Antenatal hand expression of breastmilk and mothers' self-efficacy with breastfeeding

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Junko Schettino declare that this thesis, is submitted in fulfilment of the requirements for the award of the Master of Midwifery, in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution.

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GLOSSARY AND ABBREVIATIONS

Antenatal hand expression (AHE)	The process of expressing breastmilk in antenatal period with intention of collecting colostrum.
Any breastfeeding	The infant receives some breastmilk (National Health and Medical Research Council [NHMRC] 2012b). This includes exclusive breastfeeding.
BSES-SF	Breastfeeding Self-Efficacy Scale Short-Form
Child and family health nurse	Registered nurses with further qualifications in the specialty of child and family health nursing—they possess knowledge and skills regarding infant feeding, child development, family functioning, infant mental health, prenatal mental health and health promotion.
Confidence	A global term: an individual's strong belief or expectation for a person to achieve a goal but it is not necessary to be competent or to achieve the goal (Bandura 1977a).
Exclusive breastfeeding	The infant receives only breastmilk with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines.
EBM	Expressed breastmilk
ISLHD	Illawarra Shoalhaven Local Heal District
NHMRC	National Health and Medical Research Council
Mixed feeding	The practice of giving breastmilk and any other liquid or food simultaneously
Midwife	A person with prescribed educational preparation and competence for practice who is registered by the NMBA. The NMBA has endorsed the following International Confederation of Midwives (ICM) definition of a midwife and applied it to the Australian context (Nursing and Midwifery Board Australia, 2019)
Premature labour	The onset of labour before the 37th week of pregnancy
Self-efficacy	An individual’s belief in his or her capacity to execute behaviours necessary to produce specific performance attainments

United Nations Children's Fund (UNICEF)	A leading global humanitarian and development agency that works to uphold the rights of every child
World Health Organization (WHO)	A specialised agency of the United Nations responsible for international public health

ABSTRACT

Aim

The aim of this research is to explore the maternal experiences of antenatal hand expression (AHE) and its effect on the development of maternal breastfeeding self-efficacy and breastfeeding practices in the postpartum period.

Background

AHE and breastmilk storage is potentially advantageous for all women who wish to breastfeed their infants. Until recently, only women with a high risk of developing breastfeeding problems were advised to perform AHE. Whether AHE benefits all women, including those without the high risk, needs to be researched further. Some studies indicated that AHE reduces woman's stress response to breastmilk production in the immediate postpartum period and improves breastfeeding 'confidence' or breastfeeding 'self-efficacy'. However, few studies have confirmed this.

Method

A cross-sectional web-based survey with quantitative and qualitative questions was used to collect data. The survey questions explored maternal experiences of how AHE affects maternal breastfeeding self-efficacy and breastfeeding outcomes. Participants were recruited via social media sites, including Facebook and a parenting website.

Findings

The quantitative findings demonstrated that there was no significant correlation between AHE and maternal breastfeeding self-efficacy or breastfeeding outcomes. However, women who expressed breastmilk and stored it antenatally were more likely to have

higher maternal breastfeeding self-efficacy compared with those who expressed breastmilk but did not store it antenatally. The qualitative findings highlighted that AHE *can* be a strategy to develop maternal breastfeeding self-efficacy. Of note, within the qualitative findings the women identified numerous issues regarding AHE education or support and contemporary breastfeeding education that require improvement. The issues were as follows:

- Adequate information regarding AHE was not provided during antenatal breastfeeding education programs.
- Individualised one-on-one support for women was not regularly provided.
- Midwives or other health professionals provided inconsistent or conflicting breastfeeding advice.
- The quality, level and content of contemporary breastfeeding education classes varied among hospitals.

Conclusion

Learning to express breastmilk during the antenatal period is a useful skill to help women gain confidence and competence during pregnancy. Developing this skill during the antenatal period will benefit maternal self-efficacy and her ability to breastfeed her infant. This study highlighted issues regarding AHE support and contemporary breastfeeding education and made four main recommendations to resolve them:

including AHE information in antenatal breastfeeding education as a compulsory measure:

improving individualised one-one-on support.

improving staff education regarding providing breastfeeding support.

improving the quality of and access to antenatal breastfeeding education classes.

CHAPTER 1: **INTRODUCTION TO THE RESEARCH**

1.1 **Introduction**

1.1.1 **Research Aim**

The aim of this research was to explore maternal experiences of AHE and its effect on the development of maternal breastfeeding self-efficacy.

1.2 **Background**

Over the past 15 years, there has been a renewed recognition of the value of antenatal hand expression (AHE) as a way to assist women with diabetes to prevent their newborn infants developing hypoglycaemia (Australian Breastfeeding Association [ABA] 2017; Cox 2006, 2010; Wszolek 2015). Research has identified that teaching hand expressing during pregnancy assists women gain a useful postnatal skill if women have difficulty with attachment, full breasts, blocked ducts or using a breast pump (ABA, 2017; Cox 2006) or need to feed their infant breastmilk in a bottle. These issues are commonly experienced during the early postpartum period.

This chapter includes a discussion of the following: the benefits of breastfeeding and breastmilk; maternal self-efficacy; the identified benefits of AHE; the significance of AHE as an antenatal breastfeeding self-efficacy intervention; contemporary antenatal breastfeeding education that includes the emotional and psychological aspects of breastfeeding, antenatal breastfeeding education and AHE; the significance of this research study; and the structure of this thesis.

1.2.1 **Benefits of breastmilk and breastfeeding**

Breastmilk is the perfect nutrient for an infant as breastfeeding is the biological norm for an infant. Breastmilk and breastfeeding have been identified as having numerous long-term positive outcomes for maternal and infant health (NHMRC 2012a; New South Wales Ministry of Health [NSW Health] 2015; Walker 2017; World Health Organization [WHO] 2017b). The Centers for Disease Control and Prevention (CDC) emphasised that breastfeeding is not just a personal preference but a public health issue (CDC 2018). Breastfeeding reduces the risks of some cancers and chronic metabolic syndrome (Bartick 2013; NHMRC 2012a; Rothenberg & Barrett 1998; Walker 2017; WHO 2016, 2017b), assists with a quicker and easier return to pre-conception weight (Walker 2017) and reduces the risk of postnatal depression for women (Kendall-Tackett, Cong & Hale 2011). Breastmilk is clearly identified as important for infants as it provides some protection from infection, reduces the risk of them developing neonatal jaundice, assists in stabilising their blood sugar level and boosts their immune system and helps prevent them developing type 1 diabetes, cow's milk protein allergy and asthma later in life (Heinig & Dewey 1996; Horta, de Mola & Victoria 2015; McCrory & Murray 2013; Meldrum & Simmer 2016; NHMRC 2012a; Walker 2017; WHO 2017a). Additionally, breastfeeding has significant economic benefits for Australia's health care system. The ABA (2015) reported that premature weaning from breastfeeding in Australia is estimated to cost $60–120 million annually due to a link between weaning and five childhood diseases (i.e., gastrointestinal illness, respiratory illness, otitis media, eczema and necrotising enterocolitis).

The WHO and the United Nations Children's Fund (UNICEF) launched the Baby-friendly Hospital Initiative (BFHI) in 1991 to implement practices that protect, promote

and support breastfeeding by providing a framework within which baby-friendly hospitals can operate called the 'Ten Steps to Successful Breastfeeding'. In community facilities, this is called the 'Seven-Point Plan' (Australian College of Midwives 2018; UNICEF & WHO 2018). Hospitals that have gained 'baby-friendly' accreditation provide high standards of breastfeeding education and support to both women and their infants. Of the 266 hospitals that provide maternity services in Australia, only 70 are currently 'baby-friendly' accredited (BFHI Australia 2020). This means about one-third of infants born in Australia are born in a BFHI hospital (Australian Government Department of Health [DoH] 2012).

To enhance the advantages of breastfeeding and breastmilk, the WHO (2003; 2017a) recommended that women exclusively breastfeed their infants up to when the child is six months. Breastfeeding should then be continued while providing complementary foods until the child is two years of age or older. Critically, Australia, as a high-income country, is still struggling to increase the level of prolonged breastfeeding. Statistics from the Australian National Infant Survey (ANIFS) indicated that 93% of women initiate breastfeeding (Australian Bureau of Statistics 2019) but that exclusive breastfeeding rates then rapidly decline. Demonstrably, only 3 in 10 (29%) infants are exclusively breastfed at six months, which is well below the WHO's recommendation (UNICEF & WHO 2018).

1.2.2 **Maternal self-efficacy**

In social cognitive theory (SCT), Bandura (1977b) defined self-efficacy as a person's belief in their own capabilities to produce certain levels of achievement. Self-efficacy comprises two elements: outcome expectancy (a belief regarding the likelihood of a behaviour leading to a specific outcome) and self-efficacy expectancy (confidence that

one can perform tasks at a certain level to produce the expected outcome) (Bandura 1994). People with strong self-efficacy in their capabilities set goals and commit to mastering difficult tasks instead of considering difficulty as a risk to avoid; they are purported to be able to quickly recover their sense of efficacy after failures or obstructions because they consider challenging issues conquerable through sustained efforts (Bandura 1977a, 1977b, 1994). Conversely, although those with a low sense of self-efficacy may believe that certain tasks will assist them to achieve a certain outcome, they tend to have little confidence in their own ability to achieve their goal (Bandura 1994). Therefore, they avoid difficult tasks, which they view as a personal threat (Bandura 1977a, 1977b, 1994).

Adapting this theory, maternal breastfeeding self-efficacy is defined as a woman's confidence in her own ability to breastfeed her infant (Dennis 1999), and it has been recognised as an important psychometric factor for improving breastfeeding outcomes. Bandura (1977b) claimed that developing self-efficacy comprises four antecedent factors: mastery experiences, vicarious mastery experiences, social persuasion, and physiological and affective states. A further discussion of maternal breastfeeding self-efficacy and a detailed description of the antecedent factors is provided in Chapter 3.

1.2.3 **Identified benefits of AHE**

Antenatal hand expression of breastmilk (AHE) for women with diabetes has been not only considered beneficial to avoid formula supplementation but also encouraged in an increasing number of hospitals (Cox 2006, 2010; Forster et al. 2017; Illawarra Shoalhaven Local Health District [ISLHD] 2014; Wszolek 2015). Further, AHE has been promoted in recent years as advantageous for women who are in other high-risk

groups, demonstrably, certain medical conditions (e.g., breast hypoplasia,[‡] hyperandrogenoesis[§] and multiple sclerosis), a woman's history of breastfeeding difficulties (e.g., positioning or attachment problems or insufficient breastmilk production) and breast surgery can put an infant at risk during breastfeeding or its initiation (Cox 2006; ISLHD, 2014; Oscroft 2001; Wszolek 2015). However, the evidence does not extend to well women with low-risk pregnancies such as women without gestational diabetes or history of caesarean section. More generally, Wszolek (2015) emphasised the following advantages of AHE and breastmilk: establishing lactation more quickly, having higher confidence in hand expressing prior to the baby's birth, gaining familiarity with one's breasts and feeling more confident and better prepared for breastfeeding.

Teaching hand expressing during pregnancy is considered useful if women have difficulty with attachment or using a breast pump or if they have full breasts or blocked ducts, which are common issues in the early postpartum period. Further, Oscroft (2001) noted that practising the skill of hand expressing breastmilk antenatally assists a woman to manage early feeding problems, such as her anxiety surrounding perceived insufficient breastmilk production in the early postpartum period. Additionally, breastfeeding outcomes can include maternal confidence and self-efficacy when antenatal preparation involves expressing breastmilk to build maternal confidence in the woman's ability to breastfeed (Oscroft 2001). However, although these comments were based on Oscroft's clinical experiences, no evidence was provided.

[‡] Breast hypoplasia means breasts that do not produce enough milk because of insufficient glandular tissue (IGT). Glandular tissue is the milk-making tissue in the breast. However, if a woman has IGT, it is likely that she will still be able to breastfeed her baby.

[§] Hyperandrogenoesis is a medical condition characterised by high levels of androgens in females. Symptoms may include acne, seborrhea (inflamed skin), hair loss on the scalp, increased body or facial hair and infrequent or absent menstruation.

1.2.4 **The significance of AHE as an antenatal breastfeeding self-efficacy intervention**

There is a strong correlation between antenatal breastfeeding self-efficacy intervention and maternal breastfeeding self-efficacy (Ansari et al. 2014; Mizrak, Ozerdogan & Colak 2017; Nichols et al. 2009; O'Sullivan et al. 2018; Otsuka et al. 2013). Antenatal self-efficacy intervention based on Bandura's (1977a) self-efficacy theory was conducted to examine the intervention's effect on maternal breastfeeding self-efficacy and breastfeeding outcomes (Nichols et al. 2009; Otsuka et al. 2013). These points were compared among women in the intervention group who received a workbook to complete during their pregnancy; the control group did not receive the workbook. This workbook was created by Nichols et al. (2009) and was based on Bandura's (1997a) self-efficacy theory. The workbook comprised the following: exploring women's thoughts and feelings regarding their previous performance accomplishments in various areas (i.e., mastery experience); building women's confidence by learning from others (i.e., vicarious experience); guiding women to record useful, encouraging statements and asking them to use these statements when requesting support from their support person (i.e., verbal persuasion); and exploring how to respond to stress (i.e., physiological and affective states).

