational target for exclusive breastfeeding in this national plan shows that the findings of the present research are still lower than the target. Normally, the breastfeeding rate for adolescent mothers is quite low, from previous studies that found that adolescent mothers had lower rates of breastfeeding than adult mothers [30-33].

During the collection of the data of this study, the rate of exclusive breastfeeding decreased on a monthly basis, but the exclusive breastfeeding rate in the intervention group was still six times higher than that in the control group. The control group experienced a low rate of exclusive breastfeeding (4.8%), and at seven days after delivery, many fed their infants with breast milk and water (52.38%). The adolescent mothers explained that the grandmothers advised them to feed water, and they believed it was necessary, because the grandmothers believed the water would clean the mouth, relieve thirst, help relieve infant hiccups, and decrease the symptom of yellow eyes in the infants. They also began to feed supplementary food at seven days after delivery (28.57%). Although the adolescent mothers disagreed with the grandmothers, they did not want to contradict them. The grandmothers' reason for feeding the infants with rice or mashed bananas and with semi-solid food was that they wanted to provide the infants with familiar food, so that when these infants grew

up, they would not refuse these foods or find them difficult to eat. Another reason was to reduce the infants' crying and help them sleep through the night. Many studies have been consistent with the present study in showing the influence of grandmothers on breastfeeding [42-44, 46, 47].

5.2.2 Breastfeeding knowledge

The findings showed that the breastfeeding knowledge of adolescent mothers and grandmothers in the intervention group was greater than that of the adolescent mothers and grandmothers in the control group. This can be explained by the fact that after the grandmothers participated in the ELESSS program, they had much more knowledge; the researcher also gave them the breastfeeding handbook, which they could read and review when they hesitated or had a problem. The grandmothers also played a role as consultants to the adolescent mothers, which affected these mothers' knowledge as well.

Breastfeeding knowledge is one factor that predicts the rate and duration of breastfeeding [42]. A study by Grassley and Nelms (2008) found that grandmothers who had not breastfed or who had limited knowledge of breastfeeding approached their daughters' decisions to breastfeed in one of two ways [43]. One group of grandmothers did not oppose breastfeeding, even though they were unable to offer practical support, whereas the other group was described by their daughters as unsupportive, because they either tried to dissuade the daughters from breastfeeding or they quickly recommended feeding formula milk when breastfeeding was not going well. A study by Swanson et al. (2005) revealed that knowledge and social influences on adolescents' breastfeeding enhanced the breastfeeding rate [106].

Repeated measure ANOVA analysis in the present study showed that breastfeeding knowledge increased after the intervention. These results showed the effectiveness of the ELESSS program in increasing and maintaining the grandmothers' knowledge for six months. This is consistent with a previous study that found that health promotion increased the knowledge of exclusive breastfeeding in the intervention group, while the control group showed no difference [130]. Grassley et al. (2012) conducted the project, "A Grandmother's Tea," whose results showed that

knowledge scores in the intervention group were higher than in the control group [132]. This is consistent with Nwosu and Eke (2011) [130], who studied the effects of health promotion for 400 women divided into intervention and control groups. The program delivered teaching about the ten steps, demonstrating the correct sitting position, helping with sucking to ensure proper latching on, initiating baby's first feeding about half to one hour after birth, and information about colostrum and exclusive breastfeeding (only breast milk without water or glucose solution). The results showed an increase in knowledge and in the practice of exclusive breastfeeding in the intervention group, while the control group showed no change. The program helped to scale up the exclusive breastfeeding rate to 70% within nine months. On the other hand, Mekkamol et al. (2013) studied the effects of a breastfeeding promotion program. Their results showed that breastfeeding knowledge before and after implementing the program was not significantly different, but the exclusive breastfeeding rate at six months was 80% [125].

5.2.3 Attitude toward breastfeeding

The findings of the present study revealed that the intervention group (adolescent mothers/grandmothers) had a positive attitude toward breastfeeding, while the control group had a neutral attitude. During their participation the ELESS program, the grandmothers in the intervention group adjusted their breastfeeding attitudes and helped the adolescent mothers change their attitudes as well. Attitude toward breastfeeding is one factor associated with exclusive breastfeeding. A positive attitude toward breastfeeding can affect improvements in the exclusive breastfeeding rate and protect from inappropriate breastfeeding practice behavior. A study by Mossman (2008) found that adolescent mothers who had a positive attitude were more likely to have a longer duration of exclusive breastfeeding [98]. Positive breastfeeding attitudes can also lead to an increase in breastfeeding initiation [105]. This is in line with Phaiboonbunpot (2013) [126], who examined the effects of a breastfeeding promotion program for 30 postpartum mothers (16 subjects for the intervention group and 14 subjects for the control group) with respect to their knowledge, attitudes, and skill in breastfeeding. This study found that at two weeks postpartum, the intervention group had an attitude toward breastfeeding that was more positive than before

implementation of the program. The attitude toward breastfeeding was statistically significantly different between the two groups ($p<0.01$). The rate of exclusive breastfeeding in the intervention group was higher than that of the control group, at a statistically significant level ($p<0.01$).

However, this is inconsistent with Mekkamol et al. (2013), who studied the effect of a breastfeeding promotion program for 30 pairs of mothers and families and used a quasi-experimental, one group pretest-posttest design. The program was based on family-centered care (Phillips, 1996, 1998) and started after the mothers gave birth. It provided knowledge about breastfeeding, decision-making about breastfeeding, and taking care of their child as well as the family's role in supporting mothers. The results showed that attitudes toward breastfeeding before and after implementing the program were not significantly different, but the exclusive breastfeeding rate at six months was 80% [125]. Similarly, Grassley, Spencer, and Law's (2012) project, "A Grandmother's Tea," examined an intervention to facilitate grandmothers' knowledge and support of breastfeeding. There were 26 grandmothers in the intervention group and 23 grandmothers in the control group. The program had four components, and grandmothers in the intervention group attended only one part that lasted about 60 minutes. The results showed posttest knowledge scores in the intervention group to be higher than those in the control group. There was no statistically significant difference between the groups with respect to attitude or intent [132].

5.2.4 Breastfeeding practice

The results of the present study showed that correct breastfeeding practice was followed by the adolescent mothers and grandmothers in the intervention group at a greater frequency than by the adolescent mothers and grandmothers in the control group. This could be explained by the fact that the intervention group experienced the effect of the ELESSS program's stimulating the grandmothers to help the mothers put into practice the correct techniques for breastfeeding, for example, how to prepare their position, latching on, burping a baby, getting the infant off the breast, using a breast pump, and storing breast milk. Breastfeeding practice at six months after

delivery was followed less than it was at two months after delivery, corresponding to the dramatic decrease in the rate of exclusive breastfeeding. Naturally, the exclusive breastfeeding rate or the following of breastfeeding practice will gradually decrease when mothers have breastfed their children for a long time. Consequently, authorities should seek methods to promote breastfeeding sustainability and success in breastfeeding by following the recommendations of WHO and UNICEF; these say that mothers should breastfeed exclusively for the first six months of the baby's life and should engage in partial breastfeeding combined with an appropriate diet until the age of two or beyond [15].

The present study found that participants in the intervention group had a higher score for breastfeeding practice than those in the control group. This is consistent with previous research that studied the impact of health education on breastfeeding. The results of one study showed that a health education program produced a significant improvement in KAP regarding breastfeeding [135]. This is consistent with Ratisunthorn, Thaithae, and Bowanthammajak (2014), who revealed the effects of an empowerment program (for 60 adolescent mothers, 30 participants in each group) on breastfeeding behavior and exclusive breastfeeding duration. The findings showed that the scores for breastfeeding behavior in the intervention group after implementation were statistically higher than before implementation and were also higher than those of the control group ($p<0.001$). The exclusive breastfeeding duration in the intervention group was statistically longer than that of the control group ($p<0.01$) [128]. Handayani et al.'s study [131] indicated that mothers' high level of knowledge and highly positive attitudes toward breastfeeding influenced breastfeeding practice.

However, this is inconsistent with Yuangthong, Sawatphanit, and Deoisres (2012), who studied the effects of a breastfeeding promotion program for 60 first-time postpartum mothers (30 subjects in each group) on breastfeeding duration and behaviors. The results revealed that at four weeks after delivery, the participants in the intervention group had statistically significantly longer exclusive breastfeeding

duration than participants in the control group (p=0.002). Breastfeeding behaviors in both groups were not statistically significantly different (p=0.052).

5.2.5 Perceived social support

The present study found that adolescent mothers whose grandmothers participated in the ELESSS program had higher perceived social support than did adolescent mothers in the control group whose grandmothers did not participate in the program; the statistical significance was p<0.001. The findings show that the average score of the perceived social support level of the adolescent mothers in the intervention group was high (55.36), whereas the adolescent mothers in the control group had a medium perceived social support level (43.74).

These results can be explained by the fact that the grandmothers who participated in the ELESSS program had better skills and knowledge with which to support the adolescent mothers' breastfeeding. During the group meeting, the researcher emphasized the importance of breastfeeding and the methods by which the grandmothers could assist the breastfeeding adolescent mothers, based on social support. The social support distinctions developed by House [52] are as follows. 1) Emotional support: encourages the grandmothers to show support by listening to and helping the adolescent mothers take care of their infants and displaying love and care for the adolescent mothers and infants. The previous study noted that most adolescent mothers experience some problems initiating breastfeeding, and they might benefit from having someone take the time to listen to their concerns [102, 117]. Feldman-Winter and Shaikh found that adolescent mothers are also influenced by their families and their culture, so they need to feel cared for by their family and especially by their mothers and partners [31]. 2) Appraisal support: encourages the grandmothers to show support by providing positive feedback and encouraging the adolescent mothers' performance. 3) Information support: encourages the grandmothers to show support by advising and consulting with postpartum adolescent mothers on how to correctly breastfeed, including how to solve problems. 4) Instrumental support: encourages the grandmothers to show support by providing adolescent mothers with time, money, and labor.