The results of Nichols et al.'s (2009) study indicated that women in the intervention group increased their breastfeeding self-efficacy significantly in comparison to those in the control group and that the intervention group tended to breastfeed their infants longer and more exclusively than the control group. Further, Otsuka et al. (2013) recorded the same results when they used an alternative version of the workbook in 'baby-friendly' accredited hospitals in Japan. Antenatal breastfeeding self-efficacy

intervention enhanced maternal breastfeeding self-efficacy in the postpartum period. These results suggest that AHE has potential to improve maternal self-efficacy with breastfeeding (Forster et al. 2011).

1.2.5 **Contemporary antenatal breastfeeding education**

Many women are likely to experience breastfeeding challenges when breastfeeding their infants. Demonstrably, Binns and Scott (2002) reported that almost 4 in 5 breastfeeding women experienced breastfeeding problems during their hospital stay. Further, the results of McCann, Baydar and Williams's (2007) study revealed that 70% of women reported at least one breastfeeding issue within the first month after their infant's birth. Importantly, breastfeeding problems can adversely affect women's confidence—and their breastfeeding self-efficacy—if they consider these problems failures.

Although Bäckström, Hertfelt Wahn and Ekström (2010) reported that the women in their study requested not only more follow-up by health professionals but also more individualised support in which their concerns were listened to, the midwives in their study described themselves as encouraging and that they confirmed the women's needs. These opposing expectations and attitudes regarding breastfeeding support potentially had a significant effect on the women's development of maternal breastfeeding self-efficacy. To address this issue, Dietrich Leurer and Misskey (2015. p.6) stated:

> …based on the findings in our research, breastfeeding education should address common problems by including content such as strategies to prevent/reduce discomfort and manage milk supply, coping mechanisms for those who feel tied down, and campaigns to change societal attitudes that make women feel uncomfortable or embarrassed in public places.

Significantly, there has been no focus on written formal antenatal education about AHE found within the published research literature. However, knowing how to express breastmilk has been widely considered a vital skill that breastfeeding women should have (UNICEF & WHO 2018). Demonstrably, step 5 of the BFHI's 'Ten Steps to Successful Breastfeeding' requires health professionals to teach and encourage women to express breastmilk to maintain lactation (UNICEF & WHO 2018). UNICEF and the WHO's (2018) aim was for at least 80% of mothers of breastfed preterm and term infants to either demonstrate correctly[**] or describe how to express breastmilk. However, although UNICEF and the WHO (2018) recommended that this breastmilk expression education and support be implemented during the early postpartum period, they did not discuss the recommendation to provide AHE support.

One of the most common reasons that women cease breastfeeding is their perceived breastmilk insufficiency (Xu et al. 2007; Newby & Davies 2016). This belief may not be based solely on a perception of insufficient breastmilk production but on a lack of maternal breastfeeding self-efficacy (McCarter-Spaulding & Kearney 2001; Otsuka et al. 2008), which often causes women to view breastfeeding challenges as a threat. Moreover, women who have had difficulties during labour are not always ready to learn skills or absorb information as they need to recover emotionally and physically, which often results in sleep deprivation and transient cognitive impairment (Parratt & Fahy 2011). Another common reason that women cease breastfeeding is their attempt to reduce their stress responses and anxiety levels during the early postpartum period by starting to provide their infants with complementary formula Cox 2004). However, this often results in many women continuing to struggle to breastfeed their infants during

[**] The term 'correctly' has been used to describe optimal positioning of the infant. However, this positioning may change for each mother/infant dyad.

this period (Attrill 2002; Cox 2004; Otsuka et al. 2008; Svensson 2015). Therefore, an increased focus on using a strength-based approach in antenatal breastfeeding education and support is needed to enable women to develop breastfeeding self-efficacy (Craig & Dietsch 2010; Nichols et al. 2009; Otsuka et al. 2013). AHE is a potentially significant strategy with which to achieve this.

1.3 **Positioning of this research**

As a midwife accredited as a lactation consultant (LC) and having worked with women who have had diabetics during pregnancy, I have become aware of the importance of these women bringing expressed breastmilk (EBM) into the hospital before childbirth to use in the early hours and days postpartum. This EBM is a precautionary measure to ensure their infants have adequate amounts of breastmilk available. Further, these women seem to be more confident in and positive about their ability to breastfeed their infants. Demonstrably, women have stated, 'I am okay, I am bringing my own breastmilk to give my baby' and 'I know how to express breastmilk already if I need more'. These positive responses have encouraged me to believe that AHE improves maternal breastfeeding confidence and self-efficacy by reducing women's anxiety and stress response (i.e., physiological and affective states).

To date, no study has investigated the link between AHE and women's self-efficacy in breastfeeding; only a few studies have examined the effect of AHE and storage of breastmilk on women's *breastfeeding confidence* rather than on maternal *self-efficacy* in the postpartum period.

1.4 **Thesis structure**

In **Chapter 1,** an introduction—including a discussion of the study's significance—is provided. In the background, the benefits of breastfeeding and breastmilk and the current issues related to breastfeeding rates and durations in Australia are discussed. Additionally, the possible positive effects of AHE of breastmilk on maternal breastfeeding self-efficacy and breastfeeding outcomes are examined.

Chapter 2 presents the literature review, which explores how AHE of breastmilk affects the four antecedent factors (i.e., mastery experience, vicarious experience, social persuasion and physiological and affective states) in developing maternal breastfeeding self-efficacy and breastfeeding outcomes. This literature review describes that AHE of breastmilk, as a part of antenatal breastfeeding education, can potentially develop maternal breastfeeding self-efficacy and improve breastfeeding outcomes during the postpartum period. However, AHE can have some negative effects (i.e., reducing maternal breastfeeding confidence) if the skills of this practice cannot be achieved. Notably, there was limited literature available as this is a new area of research.

Chapter 3 provides the details of and rationale for the research design and the methodology, which was used to not only explore the effect of AHE on maternal breastfeeding self-efficacy and its influence on breastfeeding practices but also speculate maternal perceptions of contemporary breastfeeding education that included AHE. Quantitative and qualitative methods were used, and this chapter describes the various components of these methods, including the instruments used for data collection, the data collection itself and the recruitment and analysis processes. Finally, the management and ethical considerations that were undertaken for this research are presented.

Chapter 4 presents the quantitative findings of the AHE study. This chapter verifies the effect of AHE in accordance with the following findings:

1. the comparison of how AHE affects maternal breastfeeding self-efficacy in both groups (i.e., AHE versus non-AHE) using the Breastfeeding Self-Efficacy Scale Short-Form (BSES-SF)
2. the comparison of how AHE affects maternal breastfeeding self-efficacy in three groups (i.e., AHE-stored breastmilk, AHE-not stored breastmilk and non-AHE) using the Breastfeeding Self-Efficacy scale Short-Form (BSES-SF)
3. current feeding methods compared between both groups
4. the effect of AHE on exclusive breastfeeding and any breastfeeding after adjusting for demographic and clinical factors.

Chapter 5 explores women's experiences of AHE and its influence over their infant feeding practice. The survey used in the AHE study asked qualitative requests and questions, including 'Describe your antenatal experiences of hand expressing and storing breastmilk' and 'How did AHE influence your choice of infant feeding method?' The women's responses to these two questions were combined for the data analysis as they received overlapping responses. The findings explore positive and negative influences of AHE practice on maternal breastfeeding self-efficacy and women's feeding practice.

Chapter 6 explores women's perceptions of desired components of breastfeeding education and support. This chapter's findings speculate the significance and issues of contemporary breastfeeding education, including breastmilk expression and AHE.

Chapter 7 includes discussion of and recommendations for AHE and complementary breastfeeding education on maternal breastfeeding self-efficacy; the information in this

section was derived from the quantitative and the qualitative findings in the study. Finally, the research limitations of this study are acknowledged, and a conclusion is presented.

CHAPTER 2: **AN INTEGRATIVE LITERATURE REVIEW**

2.1 **Introduction**

The aim of this integrative literature review was to explore, how AHE affects maternal breastfeeding self-efficacy during the postpartum period? Further, this review will summarise the limited number of studies on AHE and developing self-efficacy. Overall, participating in AHE can potentially increase a woman's feelings of self-efficacy as she develops competence and confidence in this new skill.

Until the 1970s, AHE of breastmilk was regularly taught to all women as part of antenatal education to prevent nipple trauma and breast engorgement (Chapman, Pincombe & Harris 2013; Cox, 2006; Walker 2017). By the 1990s, this practice had disappeared due to alternative practices being promoted, including not only unrestricted skin-to-skin contact with the infant immediately after birth and infant 'rooming-in' but also positioning and attaching the infant to decrease nipple and breast problems (Blair et al. 2003; Mohrbacher & Stock 2003; Walker 2017). However, there has been a resurgence of women using AHE if they develop diabetes during pregnancy, as this is preferable to formula supplementation (Chapman, Pincombe & Harris 2013; Forster et al. 2017; Walker 2017). In some hospitals, women who have a history of breast surgery or who have previously experienced difficulty with breastfeeding are also encouraged to express and store breastmilk prior to birth (Cox 2006; ISLHD 2014; Wszolek 2015).

Notably, AHE has the potential to be advantageous for all women who wish to breastfeed their infants as well as for those in high-risk groups (ABA 2017; Cox 2006, 2010; Wszolek 2015). In particular, Wszolek (2015) listed the following advantages of AHE: establishing lactation more quickly, increasing hand expressing confidence prior

to birth, gaining familiarity with one's breasts, increasing confidence and being better prepared for breastfeeding. Currently, step 5 of UNICEF and the WHO's (2018) BFHI's 'Ten Steps to Successful Breastfeeding' expects health professionals to teach and encourage women to express breastmilk to maintain lactation. The aim is for at least 80% of women who breastfeed their preterm and term infants to demonstrate correctly or describe how to express breastmilk (UNICEF & WHO 2018). However, UNICEF and the WHO recommended that this education and support be implemented during the early postpartum period, rather than during pregnancy.

Self-efficacy is defined as a person's belief in their capability to produce a certain level of achievement (Bandura 1977b) and is influenced by four antecedent factors (Bandura 1994). First, 'mastery experience' is the most significant factor in creating a strong sense of self-efficacy. For example, an infant who is correctly positioned at and attached to the breast can increase a mother's breastfeeding self-efficacy. Second, 'vicarious experience' appropriates others' accomplishments and increases the observer's motivation and beliefs—peer support groups can contribute positively to women's breastfeeding ability. Third, 'social persuasion' requires family members, friends and health professionals to offer appropriate advice and encouragement. The fourth, these four factors will be discussed further in Chapter 3.

2.2 **Method**

An integrative review was selected due to the limitations in the available literature. This method is effective in reviewing new topics, and it enables the inclusion of a range of resources (Torraco 2011; Whittemore & Knaft 2005). The development of the review's aim was guided by the Population, Intervention, Comparison, Outcome, Timeframe

(PICOT) approach, to provide a systematic way of identifying the issue's components (see Table 2.1; Stillwell et al. 2010).

Table 2.1: PICOT for integrative review

Population	Women who had used AHE
Intervention	AHE
Comparison	Women who used AHE and women who did not use AHE
Outcome	Breastfeeding self-efficacy or decreased self-efficacy Breastfeeding duration
Timeframe	From pregnancy to baby aged three months

Note. AHE = antenatal hand expression.

The question guiding this integrative literature review was: how does AHE affect maternal breastfeeding self-efficacy during the postpartum period?

A structured search was performed, followed by a hand search of references. This review used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Ottawa Hospital Research Institute & University of Oxford 2016). The PRISMA guidelines provided a systematic framework with which to record the search for suitable literature (see Figure 2.1). The aim of this integrative literature review was to explore, how AHE affects maternal breastfeeding self-efficacy during the postpartum period.

2.3 **Search strategy**

The search was initially limited to peer-reviewed journal articles in English that were published between 2007 and 2017; however, an additional literature search was conducted due to data being updated in 2020. This produced an additional three articles that had been published in 2020. A limited period of publication was applied to the

search as AHE has only recently been reintroduced as clinical practice, making the topic a new area of research.