After the grandmothers participated in the program, they recognized their own roles, so they were able to assist with the adolescent mother's needs. This is consistent with Chisuwan et al. [124], who examined the predictive power of support from husbands, grandmothers, and nurses for 77 mothers who took their children for vaccinations as six-month-old infants. The average exclusive breastfeeding duration was 90.60±50.10 days. The major reason for weaning from breastfeeding was incorrect advice from grandmothers. However, instrumental support from grandmothers was predictive of exclusive breastfeeding duration ($p=0.012$). [124]. Furthermore, Srisawat et al. [127] conducted research on the effects of grandmother support, and their results showed that first-time mothers perceived better social support from grandmothers in the intervention group than in the control group, and the mothers in the intervention group were satisfied with the grandmothers' participation in the study. Similarly, Bich, Hoa, and Malqvist (2014) conducted a quasi-experimental design with fathers as supporters, which aimed to determine the rate of exclusive breastfeeding at four and six months after birth. There were 251 couples in the intervention group and 241 couples in the control group. Fathers in the intervention group received breastfeeding education, counseling services, and home visits, while the mothers received routine service. The findings showed that the program increased the rate of exclusive breastfeeding at four months and six months, and there were statistically significant differences between the two groups at four months ($p<0.01$) and at six months ($p<0.001$) [136].

5.3 STRENGTH AND WEAKNESS

One strength of this study was the home visits after discharge from the hospital to assess breastfeeding practice. A telephone follow-up would not result in correct data, but a home visit would allow the real situation and practice of the mothers caring for their children to be seen, leading to more accurate data. A high response rate (100%) was another strength of this study.

One weakness of this study might have been the adolescent mothers' lack of intention to feed their child and a failure to allow them to provide a reason on the

questionnaire for their termination of exclusive breastfeeding or the initiation of weaning.

5.4 STUDY LIMITATION

1. This study used a quasi-experimental design. The participants in the intervention and the control group could not be randomly selected. Therefore, selection bias have may occurred. The findings also might not be applicable to other populations.

2. The participants were adolescent mothers and their mothers (the babies' grandmothers) in a rural area. The grandmothers generally had a low income, while the adolescent mothers had no income. The grandmothers had finished primary school, and the adolescent mothers finished junior high school. These results may not be transferable to other areas.

3. This study cannot be generalized to every hospital.

4. The study could not control for external co-intervention or external confounders such as the influence of information from local health providers on the control group or the influence of mass media. Rather, the study assumed that information from other resources for both the intervention and the control group was not different.

5.5 RECOMMENDATIONS

The ELESSS program displayed the effect of increasing the exclusive breastfeeding rate, the duration of breastfeeding, breastfeeding knowledge, attitudes toward breastfeeding, breastfeeding practice, and perceived social support. It should be adapted to regular education for mothers during the prenatal, delivery, and postpartum periods, and when they take their babies to a well-baby clinic for vaccinations. One result of the study may be that nurses, medical staff, and public health service providers who work with mothers and infants should apply the concept of the ELESSS program in their workplaces to play a special role for maternity services in protecting, promoting, and supporting breastfeeding.

5.6 FURTHER RESEARCH

1. Promote the ELESSS program for pregnant woman of other ages and from other areas in order to obtain more complied evidence.

2. Test the cost-effectiveness of the ELESSS program

3. Focus on the qualitative study for understanding the influential factors of exclusive and no exclusive breastfeeding in adolescent mothers and grandmothers

4. For a longer period, follow recommendations by WHO and UNICEF that mothers should breastfeed exclusively for the first six months of life of their babies and should engage in partial breastfeeding combined with an appropriate diet until the babies are aged two or beyond, to establish an understanding of the intervention effects, their sustainability, and their adherence over time.

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APPENDICES

APPENDIX A

Checklist for screening participant

No……..

Adolescent mothers

1. Thai pregnant women aged less than 20 years (count at delivery date).
2. Primiparous or first time baby.
3. Normal breast and nipples.
4. Having a good relationship with mother or mother in law.
5. Her husband had a good relationship with mother or mother in law.
6. Term pregnancy.
7. No contraindication to breastfeeding.
8. Using the service of antenatal care, delivery and well child care at Banmi and Inburi hospital.
9. Having a telephone.

Infant

1. The APGAR scores at 5^{th} minute were equal to 7 points or higher.
2. Birth weight between 2,500 - 4,000 grams.
3. No problems with sucking such as cleft lip and cleft palate and severe tongue-tie.
4. No contraindications to breastfeeding or hospitalization.

Grandmothers

1. Thai women aged 35-60 years.
2. They lived in the same house with adolescent mothers or nearby.
3. Having a disease intercept to care their children such as active tuberculosis and scabies.

APPENDIX B

The personal information questionnaire

Adolescent mothers Interviewee's code……

The following information will be obtained from an interview with the participant.

1. Age……(years, months at delivery date)
2. Parity……..
3. Education

□ Primary school □ Junior secondary school □ Senior secondary school

□ Vocational □ Bachelor □ Other……..

4. Marital status

□ Married □ Divorced □ Widowed □ Separated temporary

□ Separated permanent □ Solitary □ Other……..

5. Occupation

□ Studying □ employee □ Trader

□ Unemployed □ Other……..

6. Incomes……. (baht) □ Other……..
7. First time to visit ANC……. (week, days)
8. Mode of delivery

□ NL □ F/E □ V/E □ C/S

9. Infant birth weight……..grams.
10. Date of vaccination at 2-month…….6-month……..
11. Data for home visit

    Address…….....

    Phone number……....

Grandmothers, interviewee's code……

The following information will be obtained from an interview with the participant.

1. Age…….. years
2. The relationship with adolescent mothers

□ Mother □ Mother in law □ Other……..

3. Education

□ Illiteracy □ Primary school □ secondary school

□ Vocational □ Bachelor or higher □ Other……..

4. Occupation

□ Government/ state enterprise □ Private business

□ Trader □ Employee

□ Housewife □ Other……..

5. Experience to breastfeed exclusively infant (6 months)
   □ Ever, reason……
   □ Not ever, reason…….
6. Intention to feed your grandchildren within 6 months

□ Exclusive breastfeeding

□ Breast milk with water

□ Breast milk and formula milk

□ Breast milk and complementary food

□ Breast milk, formula milk and complementary food

□ Other……..

Breastfeeding knowledge questionnaire (for adolescent mother and grandmother)

Please indicate whether the following statements are “True” or “False” by placing “✓” in the box.

No.	Issues	True	False
1	Breast milk contains immunity to help reduce the chances of the infant becoming sick		
2	Breastfeeding helps the uterus return to its original size more quickly.		
3	Breastfeeding reduces the risk of cancers such as breast cancer and ovarian cancer.		
4	The initiation of breastfeeding should occur soon after delivery or within the first 30 minutes to one hour after birth.		
5	Yellow breast milk (colostrum) should be discarded because it is spoiled.		
6	The most important technique for breastfeeding is frequent suckling every two to three hours.		
7	Good latching on is the baby taking the nipple only into his/her mouth to suckle.		
8	The baby can receive sufficient nutrition from breast milk if the mother breastfeeds 10-15 minutes on each side.		
9	Let the infant suckle fully from one breast before switching.		
10	Exclusive breastfeeding is appropriate for infants until six months old.		
11	After breastfeeding, babies should be fed water to wash their mouth.		
12	Infants will suffer malnutrition with exclusive breastfeeding.		

No.	Issues	True	False
13	The best way to tell if babies receive enough milk is that they sleep two to three hours and have six or more wet diapers in one day.		
14	Breast milk is easier to digest than formula milk.		
15	Before infant suckling, the mother should clean her nipples with soap.		
16	If cracked nipples are not bleeding, the mother can breastfeed her infant.		
17	Applying expressed breast milk to the cracked nipples accelerates healing.		
18	Mothers who suffer from stress release less milk.		
19	If mothers are not at home, they can express breast milk and store it in the refrigerator.		
20	Breast milk that has been refrigerated can be heated in the microwave before giving it to the infant.		

Attitude towards breastfeeding questionnaire (for adolescent mother and grandmother)

Explanation: Please mark ✓ in the blank, to indicate your view to the following statements. (1= strong disagree, 2= disagree, 3= neutral, 4= agree, 5= strong agree)

No.	Issues	5	4	3	2	1
1	Breastfeeding increases mother-infant bonding.					
2	Breastfeeding saves the family money.					
3	Breastfeeding helps protect the environment.					
4	Breastfeeding is more convenient than formula feeding.					

No.	Issues	5	4	3	2	1
5	Formula feeding is a better choice for mothers who work outside the home.					
6	Small breasts do not produce sufficient milk.					
7	Mothers with flat or inverted nipples cannot breastfeed.					
8	Breastfeeding makes mothers' breasts sag.					
9	Formula-fed infants are more likely to be overfed than breastfed infants.					
10	Mothers who formula feed their infants have more time to relax than breastfeeding mothers.					
11	Breastfeeding wastes more time than formula feeding.					
12	If you feed your infant with breast milk, nobody helps you feed your baby.					
13	Private time will be limited when you choose breastfeeding.					
14	Embarrassed from performing lactation in public places.					
15	Fathers feel left out if mothers breastfeed their babies.					