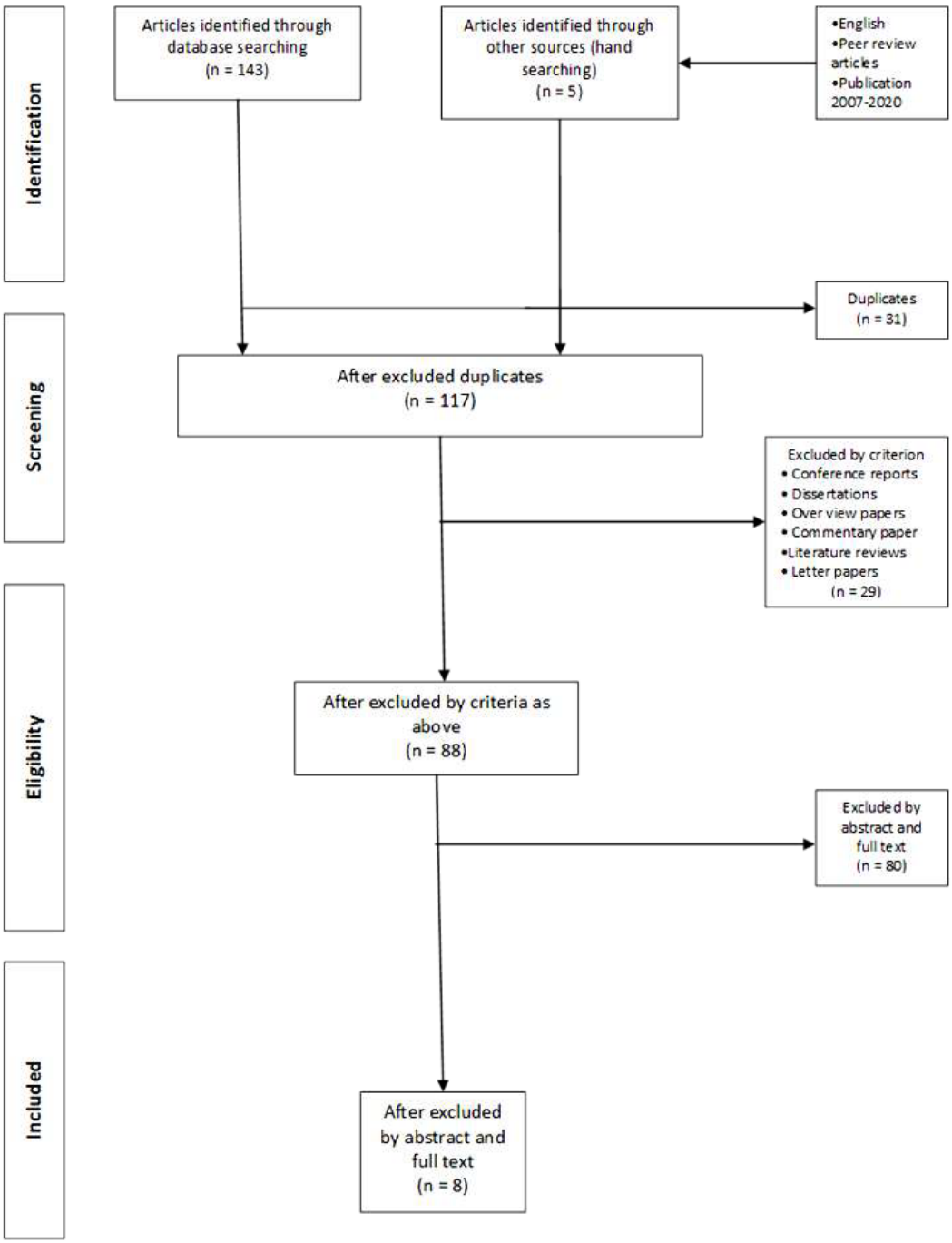

Figure 2.1: Search outcomes using PRISMA guidelines

Included articles were from peer-reviewed journals related to AHE and the effect on maternal breastfeeding self-efficacy. The databases included CINAHL (EBSCO), Cochrane Library, EMBASE (Ovid), MEDLINE (Ovid), Maternity and Infant Care (Ovid) and ProQuest (Health & Medicine; see Table 2.2 and Figure 2.1). My two supervisors assisted in reviewing the articles and an agreement was reached.

Table 2.2: The database search strategy and results

Source	Search terms /Strategy	Numbers of articles
CINAHL (EBSCO)	KW) "antenatal*" OR (KW) "prenatal" OR (KW) "peripartum period" OR (KW/MH) "pregnancy third trimester"/"Pregnancy Trimester, Third" **AND** (MH/KW) "Milk Expression"/"express*" OR (MH/KW) " Milk Human" /"milk human" OR (MH/KW) "Milk Expression"/"breast milk expression" **AND** (MH/KW) "Self-Efficacy"/" self-efficacy' OR (KW) "breastfeeding confidence" OR (KW) "breastfeeding outcomes"	10
Cochrane library (Wiley)	(All Text) Antenatal hand expression of breast milk	8
EMBASE (Ovid)	KW) antenatal* OR (KW) prenatal OR (KW/SH) peripartum period OR (KW/SH) pregnancy third trimester **AND** (KW) express* OR (KW/SH) colostrum OR (KW/SH) Milk Human OR (KW/SH) breast milk expression **AND** (KW/SH) self-efficacy OR (KW) breastfeeding confidence OR (KW) OR (KW) breastfeeding outcomes	23
MEDLINE (Ovid)		14
Maternity and Infant Care (Ovid)	(KW) antenatal* OR (KW) prenatal OR (KW) peripartum period OR (KW) pregnancy third trimester **AND** (KW) express* OR (KW) colostrum OR (KW) Milk Human OR (KW) breast milk expression **AND** (KW) self-efficacy or (KW) OR (KW) breastfeeding confidence OR (KW) OR (KW) breastfeeding outcomes	7
ProQuest (Health & Medicine)	ab(antenatal OR prenatal OR peripartum period) **AND** ab (expression OR expressing OR breast milk expression OR colostrum OR milk human) **AND** anywhere (self-efficacy OR breastfeeding confidence OR breastfeeding outcomes)	81
Total		143

Note. KW = keyword; MH = mesh heading; SH = subject heading; ab = abstract.

A total of 148 articles were identified (this included a hand search of the literature; see Figure 2.1). Articles were excluded if they were duplicates, overviews, commentaries, letter papers, dissertations, conference reports or literature reviews. Further exclusion and inclusion criteria were applied to 88 articles by abstract and full-text screening. For example, articles were excluded if they referred to AHE but did not include one of the

four antecedent factors of self-efficacy. Then, a critical appraisal and a quality assessment were performed on the articles using the Critical Appraisal and Skills Programme (CASP) tool (CASP 2017) (an example of CASP scoring is provided: see appendix D). Qualitative, Randomised Control Trials (RCTs) and cohort studies were examined based not only on whether they had a clear aim statement but also on their findings, ethical considerations, methodology quality, context, sample size, data analysis and study.

First, articles were reviewed to identify the outcome of AHE and provide a context within which to understand maternal breastfeeding self-efficacy. The articles were then examined using the four self-efficacy antecedent factors to assist in understanding the effect on maternal breastfeeding self-efficacy. The inclusion criteria required each article to include: AHE; breastfeeding outcomes; and a direct link to AHE, including at least one example of one of the four self-efficacy antecedent factors. Finally, eight articles were reviewed and summarised (see Table 2.3). Of note, with only eight articles being fitting the criteria, this is a limitation of this literature review.

The studies' findings regarding the third theme were categorised into the four self-efficacy antecedent factors (see Table 2.4) using the Template Analysis approach (see Chapter 3; King 2012). A particular style of thematic analysis, Template Analysis is a flexible technique that has specified procedures when using an a priori template to code the data, and hierarchically organising codes with groups of similar codes (subthemes) clustered together produces main themes (Brooks et al. 2015).

Table 2.3: Studies on AHE and breastfeeding outcomes

Authors & Country	Sample Size	Study Design	Interventions	Findings
Brisbane & Giglia (2015) Australia	12 women	Qualitative	In-depth telephone interviews were conducted with women who expressed and stored breastmilk from 37 weeks of gestations.	Several women in the study reported that AHE of breastmilk allowed them to become both competent and familiar with breastmilk expression, which was shown to lead to positive breastfeeding experiences. However, a few women noted that AHE was painful and challenging, and they were embarrassed to perform AHE in the presence of a midwife.
Chapman et al. (2013) Australia	347 midwives (IBCLC)	Qualitative & quantitative	A cross-sectional internet survey was conducted to IBCLC to examine the teaching practices surrounding AHE. The views of AHE's potential benefits and risks were explored.	Potential benefits of AHE included avoiding using formula and increasing self-efficacy in breastfeeding. Potential risks of AHE included uterine contractions, reduced self-efficacy regarding the ability to breastfeed, overly zealous expression of breastmilk, negative family reactions and a lack of professional support. Further research is required about how IBCLC midwives can safely provide support for mothers when they are learning AHE skills.
Demirci et al. (2019) US	19	Qualitative method in RCT	Women were shown a video modelling AHE and received written information regarding and hands-on assistance with AHE at 37 weeks of gestations. Then, weekly follow-ups with participants were conducted by the same LC. Participants were also encouraged to undertake AHE twice daily at home until birth. A semi-structured interview regarding their experience of AHE was conducted at 1–2 weeks postpartum.	Most women successfully expressed some milk in the antenatal period. The practice of AHE increased women's confidence in their breastfeeding capability and with expressing breastmilk in the event of postpartum breastfeeding difficulties. However, women reported a few problems, such as hand fatigue, breast soreness, awkwardness, that AHE was time consuming and that they were embarrassed having their partner present.

Authors & Country	Sample Size	Study Design	Interventions	Findings
Forster et al. (2011) Australia	143 women	Pilot study	Women with diabetes in the intervention group (n = 43) expressed and stored breastmilk from 36 weeks of gestations until birth. Women in the audit group (n = 100) did not express antenatally. Women were asked for comments in their telephone interview at six weeks postpartum and in the expressing diaries.	Infants in the intervention group were more likely to be admitted to SCBU (30.2%, n = 13/43) than those in the control group (16.9%, n = 15/89). Infants in the intervention group were less likely to receive formula in the first 24 hours postpartum (40.1%, n = 17/42) than those in the control group (56.1%, n = 46/82). The intervention was received positively by the majority of women; confidence and preparedness for breastfeeding increased and positive reactions included being happy to be doing something for the infant, to have a supply of colostrum and to be learning how to express. Negative reflections included: anxiety about not getting enough colostrum, that AHE was time consuming, that they experienced discomfort or pain while expressing and that they feared premature labour.
Fair et al. (2018) UK	688	Qualitative	A cross-sectional online survey was conducted to explore women's knowledge, practice and opinion of AHE. Inclusion criteria for this study were mothers or fathers currently expecting a baby or with a child under one.	More than half the participants had heard of AHE and considered AHE an acceptable practice. Positive opinions of AHE increased in the group with higher a BMI. Participants who viewed AHE positively felt it was a good idea, that it was beneficial for mothers or babies who had a medical problem and referred to AHE as positive preparation for successful breastfeeding. This included an increase in confidence with the expressing technique and establishing a milk supply. Participants who viewed AHE negatively reported concerns that it would be harmful, stressful and painful to perform and induce preterm labour.

Authors & Country	Sample Size	Study Design	Interventions	Findings
Casey, Banks et al. (2019) Australia	6	Qualitative	Women who had diabetes in previous pregnancies and who were advised to collect and store breastmilk during pregnancy were recruited. Face-to-face semi-structured interviews were conducted to explore women's experiences and perceptions of collecting and storing breastmilk during pregnancy.	Women with diabetes in pregnancy experienced guilt and stress regarding their babies' risk of complication. They tried to provide the best for their babies by collecting breastmilk, although it led to emotional distress. The women who were able to collect breastmilk in the antenatal period considered themselves more physically and psychologically prepared for postnatal breastfeeding. The women sought to become more educated about collecting colostrum antenatally by engaging in social media groups, watching YouTube videos and actively receiving midwives' support. Many participants feared having an insufficient milk supply. For some, difficulties with collecting colostrum made them uneasy regarding whether they would successfully breastfeed. One major finding was participants' eagerness for the availability of milk banks not only as a strategy to reduce wastage of unused colostrum but also as an outlet of altruism to support other mothers with an insufficient supply.
Lamba, Chopra & Negi (2016) India	200 women	Prospective cohort	Women in the intervention group (n = 100) expressed breastmilk at least once daily after 37 weeks of gestations until birth. Women in the control group (n = 100) did not express.	Women in the intervention group significantly improved the establishment of full lactation in six hours after initiation of breastfeeding than the control group., 89% (n = 89) versus 72% (n = 72), $p < 0,05$. Maternal perception of satisfactory lactation was higher in the intervention group than in the control group and previous successful breastfeeding experience influenced current breastfeeding practice positively.

Authors & Country	Sample Size	Study Design	Interventions	Findings
Soltani & Scott (2012) UK	94 women	Retrospective cohort	Women with diabetes in pregnancy who gave birth during 2001–03 were recruited. Information on AHE and birth outcomes were collected via questionnaires and maternity records.	Infants in the intervention group were more likely to be admitted to SCBU (33%, n = 5/15) than those in the control group (12%, n = 8/66), and there was a lower gestation age at birth in the intervention group (37.1 weeks) than in the control group (38.2 weeks). The breastfeeding initiation rate was 100% (n = 15/15) in the intervention group and 86% (n = 60/70) in the control group. The intervention group experienced less instances of cracked nipples and mastitis postnatally than the control group, and the intervention group experienced less breast problems postpartum in general than the control group.