Breastfeeding Practice questionnaire (Adolescent mothers)

Explanation: Please mark ✓ in the blank, to indicate your practice to the following statements. (4= always, 3= very often, 2= sometime,1= never)

No.	Issue	4	3	2	1
1	I feed my baby only breast milk.				
2	I wash my hands before feeding my baby.				
3	I can feed my baby either in a sitting up or lying back position.				
4	I prepare my position before breastfeeding by pulling the baby close to me (mothers' abdomen is close to the baby's). The baby's head is in a straight line with its body and is raised a little higher than the bottom.				
5	I hold my breast with tip of the thumb on the top outside the areola area and other finger placed under the breast.				
6	When the baby latches on, I insert the nipple into the baby's mouth as deeply as possible until its gum is on the areola and its mouth covers the whole areola.				
7	I stroke the baby's cheek if he/she doesn't suck or falls sleep.				
8	I pull the nipple from the baby's mouth by pressing the breast away from the corner of the baby's mouth or lift the baby's lip by putting a clean finger into the corner of the baby's mouth.				
9	I stimulate the baby for suckling every 2–3 hours.				
10	I allow the baby to drink from one breast until it seems empty.				

11	After feeding, I help the baby burp by holding him/her upright over my shoulder and gently patting or rubbing its back or by sitting the baby on my lap and supporting him/her with one hand in front while gently patting or rubbing its back with the other hand.				
12	I feed water to my baby after breastfeeding.				
13	I feed my baby with mashed banana or complementary food.				
14	I feed my baby with formula milk due to insufficient breast milk.				
15	When the breast is engorged, I use moist heat on the breast for a few minutes and then perform gentle breast massage and hand expression.				
16	Breast milk is stored in a refrigerator when I am not at home.				
17	Before expressing breast milk, I relax, thinking good things for my baby.				
18	I label and date my bag before storing it in the refrigerator.				
19	I breastfeed my baby 10–15 minutes on each side and alternate both sides until he/she is full.				
20	I eat nutritious food to increase my breast milk supply.				

Breastfeeding Practice questionnaire (for grandmothers**)**

Explanation: Please mark ✓ in the blank whether you "yes" or "no" with each statement.

No.	Issue	Practice	
		Yes	**No**
1	Wash hands before helping with feeding.		
2	Remind adolescent mother to wash her hands before feeding her baby.		
3	Recommend that the adolescent mother take the breastfeeding position.		
4	Recommend and help the adolescent mother to hold the infant to breastfeed.		
5	Recommend how to hold the breast.		
6	Advise the adolescent mother about latching on by inserting the nipple into the baby's mouth as deeply as possible until its gum is on the areola and its mouth covers the whole areola.		
7	Recommend that the adolescent mother starts her baby on the same breast side as last time.		
8	Recommend the adolescent mother to let her baby suck 10–15 minutes on each side and alternate both sides until full.		
9	When the baby sleeps during breastfeeding, stimulate by stroking the baby's cheek or moving the breast.		
10	Recommend the mother to pull the nipple from the baby's mouth by pressing the breast away from the corner of the baby's mouth or by lifting the baby's lip by putting her clean finger into the corner of the baby's mouth.		
11	After feeding, help the infant burp by holding the child upright over a shoulder and gently patting or rubbing its back or by sitting the baby on the lap and supporting it with		

No.	Issue	Practice	
		Yes	No
	one hand in front while gently patting or rubbing its back with the other hand; or recommend that the mother use this method.		
12	When the mother is engorged, recommend warm compression and hand expression for releasing.		
13	Recommend or give water to the infant.		
14	Recommend or give mashed banana or complementary food to the infant.		
15	Advise the mother to label and date the milk bag before storing it in the refrigerator.		
16	Show or tell the method of cup feeding.		
17	Recommend or prepare nutritious food to increase the milk supply.		
18	Give encouragement and appreciation to the adolescent mother when she breastfeeds the baby.		
19	Help with the adolescent's chores while she breastfeeds the infant.		
20	Help the adolescent take care of her baby when she wants to relax.		

Perceived social support questionnaire (for adolescent mothers)

Explanation: Please mark ✓ in the blank, to indicate your view to the following statements. (4= Agree, 3= Somewhat agree, 2= Somewhat disagree, 1= Disagree)

Issue	4	3	2	1
1. Emotional support 1.1 Grandmother cheers you up to breastfeed infant.				
1.2 Grandmother listens and solves problems caused				

Issue	4	3	2	1
by breastfeeding.				
1.3 When you are frustrated and moody, your grandmother supports and cheers you up.				
2. Appraisal support 2.1 You were praised for the breastfeeding decision by your grandmother.				
2.2 Grandmother told you that you have the ability to breastfeed.				
3. Information support 3.1 You got information about breastfeeding from hearsay from the grandmother.				
3.2 You have been guided and assisted by the grandmother when you practice breastfeeding incorrectly.				
3.3 Grandmother recommended resources to help or provided support about breastfeeding to you (for example, introducing people to consult, introducing television and radio about breastfeeding).				
4. Instrumental support 4.1 Grandmother helps you take care of your baby when you want to relax or you have business.				
4.2 Grandmother helps with your chores while you are breastfeeding the infant.				
4.3 Grandmother brought you and your baby to the hospital for an appointment or vaccination.				
4.4 Grandmother prepared necessary things for breastfeeding such as milk expressing equipment, glass, milk storage bag, and liquid cleaner for the infant.				