Note. AHE = antenatal hand expression; IBCLC = International Board Certified Lactation Consultant; US = United States; LC = lactation consultant; SCBU = Special Care Baby Unit; UK = United Kingdom; BMI = Body Mass Index.

Table 2.4: Antecedent factors to develop maternal breastfeeding self-efficacy

	Antecedent Factors			
Authors	**Mastery Experience**	**Vicarious Experience**	**Social Persuasion**	**Physiological and Affective States**
Brisbane & Giglia (2015)	AHE increased both maternal confidence and competence with breastfeeding.	Mothers identified that watching a DVD of breastfeeding/AHE was a positive experience.	Mothers identified that watching a DVD of breastfeeding/AHE was a positive experience.	Knowing how to perform AHE reduced participants' stress response postnatally.
Casey, Banks et al. (2018)	The women who were able to collect breastmilk in the antenatal period considered themselves more physically and psychologically prepared for breastfeeding postnatally.	The women sought to become more educated about antenatal breast expression by engaging with social media groups and watching YouTube videos.	The women sought to become more competent in antenatal breast expression by seeking written material from their midwives and lactation consultants.	Challenges with antenatal breast expression motivated the women to develop physio-psychological strength to gain resilience to control their frustration associated with antenatal breast expression.
Chapman et al. (2013)	Many IBCLC midwives considered that becoming familiar with one's breasts and mastering the AHE technique antenatally improved maternal confidence and empowered participants regarding breastfeeding.	Many IBCLC midwives considered that learning breast anatomy and AHE skills increased mothers' breastfeeding self-efficacy.		IBCLC midwives considered that AHE was beneficial in reducing breastfeeding problems and enhancing mother–infant bonding.
Demirci et al. (2019)	Practice of AHE increased confidence in breastfeeding capability and in having EBM in the event of postpartum breastfeeding difficulties.			

	Antecedent Factors			
Authors	**Mastery Experience**	**Vicarious Experience**	**Social Persuasion**	**Physiological and Affective States**
Lamba, Chopra & Negi (2016)	Previous successful breastfeeding experience increased participants' confidence with their current breastfeeding practice.			
Fair et al. (2018)	Participants who thought that AHE was a good idea felt it would be beneficial for a mother or baby with a medical problem. They also referred to AHE as positive preparation for successful breastfeeding, citing their increased confidence with the expressing technique and establishing a milk supply.			
Forster et al. (2011)	Mastering AHE increased mothers' confidence with breastfeeding.			
Soltani & Scott (2012)	AHE may increase mothers' confidence with breastfeeding at birth.			AHE reduced breast problems such as cracked nipples and mastitis in the postnatal period.

Note. AHE = antenatal hand expression; IBCLC = International Board Certified Lactation Consultant; EBM = expressed breastmilk.

2.4 **Findings**

Eight studies were identified that reported on AHE and breastfeeding outcomes (see Table 2.3). Four studies were from Australia (Brisbane & Giglia 2015; Casey, Banks et al. 2019; Chapman et al. 2013; Forster et al. 2011), one study was from India (Lamba, Chopra & Negi 2016), two studies were from the United Kingdom (UK; Fair et al. 2018; Soltani & Scott 2012), and one study was from the United States of America (Demirci et al. 2019).

Three themes were identified, as follows:

1. the risks for women and infants associated with AHE
2. the relationship between AHE and postpartum breastfeeding rates
3. the relationship between AHE and maternal breastfeeding self-efficacy.

2.4.1 **The risks for women and infants associated with AHE**

Three studies identified the level of participants' risk as high-risk (Brisbane & Giglia 2015; Forster et al. 2011; Soltani & Scott 2012), three studies identified the level of participants' risk as low (Demirci et al. 2019; Fair et al. 2018; Lamba, Chopra & Negi 2016) and two studies identified the level of participants' risk as no-risk (Chapman et al. 2013; Casey, Banks et al. 2019).

Two of the reviewed studies identified the risks for women and infants regarding AHE. A retrospective cohort study on diabetes and AHE identified a higher percentage of Special Care Baby Unit admissions in the intervention group (33%, n = 5/15) than in the control group (12 %, n = 8/66, p = 0.06); there was also a lower gestation age at birth in the intervention group (37.1 weeks) than in the control group (38.2 weeks, p = 0.06;

Soltani & Scott 2012). Additionally, an AHE pilot study recruited women with diabetes in pregnancy who were planning to breastfeed, and the 43 women in the intervention group were encouraged to hand express and store breastmilk twice daily from 36 weeks gestation (Forster et al. 2011). The results demonstrated that the infants of mothers who expressed breastmilk antenatally were more likely to be admitted to the Special Care Nursery (30.2%, n = 13/43) than those whose mothers did not express (16.9%, n = 15/89; RR = 1.79; 95% [CI = 0.94–3.33]). Although infants in the intervention group had a lower gestation age, all infants in both groups were born at or after 37 weeks. The results of either study did not show statistical differences between the intervention group and the control group.

2.4.2 **The relationship between AHE and postpartum breastfeeding rates**

Two studies identified that AHE might increase breastfeeding rates (Forster et al. 2011; Soltani & Scott 2012). In Soltani and Scotts' (2012) study, women with diabetes during pregnancy who expressed breastmilk were more likely to breastfeed their infants at birth than those who did not express. Alternatively, Forster et al.'s (2011) study identified an increased incidence of infants of mothers who expressed antenatally receiving breastmilk exclusively in the first 24 hours after birth and during their hospital stay. These two studies did not show statistical differences between the intervention and control groups (Forster et al. 2011; Soltani & Scott 2012). To obtain significant results, further studies using larger sample sizes are needed (see Table 2.5).

A prospective study demonstrated that women in the intervention group who hand expressed after 37 weeks of gestations had established full lactation within six hours after initiating breastfeeding (Lamba, Chopra & Negi 2016). The researchers in this study concluded that the results were significant; however, this is questionable as the

study's definition of establishing full lactation was not explained and therefore unclear. It was noted that full lactation was achieved within six hours of birth, in most instances this is physiologically impossible. The onset of copious milk production to occur usually takes up between 32 and 96 hours (Walker 2017).

Table 2.5: Breastfeeding rates in mothers who do and do not perform AHE

Authors	Breastfeeding rates in the postpartum period	AHE	Control	RR, CI, P-value
Forster et al. (2011)	Only received breastmilk in 24 hours postpartum	59.5% (25/42)	43.9% (36/82)	RR 1.36; 95% CI 0.96 - 1.92
	Received any breastmilk in 24 hours postpartum	97.6% (40/41)	89.0% (73/83)	
	Only received breastmilk at six weeks postpartum	66.7% (26/39)	n/a	
	Received any breastmilk at six weeks postpartum	89.7% (35/39)	n/a	
	Only received breastmilk at 12 weeks postpartum	52.8% (19/36)	n/a	
	Received any breastmilk at 12 weeks postpartum	75.0% (27/36)	n/a	
Soltani and Scott (2012)	Breast feed at birth	100% (15/15)	86.0% (60/70)	P = 0.19

Note. n = sample size; RR = relative risk.

2.4.3 **The relationship between AHE and maternal breastfeeding self-efficacy**

Of the eight identified articles, only three directly examined the relationship between AHE and maternal confidence or self-efficacy with breastfeeding (Casey, Mogg et al. 2019; Demirci et al. 2019; Fair et al. 2018). The other five did not directly refer to self-efficacy, although the studies' outcomes could have been directly linked to the four self-efficacy antecedent factors (see Table 2.4; Brisbane & Giglia 2015; Chapman et al. 2013; Forster et al. 2011; Lamba, Chopra & Negi 2016; Soltani & Scott 2012).

A qualitative study that investigated the experiences and breastfeeding outcomes of 12 women who expressed antenatally and stored breastmilk identified this as 'developing mastery', which lead to positive breastfeeding experiences (Brisbane & Giglia 2015). The women considered watching a DVD of breastfeeding/AHE a positive experience (vicarious experience and social persuasion), and AHE allowed the women to develop confidence and competence (mastery experience) (Brisbane & Giglia 2015). Additionally, knowing how to hand express reduced their stress levels in the postpartum period (physiological and affective states) (Brisbane & Giglia 2015). However, a few women noted that the practice of AHE was challenging and they were embarrassed when they performed AHE in the presence of a midwife (Brisbane & Giglia 2015) .

A cross-sectional internet survey by Chapman et al. (2013) examined the teaching practices surrounding AHE of Australian International Board Certified Lactation Consultant (IBCLC) midwives. This survey identified that 93% (n = 322/347) of IBCLC midwives who responded to the survey had heard of AHE (Chapman et al. 2013). Respondents who were aware of the resurgence in teaching AHE (69.9%, n = 225/322) were asked to describe the possible benefits of this (Chapman et al. 2013). Responses included: decreased formula feeding; increased maternal self-efficacy from learning breast anatomy and AHE skills (mastery experience); reduced breastfeeding problems in the postpartum period (physiological and affective states); and enhanced mother–infant bonding (Chapman et al. 2013). Conversely, the IBCLC midwives who responded reported that the potential risks of AHE were related to psychological effects, including negative family reactions, a lack of professional support and that mothers could be overly zealous (Chapman et al. 2013). Chapman et al. (2013) concluded that IBCLC midwives experienced a dilemma between AHE's potential benefits and risks.

Further research is required to explore how IBCLC midwives can safely support women when they are learning AHE skills.

In another study, a qualitative method in a pilot RCT was used to explore the effect of AHE (Demirci et al. 2019). Semi-structured interviews regarding AHE were conducted with 19 women at 1–2 weeks postpartum (Demirci et al. 2019). Although practising AHE increased the women's confidence in their ability to breastfeed and express breastmilk in the event of postpartum breastfeeding difficulties (mastery experience), some women reported a few problems with AHE, including hand fatigue, breast soreness, awkwardness (physiological affective states), that it was time consuming and that they were embarrassed to have their partner present during AHE (Demirci et al. 2019). The women identified a need to be educated regarding safe breastmilk storage and that staff needed to provide adequate support and information to the women in hospital (Demirci et al. 2019).

The majority of women in the intervention group of Forster et al. (2011) provided positive regarding AHE and stated that they would express and store breastmilk antenatally again if necessary (mastery experience and social persuasion). The women in the intervention group reported that the benefits of AHE included less need for formula feeding and higher breastfeeding confidence (mastery experience) and that they became competent in expressing and were happy to have a breastmilk supply available for their infant (mastery experience) (Forster et al. 2011). Conversely, negative study outcomes included anxiety regarding not producing enough breastmilk, that they felt discomfort and pain (physiological and affective states) and that AHE was time consuming (Forster et al. 2011).

A cross-sectional online survey conducted by Fair et al. (2018) explored women's knowledge, practice and opinion of AHE. This survey's findings demonstrated that more than half of the participants had heard of AHE and that the practice was considered acceptable, especially with participants who had high BMI's (Fair et al. 2018). Women who viewed AHE positively believed that it would benefit women or babies with medical issues; they also considered AHE a positive preparation for successful breastfeeding that increased confidence with the expressing technique (mastery experience) and establishing milk supply (Fair et al. 2018). Conversely, women who viewed AHE negatively were concerned that it would induce preterm labour and be stressful and painful to perform (Fair et al. 2018).

Casey, Mogg et al. (2019) conducted face-to-face, semi-structured interviews to explore women's experiences and perception of collecting and storing breastmilk in pregnancy. Women with diabetes in pregnancy experienced feelings of guilt and stress regarding their infants' risk of complication so much that even practising AHE overwhelmed or distressed them (Casey, Mogg et al. 2019). This pressure also motivated women to develop personal strategies to regain control when diabetes complicated their pregnancies, including adjusting to their frustrations associated with expressing by developing maternal physio-psychological strength (Casey, Mogg et al. 2019). Engaging in women's groups on social media, watching YouTube videos and actively receiving their midwives' support were believed to be supportive strategies for women learning how to perform AHE (Casey, Mogg et al. 2019). Although many participants were afraid of having an insufficient milk supply, for some participants, difficulties with collecting colostrum led them to question if they would breastfeed successfully (Casey, Mogg et al. 2019). One major finding that emerged in this study was participants' eagerness for the availability of milk banks not only as a strategy to reduce wasting

unused colostrum but also as an outlet of altruism to support other women with an insufficient supply (Casey, Mogg et al. 2019).

Notably, Lamba, Chopra and Negi (2016) stated that previous successful breastfeeding experiences increase maternal confidence in and knowledge of breastfeeding (mastery experience). However, the authors did not provide evidence to support this conclusion.

In a study by Soltani and Scott (2012), they speculated that AHE provided women with the confidence to breastfeed their infants at birth (mastery experience). Importantly, they observed that women in the intervention group experienced less cracked nipples and mastitis during the postpartum period (Soltani & Scott 2012). Having had a positive breastfeeding experience and a lack of breast problems in the postpartum period were considered to affect maternal breastfeeding self-efficacy positively (physiological and affective states) (Soltani & Scott 2012).

2.5 **Discussion**

The question used for this integrative review was to explore, how AHE effects maternal breastfeeding self-efficacy during the postpartum period? Five of the eight identified articles directly alluded to how AHE affected maternal breastfeeding self-efficacy. Although the other three (Forster et al. 2011; Lamba, Chopra & Negi 2016; Soltani & Scott 2012) did not explicitly discuss this, they did contain examples of at least one of the antecedent factors for self-efficacy. Additionally, some correlations between the three main themes arose: health professionals and women considered AHE an acceptable practice, and the women's qualitative responses demonstrated that AHE increased their confidence with breastfeeding in the postpartum period. However, the significance of the relationship between the three themes and AHE was inconclusive.

Notably, there were no quantitative studies that directly examined how AHE affected maternal breastfeeding self-efficacy. However, the studies' overall outcomes were able to be connected to the four self-efficacy antecedent factors to establish a relationship between maternal breastfeeding self-efficacy and AHE (see Table 2.4). Further, researchers have recognised a strong correlation between antenatal breastfeeding support based on self-efficacy theory and maternal breastfeeding self-efficacy (Ansari et al. 2014; Mizrak, Ozerdogan & Colak 2017; Nichols et al. 2009; O'Sullivan et al. 2018; Otsuka et al. 2013). Demonstrably, all eight articles reviewed in this study identified that learning how to hand express breastmilk antenatally increased women's confidence with breastfeeding. Therefore, as an antenatal breastfeeding intervention, AHE can possibly be a factor in developing maternal breastfeeding self-efficacy.

In particular, Forster et al.'s (2011) and Soltani and Scott's (2012) studies demonstrated that AHE might affect breastfeeding rates positively in the early postpartum period. However, these results did not show statistical differences between their intervention groups and control groups. To obtain significant results, a further study using a larger sample size is needed. Importantly, numerous other studies have recognised that antenatal interventions and support improve breastfeeding rates and durations (Hoddinott, Lee & Pill 2006; Rosen et al. 2008; Wilhelm et al. 2006). Considering this, AHE—when used as an antenatal support—can potentially improve breastfeeding rates and durations.

Contrary to AHE's reported positive aspects, negative effects—such as restricting the development of maternal breastfeeding self-efficacy in the postpartum period—may occur. Notably, women reported that AHE was embarrassing, awkward, painful and challenging (Brisbane & Giglia 2015; Demirci et al. 2019; Fair et al. 2018; Forster et al.

2011). These challenges motivated some women to develop not only physio-psychological strength and resilience to control their frustrations regarding AHE but also maternal confidence or self-efficacy (Casey, Mogg et al. 2019). However, these negative physiological and affective states led to many women experiencing diminished development of maternal breastfeeding confidence or self-efficacy. Further, IBCLC midwives also reported that the potential risks of AHE included reducing maternal breastfeeding self-efficacy due to negative family reactions, being overly zealous in expressing and lacking professional support to express breastmilk effectively (Chapman et al. 2013). To reduce these potential risks, having health professionals provide AHE skills education and family members provide psychosocial support can be vital to developing maternal breastfeeding self-efficacy.

Additionally, the findings of Forster et al.'s (2011) pilot study demonstrated that infants of mothers who expressed before birth were admitted to the SCBU more frequently than those whose mothers did not express; further, the former had a lower gestation age at birth than the latter (Forster et al. 2011). These findings were supported by Soltani and Scott (2012), whose study reached a similar conclusion. Notably, the sample size of Forster et al.'s (2011) and Soltani and Scott's (2012) studies were small, and the differences were not statistically significant.

Notably, the eight reviewed studies do not contain enough evidence to demonstrate conclusively that there are risks resulting from AHE. The most recent non-blinded RCT conducted by Forster et al. (2017) demonstrated that performing AHE from 36 weeks of gestations reportedly caused no harm to the mothers or their infants, which led the researchers to support the use of AHE. Further, Chapman, Pincombe and Harris (2013)

and Cox (2010) highlighted that no evidence of a correlation between breastfeeding in pregnancy and premature labour existed.

These conclusions emphasised the need to support and provide information to women during pregnancy to allow them to decide whether to express from 36 weeks of gestations and/or to breastfeed after birth (Cox, 2006, 2010; Forster et al. 2017; Wszolek 2015).

2.6 **Limitations**

This literature review's limitation is the combination of search terms and keywords that may have resulted in significant articles being overlooked. The author tried to reduce the effect of this limitation by not only utilising several terms and keywords in combination to retrieve items that matched the topic's main concepts but also using a wide range of electronic databases. However, the articles identified for this review were still limited, revealing gaps in the research literature. This lack of information is unsurprising as this is a new area of research and has been reintroduced as a clinical practice only recently.

Of significance, there is an absence of research focused on AHE education within the published literature. While this is not a limitation of this current literature review it signals a need for future research into AHE education.

2.7 **Summary**

To date, we have not found a quantitative study that explored how AHE affected maternal breastfeeding self-efficacy. The women's qualitative responses within the eight identified articles highlighted that AHE, as a part of an antenatal breastfeeding intervention and support, has the potential to develop maternal breastfeeding self-

efficacy and enhance breastfeeding practice. Nevertheless, AHE could also has a potential negative effect on the development of maternal breastfeeding self-efficacy in the postpartum period. Further studies are needed to confirm this evidence.

CHAPTER 3: **RESEARCH METHODOLOGY**

3.1 **Introduction**

This chapter will discuss the research methodology and study design that were used to explore not only AHE's effect on maternal breastfeeding self-efficacy on breastfeeding practices but also maternal perceptions of contemporary breastfeeding education. A survey-based quantitative and qualitative survey was used to collect the data for this research project. Analysis of the quantitative data used descriptive statistics, and a Template Analysis approach was used to analyse the participants' qualitative responses (King 2012). This chapter also discusses this study's various components, as follows: its aim, hypothesis and objective; the instruments used to collect data; the recruitment process; the data collection and analysis process; and the study's qualitative component. Finally, details of data management and the ethical considerations that were undertaken for this research are provided.

3.2 **Overall aim**

The aim of this study was to explore maternal experiences of AHE of breastmilk and its effect on maternal breastfeeding self-efficacy in the postpartum period and breastfeeding practice.

3.3 **Quantitative hypothesis**

3.3.1 **Primary hypothesis**

Women who expressed breastmilk antenatally enhanced their postnatal breastfeeding self-efficacy compared to women who did not express breastmilk antenatally.

3.3.2 **Secondary hypothesis**

Women who expressed breastmilk antenatally were more likely to exclusively breastfeed their infants.

3.4 **Qualitative objectives**

The qualitative component of this study focused on exploring:

1. maternal experiences of AHE of breastmilk and how it affects infant feeding practice
2. maternal perceptions of contemporary antenatal and early postnatal breastfeeding education and support, including breastmilk expression and AHE.

3.5 **Conceptual framework**

Self-efficacy has drawn attention in the health sciences as a useful and widely used theoretical framework for research. Self-efficacy is defined as a person's belief in their capability to produce certain levels of achievement (see Chapter 2; Bandura 1977b). Further, self-efficacy contributes significantly to personal performance outcomes (Bandura 1977b). The concept of personal capability comprises numerous elements that are affected by self-efficacy. Notably, personal capability requires not only skills and knowledge but also self-belief or efficacy; therefore, people may perform poorly, adequately or competently depending on fluctuations in their self-efficacy level (Bandura 1994). Further, some people regard capability as an acquirable proficiency that can be increased by gaining knowledge and skills (Bandura 1977a; Schwarzer 2014), and they consider errors and challenges a natural part of the learning process (Bandura 1977a). However, others view capability as an inherent or fixed capacity

(Bandura 1977a), and they consider their poor performances a failure or personal threat and typically avoid challenges while achieving tasks (Bandura 1977a). Figure 3.1 illustrates a diagram of the concept of capability, which was developed based on Bandura's (1977b) SCT.

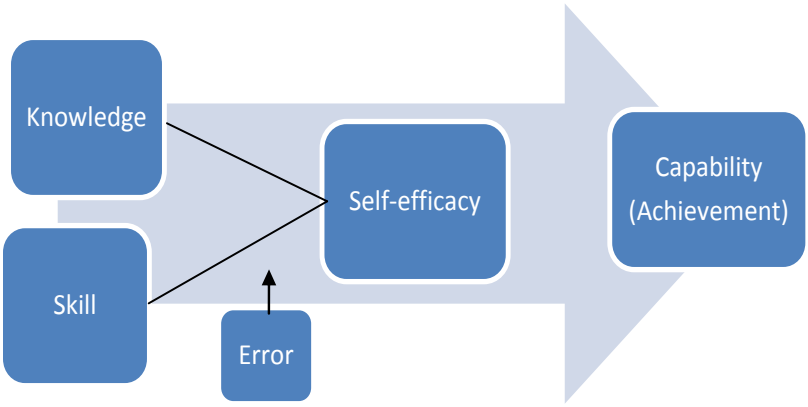

Figure 3.1: Concept of capability (Bandura 1977b)

'Maternal breastfeeding self-efficacy' refers to a woman's perceived capability or confidence regarding breastfeeding her infant (Dennis & Faux 1999). Breastfeeding self-efficacy affects a woman's decisions regarding breastfeeding behaviours, including the amount of effort she expends on a task and how she manages difficulties that may occur during her breastfeeding journey (Bandura 1977b). For example, a mother with a high level of breastfeeding self-efficacy can overcome her breastfeeding challenges and devote significant effort to breastfeeding her infant successfully.

A person's level of self-efficacy is influenced by four antecedent factors: mastery experience, vicarious experience, social persuasion, and positive physiological and affective states (Bandura 1994). These four antecedent factors are proposed to be central to developing maternal breastfeeding self-efficacy, with each factor engaging with the

others (Bandura 1994). Demonstrably, AHE affects these four antecedent factors in a manner that enhances maternal breastfeeding self-efficacy (Bandura1994). Firstly, mastery experience is the most significant factor for creating a strong sense of self-efficacy (Bandura 1994). For example, an infant who is correctly positioned and attached at the breast increases a mother's breastfeeding self-efficacy; additionally, a previous positive breastfeeding experience strengthens maternal confidence in a mother's current ability to breastfeed and manage potential breastfeeding problems (Dennis 1999). Secondly, vicarious experience involves appropriating others' accomplishments and increases the observer's motivation and beliefs (Dennis1999). Peer support groups in which other women are successfully breastfeeding and using encouraging language can affect a woman's breastfeeding ability positively (Dennis1999). Thirdly, social persuasion requires family members, friends and health professionals to give breastfeeding mothers appropriate advice and encouragement (Dennis1999). Notably, family members and health professionals making negative comments about breastfeeding can cause a woman to lose confidence in her ability to breastfeed (Dennis1999). Last, positive physiological and affective states not only reduce a woman's negative stress reactions to new challenges or adverse events but also change her negative emotional thoughts and interpretations of physical states, enabling her to manage these new challenges or adverse events (Dennis1999). People with a high sense of self-efficacy typically consider a challenge or difficult situation a natural part of learning that provides them opportunities with which to expand their knowledge and competencies. However, people with high self-doubt consider challenges a threat (Bandura 1977a).

Notably, many researchers in the field of midwifery and nursing have developed breastfeeding self-efficacy measurement tools that were derived from Bandura's SCT

(Cleveland & McCrone 2005; Dennis 2003; Dennis & Faux 1999; Wells, Thompson & Kloeblen-Tarver 2006). Figure 3.2 is a correlation diagram of breastfeeding self-efficacy, which was developed based on Bandura's (1977a) SCT. To examine the effect and experience of AHE on maternal breastfeeding self-efficacy in both a quantitative and qualitative approach, this research used not only Bandura's SCT but also a tool that measured maternal breastfeeding self-efficacy that was adapted from Bandura's SCT.

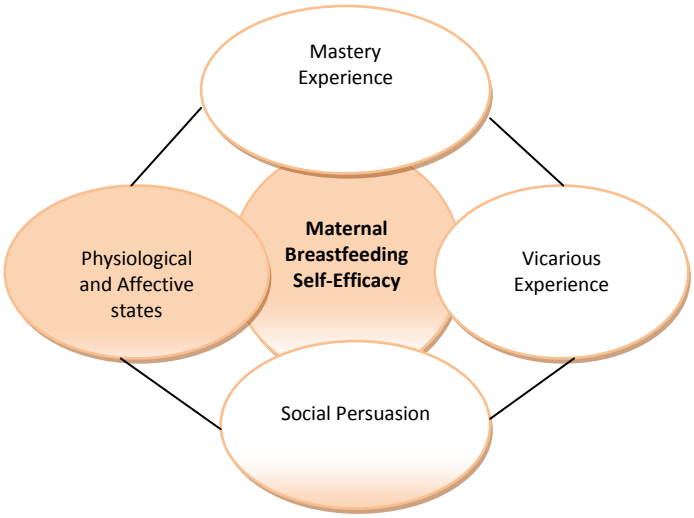

Figure 3.2. Breastfeeding self-efficacy correlation (Bandura 1977a)

3.6 **Research design**

A cross-sectional web-based survey that included quantitative and qualitative questions was used to compare maternal breastfeeding self-efficacy of those who did and did not express breastmilk antenatally. The following software was used in this research to collect and manage data and to assist with analysis: Research Electronic Data Capture (REDCap) (Harris et. al. 2009), Microsoft Excel, IBM Statistical Package for the Social Sciences (IBM SPSS Statistics 24.0) and NVivo 12.