Pattern infant feeding questionnaire (staff)

No……

Explanation: using ask adolescent mothers "what does the infant eat in past 24 hours recall period?

Time	Breast milk	water	Juice honeydew	cereal	Mashed banana	mashed Riced	Formula milk	other
7-day								
14-day								
1-month								
2-month								
3-month								
4-month								
5-month								
6-month								

EBF	
DBF	
CF	
	NBF

APPENDIX C THE INSTRUMENT EVALUATION

The questionnaire including breastfeeding knowledge, attitude towards breastfeeding, breastfeeding practice and perceived social support were tested by 30 pairs of adolescent mothers and grandmothers in other hospital in Saraburi province who had characteristics similar to the participants in the intervention group. The Kuder-Richardson (KR-20) method was used to assess the reliability of the breastfeeding knowledge and found it to be 0.72 in adolescent mothers and grandmothers. A Cronbach's alpha coefficient of their attitude was 0.73, breastfeeding practice of adolescent mothers and grandmothers were 0.79 and perceived social support of adolescent mothers was 0.88. The detail in each item was presented in the table below.

Breastfeeding knowledge of adolescent mothers

No.	Item	Internal consistency if Item Deleted
1	Breast milk contains immunity to help reduce the chances of the infant becoming sick	.720
2	Breastfeeding helps the uterus return to its original size more quickly.	.707
3	Breastfeeding reduces the risk of cancers such as breast cancer and ovarian cancer.	.702
4	The initiation of breastfeeding should occur soon after delivery or within the first 30 minutes to one hour after birth.	.689
5	Yellow breast milk (colostrum) should be discarded because it is spoiled.	.722
6	The most important technique for breastfeeding is frequent suckling every two to three hours.	.699

No.	Item	Internal consistency if Item Deleted
7	Good latching on is the baby taking the nipple only into his/her mouth to suckle.	.677
8	The baby can receive sufficient nutrition from breast milk if the mother breastfeeds 10-15 minutes on each side.	.714
9	Let the infant suckle fully from one breast before switching.	.678
10	Exclusive breastfeeding is appropriate for infants until six months old.	.702
11	After breastfeeding, babies should be fed water to wash their mouth.	.724
12	Infants will suffer malnutrition with exclusive breastfeeding.	.701
13	The best way to tell if babies receive enough milk is that they sleep two to three hours and have six or more wet diapers in one day.	.694
14	Breast milk is easier to digest than formula milk.	.712
15	Before infant suckling, the mother should clean her nipples with soap.	.745
16	If cracked nipples are not bleeding, the mother can breastfeed her infant.	.722
17	Applying expressed breast milk to the cracked nipples accelerates healing.	.710
18	Mothers who suffer from stress release less milk.	.693
19	If mothers are not at home, they can express breast milk and store it in the refrigerator.	.703
20	Breast milk that has been refrigerated can be heated in the microwave before giving it to the infant.	.705

Internal consistency

Internal consistency	N of Items
.717	20

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Internal consistency if Item Deleted
K1	12.77	11.840	.042	.720
K2	13.20	10.717	.286	.707
K3	13.40	10.662	.330	.702
K4	13.27	10.202	.452	.689
K5	12.93	11.513	.090	.722
K6	13.27	10.478	.362	.699
K7	13.13	9.913	.563	.677
K8	12.87	11.361	.191	.714
K9	13.00	10.069	.580	.678
K10	12.97	10.792	.336	.702
K11	12.83	11.799	.016	.724
K12	13.23	10.530	.345	.701
K13	13.03	10.447	.419	.694
K14	13.03	10.999	.230	.712
K15	13.23	12.047	-.107	.745
K16	12.77	11.909	-.013	.722
K17	12.83	11.316	.252	.710
K18	13.00	10.483	.426	.693
K19	13.07	10.685	.323	.703
K20	13.10	10.714	.303	.705