3.7 **Research instruments**

Two instruments (i.e., the Infant Feeding Practice Questionnaire and the BSES-SF) and three qualitative questions were included in the online survey (see Appendix A).

The Infant Feeding Practices Questionnaire was based on those developed by Xu* et al. (2007; see Appendix B). The original questionnaire has been used extensively in breastfeeding cohort studies in Australia, China, Vietnam and Kenya (Xu et al. 2007) and was used to capture socio-demographic data and information regarding pregnancy, birth, the postpartum period and infant feeding practices. The questionnaire was modified according to this study's aims, and the content validity of the modified version was discussed and reviewed using face validity. This review included the following considerations: the questions' conception, the questionnaire's construction and the questions' inclusion and exclusion parameters in relation to this study's aim.

Currently, there are numerous breastfeeding self-efficacy measurement tools available that were derived from Bandura's (1977a) SCT. The following tools were considered in this research as they are commonly used as measurement tools:

1. **Breastfeeding Self-Efficacy Scale (BSES):** Dennis and Faux (1999) used SCT (Bandura 1977a) to enable the measurement of postpartum mothers' breastfeeding self-efficacy. The BSES has 33 items and uses a five-point Likert scale with scores ranging from 33 to 165. The overall content validity index score was 0.86, suggesting strong content validity; regarding its construct

* Dr Xu is one of the supervisors and researchers of this research.

validity, Cronbach's alpha was reliability 0.96 (Dennis & Faux 1999; Tuthill et al. 2017; Walker 2017).

Breastfeeding Self-Efficacy Scale Short-Form (BSES-SF): Dennis (2003) developed a shorter version of the BSES. The BSES-SF has 14 items and uses a five-point Likert scale with scores range from 14 to 70. Regarding its construct validity, Cronbach's alpha was 0.94 (Dennis 2003; Tuthill et al. 2017).

Prenatal Breast-feeding Self-efficacy Scale (PBSES): Wells, Thompson and Kloeblen-Tarver (2006) applied Bandura's (1977a) SCT to measure prenatal breastfeeding self-efficacy. The PBSES has 20 items and uses a five-point Likert scale with scores range from 20 to 100. Its overall content validity index score was 0.90; regarding its construct validity, Cronbach's alpha was 0.89 (Tuthill et al. 2017; Wells, Thompson & Kloeblen-Tarver 2006).

Breastfeeding Personal Efficacy Beliefs Inventory (BPEPI): Cleveland and McCrone (2005) applied Bandura's (1977a) SCT to measure prenatal breastfeeding self-efficacy. The BPEPI has 24 items with scores range from 0 to -100, Cronbach's alpha of 0.89. Its predictive validity was not measured. However, results indicated that high scores were correlated with exclusive breastfeeding in the early weeks postpartum.

Considering the characteristics of the self-efficacy measurement tools, it was decided that the BSES-SF was the most appropriate measure with which to examine maternal breastfeeding self-efficacy in the postpartum period (permission to use the BSES-SF was obtained from Professor Dennis [see Appendix C]). The BSES-SF is a shorter version of the BSES, and the former's scores correlated significantly with those of the latter, indicating a high Cronbach's alpha coefficient. The BSES-SF not only is easier and quicker to administer than its predecessor but also reliably measures breastfeeding self-efficacy in the postpartum period and identifies women at risk of early

breastfeeding cessation (Dennis 2003). The PBSES's and BPEPI's scores strongly correlated with exclusive breastfeeding, but these tools were designed to measure pregnant women's breastfeeding self-efficacy.

Additionally, three open-ended questions were developed and included in the online survey to explore women's experiences of AHE and their perceptions of breastfeeding education (see Section 3.12).

3.8 **Participant recruiting**

Initially, participants were recruited through one Facebook page and one online forum. The Facebook page was that of the Tresillian Family Care Centre,[*] a New South Wales non-profit early parenting organisation that provides parenting and infant feeding information and support services to parents and families with children from birth to five years old. The forum page was that of The Bub Hub,[*] an Australian pregnancy and parenting website that provides parenting and feeding information. Further, an amendment was submitted to the Human Research Ethics Committee of the Sydney Local Health District (SLHD) to expand the recruitment of women through the Facebook page of Australian mothers' group. This additional recruitment strategy was to achieve an adequate sample size of 400 mothers for data analysis. This additional Facebook page included the Sydney Mums Group,[‡‡] a group in which for mums to ask questions, seek advice, share experiences and join a vibrant and supportive community in Sydney, Australia.

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[*] See <https://www.facebook.com/TresillianEarlyParenting/>.

[*] See <https://www.bubhub.com.au/community/forums/forumdisplay.php?129-Help-Wanted!>.

[‡‡] See < https://www.facebook.com/sydneymumsgroup/>.

This recruitment process occurred across six months from 4 December 2018 to 14 May 2019. When participants clicked on the link to REDCap, they were taken to a study information page; this page included questions that assessed their eligibility to participate in the study and a link for them to provide informed consent and agree to participate in the study.

3.9 **Research population**

The study population comprised of postpartum women with an infant aged up to six months. An inclusion and exclusion statement with a checkbox for consent that was positioned after the information survey was used as a screening mechanism. Inclusion and exclusion criteria were used during the online consenting process to ensure only women who fulfilled the inclusion criteria answered the survey questions (see Table 3.1). If women did not fulfil the inclusion criteria, they were directed to a page that thanked them for their time and politely informed them that they did not meet the criteria for participation.

Table 3.1: Participant inclusion and exclusion criteria

Inclusion criteria
• Women who are up to six months postpartum. • Women who can read and write English. • Both women who did and did not perform AHE. • Women who breastfed, mixed-fed or bottle-fed their infant during the six-month postpartum period.
Exclusion criteria
• Women with an infant seven months or older. • Women who are unable to read and write English. • Women who did not agree to participate in the survey.

Note. AHE = antenatal hand expression.

This study did not focus on a specific cultural group. Although the survey requested their country of birth, the women were not asked if they identified as Aboriginal and Torres Strait Islander. Additionally, no one was excluded due to cultural background (see Appendix A). Further, the origin of the responses could not be identified because once participants clicked on the REDCap link, they were taken to a study information page, where the pathway they had taken to reach the survey was unavailable.

To recruit sufficient numbers of participants, the recruitment advertisement was posted four times on the Tresillian Early Parenting Facebook page, once on the Sydney Mums Facebook group and once on The Bub Hub webpage.

3.10 **Sample size**

The results of Forster et al.'s (2011) study were used to determine the sample size to compare breastfeeding rates between the AHE group and non-AHE group. The results showed that 59.5% (n = 25/42) of infants whose mothers expressed breastmilk antenatally received breastmilk exclusively within 24 hours postpartum, whereas only 43.9% (n = 36/82) of infants whose mothers did not express breastmilk antenatally received breastmilk exclusively in the 24 hours postpartum. A sample size of 320 women was considered large enough to test the difference between two groups, with 160 women in each group (Dean AG et.al. 2013). Open Source Epidemiologic Statistics for Public Health (2013) was used to calculate the sample size (see Table 3.2).

Table 3.2: Sample size calculation

Two-sided significance level(1-alpha):			95
Power(1-beta, % chance of detecting):			80
Ratio of sample size, Unexposed/Exposed:			1
Percent of Unexposed with Outcome:			44
Percent of Exposed with Outcome:			60
Odds Ratio:			1.9
Risk/Prevalence Ratio:			1.4
Risk/Prevalence difference:			16
	Kelsey	**Fleiss**	**Fleiss with CC**
Sample Size - Exposed	161	160	172
Sample Size-Non exposed	161	160	172
Total sample size:	322	320	344

A total of 691 women accessed to the survey (this number includes those who only partially completed the survey or who were excluded). A total of 576 women were included in the data analysis process following 115 responses being excluded as they did not meet the inclusion criteria or respondents had not answered any questions (see Figure 3.3). In particular, a total of 30 responses were excluded because the respondents indicated one of the following: that they had infants who were seven months or older, that they were unable to read and write English or that they did not agree to participate in the survey. Additionally, a total of 85 responses were excluded as the respondents did not answer any of the survey questions. The total number of participants and their demographic and clinical characteristics are presented in Table 3.3 and Table 3.4.

The survey consisted of 31 quantitative questions, including multiple-choice questions, closed questions, the BSES-SF and three qualitative, open-ended questions.

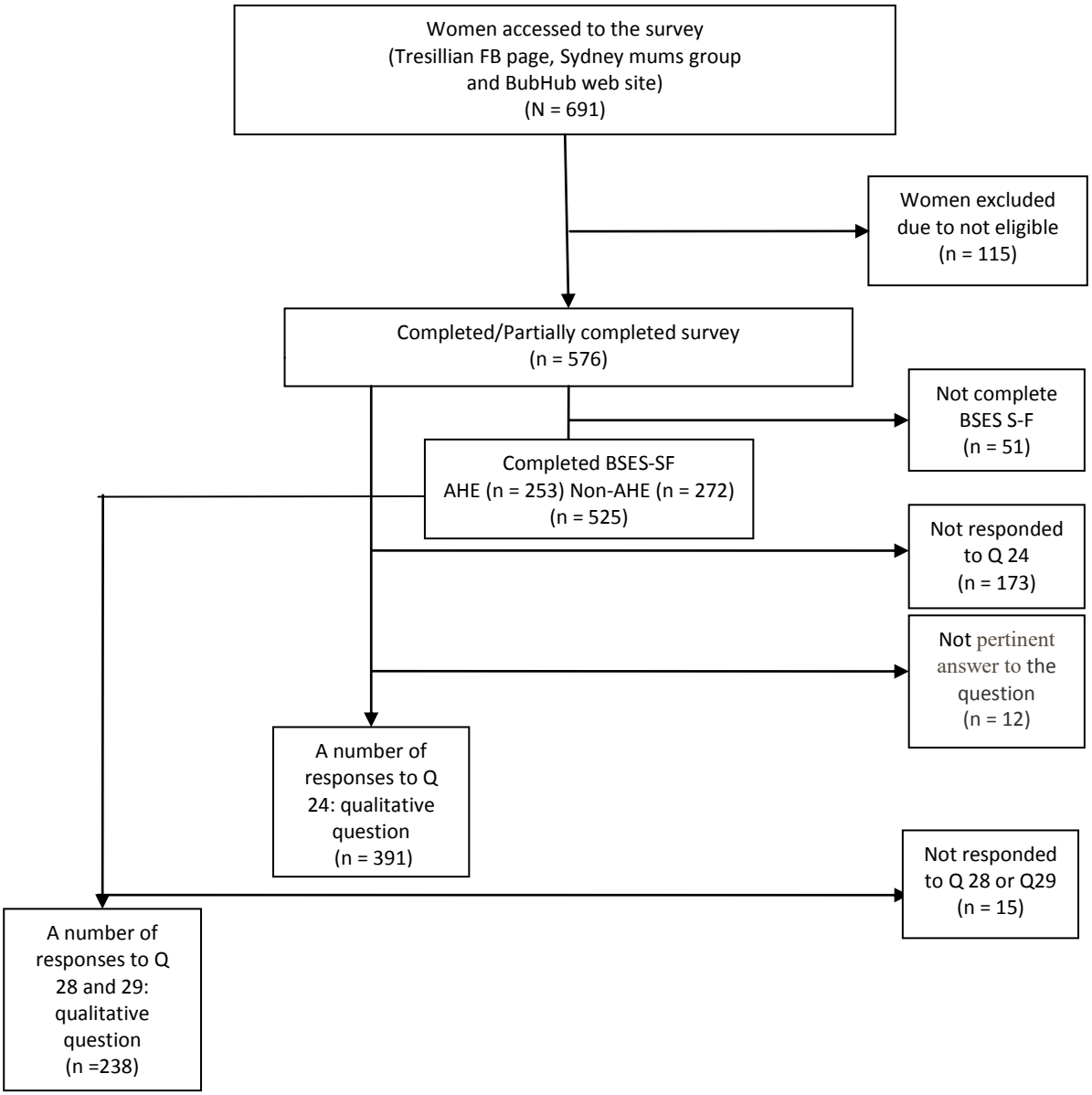


Figure 3.3: Participants' movement through the research

Note. FB = Facebook; BSES-SF = Breastfeeding Self-Efficacy Scale Short-Form; AHE = antenatal hand expression.

Table 3.3: Demographics of all respondents

Variable	Value	Number	%
Maternal age	<30	167	29.0
	30+	409	71.0
	Total	576	100.0
Country of birth	Non Australian	86	14.9
	Australian	490	85.1
	Total	576	100.0
Marital status	Married	507	88.0
	Unmarried	69	12.0
	Total	576	100.0
Employment	Employed	474	82.3
	Not employed	102	17.7
	Total	576	100.0
Marital education level	High school and below	52	9.0
	Professional training (e.g:TAFE)	100	17.4
	University (Undergraduate)	213	37.0
	University (Postgraduate)	210	36.5
	Missing	1	0.2
	Total	576	100.0
Total family income for the past 12 months	$60,000 and less	41	7.1
	Greater than $60,000	535	92.9
	Total	576	100.0
Occupation	Health professorial	118	20.5
	Non health professional	165	28.6
	Office work	242	42.0
	Housewife	38	6.6
	Others	13	2.3
	Total	576	100.0

Table 3.4: Clinical characteristics of all respondents

Variable	Value	Number	%
Gestational age	<=36weeks	36	6.3
	37weeks and over	540	93.8
	Total	576	100.0
Number of children	First	342	59.4
	2nd child	182	31.6
	3rd child or more	52	9.0
	Total	576	100.0
Birth weight	Less than 2500g	30	5.2
	2500-3000g	80	13.9
	3001-3500g	236	41.0
	3501-4000g	170	29.5
	4001g-over	60	10.4
	Total	576	100.0
Smoke cigarettes during pregnancy	No	567	98.4
	Yes	9	1.6
	Total	576	100.0
Alcohol during pregnancy	No	546	94.8
	Yes	30	5.2
	Total	576	100.0
Current age of child	Younger than 1 month old	55	9.5
	1 month to 3 months old	236	41.0
	4 months to 6 months old	285	49.5
	Total	576	100.0
Current feeding method	Breastfeeding only	192	33.3
	Mixed feeding	248	43.1
	Formula feeding	136	23.6
	Total	576	100.0

3.11 **Quantitative data approach and analysis**

Descriptive techniques were used to document breastfeeding rates, percent of AHE and demographic factors. Chi-square test and logistic regression were used to compare breastfeeding rates and the demographic and clinical characteristics of the two groups (i.e., those who practised AHE and those who did not). A p-value of < 0.05 was considered to indicate statistical significance. The BSES-SF was analysed using mean, median and multivariate logistic and linear regression. Odds ratios were presented. The quantitative data analysis was completed using Excel and IBM SPSS Statistics 24.0.

3.12 **Qualitative data approach and analysis**

In this research, Template Analysis was used with the three qualitative, open-ended questions. Template Analysis is a group of techniques for thematically organising and analysing textual data (King 2004), and it is a flexible technique that has specified procedures when using an a priori template to code the data (King 2004). A main feature of Template Analysis is the hierarchical organisation of codes, with groups of similar codes (subthemes) clustered together to produce main themes (Brooks et al. 2015). The data involved can be interview transcripts, diary entries, transcribed electronic interviews or open-ended question responses on a written questionnaire (Brooks et al. 2015). Template Analysis can be used within a range of epistemological positions, including:

1. a ‘realist’ position to discover underlying causes of human action and phenomena
2. a ‘contextual constructivist’ position to interpret any phenomenon in a specific social context

3. a ‘subtle realist’ position to acknowledge that phenomena are independent, but that interpretation of the phenomena is influenced by the researcher (Brooks et al. 2015).

In this research, a realist position was taken to determine the underlying causes of human action and certain human phenomena.

It is acceptable to start with speculative themes or a priori codes that may help and prove relevant for further analysis (Brooks et al. 2015; Symon & Cassell 2012). The approach used to analyse the three questions required six steps:

1. Read a subset of women’s responses to become familiar with the account to be analysed.
2. Read and re-read and complete preliminary data coding with the identified a priori themes (see Table 8) in advance as this will likely help and be relevant to the analysis.
3. Organise the codes into meaningful themes and define the relationships within and across those themes.
4. Develop the initial template.
5. Refine themes and insert them into the template.
6. Finalise the template for data analysis.

The survey data that were used included the responses to three open-ended questions that encouraged the women to express their thoughts in their own words (see Table 3.5).

Table 3.5: Three qualitative questions

Questions	Responses received*
Question 24: In thinking about the type of breastfeeding education (either antenatal or postnatal) you received, what additional information would you have liked to have received?	403**
Question 28***: Please describe your antenatal experiences of hand expressing and storing colostrum.	221
Question 29***: How did your experience of AHE influence your choice of infant feeding method?	52

*A total of 576 responses to the survey (completed or partially completed) were received. **Of these, 12 responses were not pertinent, so only 391 responses were used. ***The women's responses to questions 28 and 29 were combined for the data analysis as there were similar and overlapping responses—the number of combined responses was 238 (35 women answered both questions).
Note. AHE = antenatal hand expression.

3.13 **A priori coding template**

In this research study, the a priori coding template was created using not only the findings from the literature review but also the research questions to focus on the main concept used within this research, which were antecedent factors that positively or negatively affected the development of maternal breastfeeding self-efficacy (see Table 3.6). This a priori coding template used an iterative approach to develop the final version of the analysis template used to code women's responses.

Table 3.6: The a priori coding template

Areas of Questions	Quotations
Mastery experience (confidence)	
Vicarious e*xperience* (learning from watching others)	
Social persuasion (encouragement)	
Positive physiological and affective states (challenges or stress)	
Security	

After reading and re-reading the data, it was identified that this coding template did not provide sufficient detail to provide the depth of analysis necessary to fully utilise the participants' experiences. Therefore, this analysis template was developed further.

3.13.1 **Development of the final version of the templates**

Two different a priori coding templates were developed and reviewed. The final version of the template for Question 24 and a template for the combined questions 28 and 29 were developed using the six steps discussed in Section 3.12.

3.13.1.1 Women's perceptions of desired breastfeeding education or support in the antenatal or postnatal periods

The initial coding template was created to analyse the data in the responses to Question 24. Two main themes were identified (see Table 3.7).

Table 3.7: Women's perceptions of desired antenatal or postnatal breastfeeding education

(initial template)

Main Themes	Subthemes
• Development of maternal breastfeeding self-efficacy	• Individualised one-on-one support or support from an LC • Expressing breastmilk or AHE • Provision of coping strategies and emotional support to increase confidence during pregnancy
• Various type of information about breastfeeding	• The need for more general information about breastfeeding • Information for special needs and troubleshooting • A specific breastfeeding class or a class by the ABA • Information consistency

Note. LC = lactation consultant; AHE = antenatal hand expression; ABA = Australian Breastfeeding Association.

The data were constantly revised, categorised and modified using the Template Analysis approach to guide the coding of the responses. The final template comprised two main themes and eight subthemes (see Table 3.8).

Table 3.8: Women's perceptions of desired antenatal or postnatal breastfeeding education

(final template)

Main Themes	Subthemes
• Various types of assistance to develop maternal breastfeeding self-efficacy	• Individualised one-on-one support • Assistance with expressing breastmilk or AHE[***] • Provision of coping strategies and emotional support to increase confidence during pregnancy
• Various types of information to develop maternal breastfeeding self-efficacy	• More general breastfeeding information • A specific breastfeeding class • Follow-up guidance and information • Information for special needs and troubleshooting • Information consistency

Note. AHE = antenatal hand expression.

3.13.1.2 Women's experiences of AHE and its influence on infant feeding methods[**]

Questions 28 and 29 in the survey's qualitative component were used to address this study's second objective (see Table 3.5). The women's responses to these two questions were combined for the data analysis, as there were similar and overlapping responses. An initial template was created by utilising the a priori coding template, and the positive and negative effects of AHE were listed in separate tables (see Table 3.9 and Table 3.10).

[**]Some of the women did not specify if they were referring to expressing during the antenatal or postnatal period.

Table 3.9: Women's experiences of AHE (initial template, positive responses)

Main Themes	Subthemes
• Self-efficacy	• Mastery experience and confidence • Security • Social persuasion and encouragement • Familiarisation
• Risk group with breastfeeding	• Avoiding formula
• Other effects of AHE	• Stimulates labour • Softens breasts

Note. AHE = antenatal hand expression.

Table 3.10: Women's experiences of AHE (initial template, negative responses)

Main Themes	Subthemes
• Self-efficacy	• Challenges • Insufficient support from health professionals • Physiological and affective states and pain • Time consuming
• Fear of contractions	• Induced labour • Risk of premature labour

The qualitative research component focused on maternal breastfeeding self-efficacy. Therefore, themes that did not relate directly to this topic were excluded from the final template (see Table 3.11).

Table 3.11: Women's experiences of AHE and its influence on infant feeding methods (final template)

Main Theme	Subthemes
• Confidence in my body and developing self-efficacy	• Gaining mastery and confidence • Sense of security • Avoiding formula (risk groups with breastfeeding) • Social persuasion and encouragement
• Lack of confidence or self-efficacy	• Challenges • Insufficient support from health professionals • Physiological and affective states and pain

3.14 **Enhancing the trustworthiness of the qualitative data analysis**

Qualitative research is different from quantitative methods in terms of philosophical positions and purpose so that there are alternative frameworks for establishing findings' trustworthiness and rigour (Noble & Smith 2015; Shenton 2004). Five significant trustworthiness items enhance the rigour of qualitative research analysis, including credibility, transferability, dependability, confirmability and reflexivity. Researchers can determine which of these strategies to apply to their research.

3.14.1 **Credibility**

Credibility is one of the most important factors needed to establish trustworthiness and refers to the confidence that can be placed in the truth of the research findings (Elo &

Kyngäs 2008). Credibility establishes whether the research findings not only represent plausible information from participants' original data but also are a correct interpretation of participants' original views (Korstjens & Moser 2017). Several strategies were used to enhance the credibility of this study's findings.

Firstly, Bandura's (1977a) SCT—a theory that has been accepted in the health sciences—was adapted and used in the theoretical framework. Further, the BSES-SF—a tool with which to measure maternal breastfeeding self-efficacy that was derived from Bandura's (1977a) SCT—was used to analyse data. Additionally, two data collection methods were used to enhance the credibility of the data analysis: quantitative data collection, via the BSES-SF, of breastfeeding rates and qualitative data collection of women's perceptions of AHE and breastfeeding education.

Secondly, using an appropriate data sampling method was an important strategy that improved this study's credibility. Demonstrably, women were recruited via two Facebook pages and one webpage to complete an online survey. This sampling method ensured that a diverse range of respondents and an adequate sample size were obtained. A total sample was reached, including 369 participants having responded to Question 24 and 188 participants having responded to questions 28 and 29. These responses easily reached saturation during the data analysis process.

Thirdly, Template Analysis was used for the qualitative data analysis. This is a well-established and credible qualitative analysis method (King 2004). The initial templates were developed by using the available literature and the self-efficacy work of several researchers and by reading and re-reading the data to assist in its analysis and categorisation. The template was revised repeatedly in the early stages of the analysis process.

Lastly, regular supervision meetings were held to review the template's formation. The ongoing data analysis process and to gain consensus with the coding outcomes were regularly reviewed and verified during these meetings.

3.14.2 **Transferability**

Transferability refers to the degree to which the results of qualitative research can be transferred to other settings with other participants (Kuper, Lingard & Levinson 2008). Researchers are responsible for providing thick descriptions of participants and detailed descriptions of the research process so readers can identify whether the findings are transferable to their own setting. This research employed several strategies with which to increase its transferability. First, the participants' attributes, the sampling methods and the strategy of the data analysis were clearly documented. Second, the inclusion and exclusion criteria and participants' socio-demographic details were described. Third, the online survey was advertised on particular websites that many women with infants would visit to seek breastfeeding or parenting advice. Last, a Template Analysis approach was adapted to guide the data analysis process; this method assisted the researchers to not only maintain focus on this study's qualitative objectives but also understand the participants' experience.

3.14.3 **Dependability and confirmability**

Dependability refers to the stability of findings through the research process (Noble & Smith 2015). To ensure high dependability, the analysis process was checked during this study's research process to establish whether it met the accepted standards for the particular research design that was used (Noble & Smith 2015). Additionally, confirmability defines the degree to which the research findings could be confirmed by other researchers; this includes confirming the findings' neutrality as investigators

should not interpret data based on their preferences or viewpoints (Noble & Smith 2015). To enhance the confirmability of this study's findings, Bandura's (1977a) SCT was used to develop the initial template, inclusion and exclusion criteria were clearly identified and used to recruit survey respondents, and the coding templates and decisions that were made through all the processes were discussed with the study's supervisors.

3.14.4 **Reflexivity**

Reflexivity refers to the process of critical self-reflection as a researcher to identify biases against, preferences for, perceptions of and relationships to the participants that may influence the research outcomes, which includes researchers' role in the process of data collection, analysis and interpretation (Rosen et al. 2008). As an experienced midwife I was aware of the risk of being an insider when conducting this research and how this positioning could have influenced the data analysis. However, the insider/outsider dichotomy is always fluid in its positioning with both positions needing to be acknowledged (Toy-Cronin 2018). A major concern is role conflict (Toy-Cronin 2018). However, as the data collection was via an online survey this role conflict is minimised as there is no contact between the researcher and the women responding to the survey. Having this awareness has ensured reflexive strategies to be implemented. To increase reflexivity, a reflective process occurred during each stage of this research study to examine the conceptual lens, the explicit and implicit assumptions and the values regarding the survey respondents' statements and how these affected the analysis of the data. As part of this process, records of methodological decisions and the reasons for them, the logistics of the study and the challenges or issues experienced during each

stage of the research process were recorded for use in self-reflection and during supervision sessions.