Breastfeeding knowledge of grandmothers

No.	Item	Internal consistency if Item Deleted
1	Breast milk contains immunity to help reduce the chances of the infant becoming sick	.734
2	Breastfeeding helps the uterus return to its original size more quickly.	.710
3	Breastfeeding reduces the risk of cancers such as breast cancer and ovarian cancer.	.705
4	The initiation of breastfeeding should occur soon after delivery or within the first 30 minutes to one hour after birth.	.692
5	Yellow breast milk (colostrum) should be discarded because it is spoiled.	.727
6	The most important technique for breastfeeding is frequent suckling every two to three hours.	.702
7	Good latching on is the baby taking the nipple only into his/her mouth to suckle.	.682
8	The baby can receive sufficient nutrition from breast milk if the mother breastfeeds 10-15 minutes on each side.	.716
9	Let the infant suckle fully from one breast before switching.	.681
10	Exclusive breastfeeding is appropriate for infants until six months old.	.704
11	After breastfeeding, babies should be fed water to wash their mouth.	.730
12	Infants will suffer malnutrition with exclusive breastfeeding.	.704
13	The best way to tell if babies receive enough milk is	.696

No.	Item	Internal consistency if Item Deleted
	that they sleep two to three hours and have six or more wet diapers in one day.	
14	Breast milk is easier to digest than formula milk.	.714
15	Before infant suckling, the mother should clean her nipples with soap.	.748
16	If cracked nipples are not bleeding, the mother can breastfeed her infant.	.725
17	Applying expressed breast milk to the cracked nipples accelerates healing.	.712
18	Mothers who suffer from stress release less milk.	.695
19	If mothers are not at home, they can express breast milk and store it in the refrigerator.	.698
20	Breast milk that has been refrigerated can be heated in the microwave before giving it to the infant.	.700

Internal consistency

Internal consistency	N of Items
.720	20

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Internal consistency if Item Deleted
K1	12.83	12.282	-.278	.734
K2	13.27	10.754	.285	.710
K3	13.47	10.671	.338	.705
K4	13.33	10.230	.453	.692
K5	13.00	11.586	.075	.727
K6	13.33	10.506	.363	.702

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Internal consistency if Item Deleted
K7	13.20	9.959	.557	.682
K8	12.93	11.375	.199	.716
K9	13.07	10.064	.593	.681
K10	13.03	10.792	.347	.704
K11	12.90	11.955	-.042	.730
K12	13.30	10.562	.344	.704
K13	13.10	10.438	.433	.696
K14	13.10	10.990	.243	.714
K15	13.30	12.079	-.107	.748
K16	12.83	11.937	-.009	.725
K17	12.90	11.334	.258	.712
K18	13.07	10.478	.439	.695
K19	13.10	10.507	.409	.698
K20	13.13	10.533	.384	.700

Attitude towards breastfeeding of adolescent mothers

No.	**Item**	**Internal consistency if Item Deleted**
1	Breastfeeding increases mother-infant bonding.	.735
2	Breastfeeding saves the family money.	.735
3	Breastfeeding helps protect the environment.	.737
4	Breastfeeding is more convenient than formula feeding.	.725
5	Formula feeding is a better choice for mothers who work outside the home.	.720
6	Small breasts do not produce sufficient milk.	.690

No.	Item	Internal consistency if Item Deleted
7	Mothers with flat or inverted nipples cannot breastfeed.	.712
8	Breastfeeding makes mothers' breasts sag.	.696
9	Formula-fed infants are more likely to be overfed than breastfed infants.	.742
10	Mothers who formula feed their infants have more time to relax than breastfeeding mothers.	.681
11	Breastfeeding wastes more time than formula feeding.	.681
12	If you feed your infant with breast milk, nobody helps you feed your baby.	.707
13	Private time will be limited when you choose breastfeeding.	.720
14	Embarrassed from performing lactation in public places.	.730
15	Fathers feel left out if mothers breastfeed their babies.	.689

Reliability Statistics

Internal consistency	N of Items
.729	15

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
attitude	48.03	43.964	-.113	.735
attitude	48.03	43.964	-.113	.735
attitude	48.80	41.821	.097	.737

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
attitude	48.20	42.234	.250	.725
attitude	50.97	38.930	.289	.720
attitude	49.80	34.441	.514	.690
attitude	50.20	36.510	.365	.712
attitude	50.23	36.668	.496	.696
attitude	50.87	41.913	.069	.742
attitude	50.53	33.982	.578	.681
attitude	49.53	34.740	.595	.681
attitude	48.90	38.645	.416	.707
attitude	49.27	39.030	.289	.720
attitude	49.50	39.983	.201	.730
attitude	49.13	35.568	.546	.689

Attitude towards breastfeeding of grandmothers

Reliability Statistics

Internal consistency	N of Items
0.729	15

No.	**Item**	**Internal consistency if Item Deleted**
1	Breastfeeding increases mother-infant bonding.	.736
2	Breastfeeding saves the family money.	.732
3	Breastfeeding helps protect the environment.	.762
4	Breastfeeding is more convenient than formula feeding.	.749

No.	Item	Internal consistency if Item Deleted
5	Formula feeding is a better choice for mothers who work outside the home.	.717
6	Small breasts do not produce sufficient milk.	.714
7	Mothers with flat or inverted nipples cannot breastfeed.	.678
8	Breastfeeding makes mothers' breasts sag.	.680
9	Formula-fed infants are more likely to be overfed than breastfed infants.	.742
10	Mothers who formula feed their infants have more time to relax than breastfeeding mothers.	.705
11	Breastfeeding wastes more time than formula feeding.	.696
12	If you feed your infant with breast milk, nobody helps you feed your baby.	.684
13	Private time will be limited when you choose breastfeeding.	.710
14	Embarrassed from performing lactation in public places.	.709
15	Fathers feel left out if mothers breastfeed their babies.	.673

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
attitude	48.30	42.700	.034	.736
attitude	48.23	42.116	.099	.732
attitude	49.40	44.593	-.178	.762
attitude	48.57	43.564	-.087	.749
attitude	50.83	38.695	.313	.717

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
attitude	49.77	36.599	.349	.714
attitude	49.53	33.361	.599	.678
attitude	49.73	33.030	.579	.680
attitude	50.57	41.771	.054	.742
attitude	50.07	36.478	.411	.705
attitude	49.37	37.413	.553	.696
attitude	49.03	35.689	.630	.684
attitude	49.23	37.909	.376	.710
attitude	49.03	38.309	.396	.709
attitude	48.93	34.064	.674	.673

APPENDIX E THE ETHICAL CONSIDERATION

AF 01-12

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย
254 อาคารจามจุรี 1 ชั้น 2 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330
โทรศัพท์/โทรสาร: 0-2218-3202 E-mail: eccu@chula.ac.th

COA No. 109/2558

ใบรับรองโครงการวิจัย

โครงการวิจัยที่ 007.1/58 : การเรียนรู้เชิงประสบการณ์ร่วมกับการเสริมสร้างพลังอำนาจและการสนับสนุนทางสังคมของย่ายายต่อการส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างเดียวตลอดระยะเวลา 6 เดือนแรกหลังคลอดในมารดาวัยรุ่น

ผู้วิจัยหลัก : นางสาววิลาสินี บุตรศรี

หน่วยงาน : วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ได้พิจารณา โดยใช้หลัก ของ The International Conference on Harmonization – Good Clinical Practice (ICH-GCP) อนุมัติให้ดำเนินการศึกษาวิจัยเรื่องดังกล่าวได้

ลงนาม.... **ลงนาม**.....
(รองศาสตราจารย์ นายแพทย์ปรีดา ทัศนประดิษฐ) (ผู้ช่วยศาสตราจารย์ ดร.นันทรี ชัยชนะวงศาโรจน์)
ประธาน กรรมการและเลขานุการ

วันที่รับรอง : 15 พฤษภาคม 2558 **วันหมดอายุ** : 14 พฤษภาคม 2559

เอกสารที่คณะกรรมการรับรอง

1) โครงการวิจัย
2) ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัยและใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย
3) ผู้วิจัย
4) แบบตอบถาม

เลขที่โครงการวิจัย 007.1/58
วันที่รับรอง 15 พ.ค. 2558
วันหมดอายุ 14 พ.ค. 2559

เงื่อนไข

1. ข้าพเจ้ารับทราบว่าเป็นการผิดจริยธรรม หากดำเนินการเก็บข้อมูลการวิจัยก่อนได้รับการอนุมัติจากคณะกรรมการพิจารณาจริยธรรมการวิจัยฯ

2. หากใบรับรองโครงการวิจัยหมดอายุ การดำเนินการวิจัยต้องหยุด เมื่อต้องการต่ออายุต้องขออนุมัติใหม่ล่วงหน้าไม่ต่ำกว่า 1 เดือน พร้อมส่งรายงานความก้าวหน้าการวิจัย

3. ต้องดำเนินการวิจัยตามที่ระบุไว้ในโครงการวิจัยอย่างเคร่งครัด

*4. ใช้เอกสารข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย ใบยินยอมของกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย และเอกสารเชิญเข้าร่วมวิจัย (ถ้ามี) **เฉพาะที่ประทับตราคณะกรรมการเท่านั้น***

5. หากเกิดเหตุการณ์ไม่พึงประสงค์ร้ายแรงในสถานที่เก็บข้อมูลที่ขออนุมัติจากคณะกรรมการ ต้องรายงานคณะกรรมการภายใน 5 วันทำการ

6. หากมีการเปลี่ยนแปลงการดำเนินการวิจัย ให้ส่งคณะกรรมการพิจารณารับรองก่อนดำเนินการ

7. โครงการวิจัยไม่เกิน 1 ปี ส่งแบบรายงานสิ้นสุดโครงการวิจัย (AF 03-12) และบทคัดย่อผลการวิจัยภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น สำหรับโครงการวิจัยที่เป็นวิทยานิพนธ์ให้ส่งบทคัดย่อผลการวิจัย ภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น

VITA

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