3.15 **Data management and storage**

The Australian Code for the Responsible Conduct of Research emphasised that data management in research is one of the most important elements under the Code's legal requirements and professional standards (NHMRC 2007). This requires that:

> researchers must ensure that the security and privacy measures that are used research data and primary material are proportional to [the] risk associated with the confidentiality or sensitivities of these data and materials. (NHMRC 2019, p. 7)

Researchers must consider the identifiability of data and information to assess the risk of harm or discomfort to either research participants or others who may be at risk. To optimise project efficiency and avoid information loss, researchers are required to apply a well-designed management plan and practices. The following factors were implemented to ensure the security of this study's data: stable, secure (password protected) storage with regular backups to an external secure source (i.e., the researcher's personal computer), document management that included version control and workflow documentation with provenance information (NHMRC 2019).

Two types of data were collected for this research project: statistical data (i.e., baseline data and BFSES-SF data) and qualitative data from open-ended questions. These data were stored in digital form using REDCap. Further, any data retrieved from REDCap were stored on a password-protected computer and CloudStor and will be kept for a

minimum of five years in a secure location at UTS after the completion of this study, as required.

3.16 **Ethics considerations and confidentiality**

'Research ethics' refers to ethical conduct and protecting research participants. Research ethics involves not only people, personal data and human tissue but also research involving animals. The NHMRC (2007) promotes ethical human research and fosters research that benefits people and the community. Therefore, the National Statement was designed to clarify the responsibilities of research merit, justice, beneficence and respect (NHMC 2019). Research merit requires that the research not only contributes to knowledge and understanding and the skill and expertise of researchers but also improves social welfare and individual wellbeing (NHMC 2019). Justice requires the selection, exclusion and inclusion of categories of research participants to be fair and accurately described in the research results. Beneficence requires that the benefits of the research must justify any risks of harm or discomfort to participants (NHMRC 2019); the benefit may be to the participants, to the wider community or both. Finally, respect requires that researchers have due regard for the welfare, beliefs, perceptions, customs and cultural heritage (individual and collective) of those involved in the research (NHMC 2019).

Ethical clearance must be obtained when commencing any research project involving human or animal participants. For this research, ethics approvals (see Appendix E), including the approval of amendment (see Appendix F), were obtained from the following:

- the Human Research Ethics Committee of SLHD (approval number: X18-0293& HREC/18/RPAH/399)
- the Tresillian Family Care Centre (site-specific clearance; see Appendix G)
- The Bub Hub (site clearance; see Appendix H)

Further, the UTS ratified the research study (approval number: ETH18-2965; see Appendix I and Appendix J).

A consent message was displayed for the participants at the beginning of the survey and included the voluntary nature of their participation in this study, the risks and benefits and the procedures in place to maintain confidentiality (see Appendix A). Participants' identifying information (i.e., quasi-identifiers), such as name, email address or IP address, were not collected for this research (see Appendix A). The data that would have likely enabled an individual to be identified, such as age, income and profession, were combined or rounded in ranges (Office of the Australian Information Commissioner 2018). Only the researcher and the supervisors have access to these raw data. The data were also amalgamated to further reduce any risk of participant identification. Further, study codes were used on data documents to protect participants' confidentiality and anonymity (NHMRC 2007).

If the participants had questions or concerns regarding this research, they could contact the researcher, research supervisors or the ethics committee at SLHD or UTS. The researcher ensured that all participants were provided with detailed information regarding this survey's aim. Participants were also advised to contact Lifeline, a local GP or an appropriate health professional in the event that they became emotionally distressed while responding to the survey. The results of this study will be disseminated

via peer-reviewed publications, conferences and a newsletter to be published on the Tresillian Family Care Centre's Facebook page.

3.17 **Summary**

This chapter has described not only the quantitative and qualitative methods and the processes of data collection and analysis that were used in this study but also the details of data management and the ethical considerations for this research. The research explored the effect of AHE on maternal breastfeeding self-efficacy, breastfeeding outcomes, maternal experiences of AHE and speculated maternal perceptions of contemporary breastfeeding education by using both quantitative and qualitative methods that were involved in descriptive statistics of analysis (quantitative) and Template Analysis (qualitative).

CHAPTER 4: **THE EFFECT OF AHE ON MATERNAL BREASTFEEDING SELF-EFFICACY AND BREASTFEEDING OUTCOMES (quantitative study)**

4.1 **Introduction**

Breastfeeding has been called a 'confidence trick' (Ward 2000, p. 44) requiring a woman to have a positive attitude about her ability to breastfeed her infant. Notably, maternal breastfeeding confidence or self-efficacy improves breastfeeding outcomes (Blyth et al. 2002). One factor that enhances self-efficacy the most is an opportunity to have a mastery experience (Bandura 1977a). Therefore, mastering the skills and having positive experiences of AHE can be a strategy that significantly enhances the self-efficacy of women who wish to breastfeed their infants.

4.1.1 **Hypothesis**

4.1.1.1 Primary hypothesis

Women who expressed breastmilk antenatally enhanced their postnatal breastfeeding self-efficacy compared to women who did not express breastmilk antenatally.

4.1.1.2 Secondary hypothesis

Women who expressed breastmilk antenatally were more likely to exclusively breastfeed their infants.

This chapter identifies the effect of AHE in accordance with the following findings:

7. comparison of maternal breastfeeding self-efficacy between the group that performed AHE and the group that did not, using the BSES-SF
8. comparison of current feeding methods between the group that performed AHE and the group that did not
9. effect of AHE on 'exclusive breastfeeding' and 'any breastfeeding' after adjusting for demographic and clinical factors.

4.2 **Data analysis**

A chi-square test was used to compare the two groups' demographics, clinical characteristics and breastfeeding rates. A p-value of < 0.05 was used to indicate statistical significance. Mean, median and multivariate logistic and linear regressions and odds ratios were calculated and are presented in this chapter. The quantitative data analysis was completed using IBM SPSS Statistics 24.0.

4.3 **Findings**

A total of 691 women responded to this survey; of them, 525 women (AHE = 253, non-AHE = 272) completed the BSES-SF.

4.3.1 **Baseline characteristics**

The majority of demographics and clinical characteristics among the two groups who responded to the BSES-SF were not significantly different, except for occupation and smoking (see Table 4.1 and Table 4.2). Demonstrably, there were more professional women in the AHE group than in the non-AHE group ($p = 0.03$). Further, more women in the non-AHE group (2.9%) smoked cigarettes during pregnancy than women in the AHE group did (0.4%; $p = 0.03$).

Table 4.1: Demographics of selected respondents

Variable	Value	Mother	AHE		Non-AHE		p-value
			Mother	%	Mother	%	
Maternal age	<30	151	83	32.81	68	25.00	0.48
	30+	374	170	67.19	204	75.00	
	Total	525	253	100.00	272	100.00	
Country of birth	Non Australian	77	30	11.86	47	17.28	0.79
	Australian	448	223	88.14	225	82.72	
	Total	525	253	100.00	272	100,00	
Marital status	Married	462	217	85.77	245	90.07	0.13
	Unmarried	63	36	14.23	27	9.93	
	Total	525	253	100.00	272	100.00	
Employment	Employed	432	213	84.19	219	80.51	0.27
	Not employed	93	40	15.81	53	19.49	
	Total	525	253	100.00	272	100.00	
Maternal education level	High school and below	48	23	9.09	25	9.23	0.91
	Professional training (e.g:TAFE)	95	49	19.37	46	16.97	
	University (Under graduate)	192	92	36.36	100	36.90	
	University (Postgraduate)	189	89	35.18	100	36.90	
	Total	524	253	100.00	271	100.00	
Total family income for the past 12 months?	$60,000 and less	39	23	9.09	16	5.88	0.16
	Greater than$60,000	486	230	90.91	256	94.12	
	Total	525	253	100.00	272	100.00	
Occupation	Health professorial	105	58	22.92	47	17.28	0.03
	Non health professional	54	82	32.41	72	26.47	
	Office worker	220	88	34.78	132	48.53	
	Housewife	33	17	6.72	16	5.88	
	Others	13	8	3.16	5	1.84	
	Total	525	253	100.00	272	100.00	

Note. AHE = antenatal hand expression.

Table 4.2: Clinical characteristics of selected respondents

Variable	Value	Mother	AHE		Non-AHE		p-value
			mother	%	mother	%	
Gestational age	<=36weeks	33	11	4.35	22	8.09	0.08
	37weeks and over	492	242	95.65	250	91.91	
	Total	525	253	100.00	272	100.00	
Number of children	First child	307	144	56.92	163	59.93	0.20
	2nd child	172	81	32.02	91	33.46	
	3rd child or more	46	28	11.07	18	6.62	
	Total	525	253	100.00	272	100.00	
Birth weight	Less than 2500g	29	11	4.35	18	6.62	0.09
	2500-3000g	70	32	12.65	38	13.97	
	3001-3500g	215	94	37.15	121	44.49	
	3501-4000g	155	82	32.41	73	26.84	
	4001g-over	56	34	13.44	22	8.09	
	Total	525	253	100.00	272	100.00	
Smoke cigarettes during pregnancy	Yes	9	1	0.40	8	2.94	0.03
	No	516	252	99.60	264	97.06	
	Total	525	253	100.00	272	100.00	
Alcohol during pregnancy	Yes	30	15	5.93	15	5.51	0.84
	No	495	238	94.07	257	94.49	
	Total	525	253	100.00	272	100.00	
Birth method	Vaginal	347	161	63.64	186	68.38	0.25
	Caesarean section	178	92	36.36	86	31.62	
	Total	525	253	100.00	272	100.00	
Age of child	Younger than 1 month old	48	25	9.88	23	8.46	0.54
	1 month to 3 months old	213	107	42.29	106	38.97	
	4 months to 6 months old	264	121	47.83	143	52.57	
	Total	525	253	100.00	272	100.00	
First feeding method	Breastfeeding	448	216	85.38	232	85.29	0.10
	Formula	18	5	1.98	13	4.78	
	Expressed breast milk	52	28	11.07	24	8.82	
	Water	3	3	1.19	0	0.00	
	IV drip	4	1	0.40	3	1.10	
	Total	525	253	100.00	272	100.00	
Current feeding method	Breastfeeding only	175	89	35.18	86	31.62	0.67
	Mixed feeding	220	102	40.32	118	43.38	
	Formula feeding	130	62	24.51	68	25.00	
	Total	525	253	100.00	272	100.00	

Note. AHE = antenatal hand expression.

4.3.2 **Comparison of BSES-SF scores between AHE and Non-AHE groups**

The overall BSES-SF scores for the AHE and non-AHE groups were not significantly different (p = 0.40 by chi-square test). In women who did perform AHE, *M* = 53.90 (95% CI [52.37–55.44]); in women who did not perform AHE, *M* = 52.97, (95% CI [51.44–54.50]). The BSES-SF scores by infant's age are detailed in Table 4.3.

Table 4.3: BSES-SF scores of selected respondents

Baby's age	AHE before birth	N	Mean	Median	95% *CI* for Mean		p-Value
< 1 month	Yes	25	49.68	54.0	45.37	53.99	0.69
	No	23	48.43	50.0	43.59	53.28	
	Total	48	49.08	50.5	45.97	52.19	
1-3 month	Yes	107	52.93	56.0	50.42	55.43	0.88
	No	106	52.65	55.0	50.17	55.13	
	Total	213	52.79	55.0	51.04	54.54	
4-6 month	Yes	121	55.64	57.0	53.48	57.79	0.27
	No	143	53.94	56.0	51.81	56.08	
	Total	264	54.72	57.0	53.21	56.23	
Overall	Yes	253	53.9	56.0	52.37	55.44	0.40
	No	272	52.97	55.0	51.44	54.50	
	Total	525	53.42	56.0	52.34	54.50	

4.3.3 **Comparison of BSES-SF scores between AHE-stored breastmilk, AHE-not stored breastmilk and Not AHE groups.**

Further, the BSES-SF scores (< 60 and ≥ 60) were compared between the three groups (AHE-stored breastmilk, AHE-not stored breastmilk and non-AHE). The finding is presented in Table 4.4.

Table 4.4: Comparison of BSES S-F scores between the group of AHE-Stored breastmilk, AHE-not stored breastmilk and not AHE

Group	n	Score<60				Score≥60			
		Woman	%	95% CI		Woman	%	95%CI	
AHE and stored	175	98	56.00	46.17	65.83	77	44.00	32.91	55.09
AHE but not stored	78	61	78.21	67.85	88.57	17	21.79	2.17	41.41
Not AHE	272	172	63.24	56.03	70.45	100	36.76	27.31	46.21
Total	525	331	63.05	57.85	68.25	194	36.95	30.16	43.74

X^2=11.43, P<0.003.

The BSES S-F score in the AHE-stored breastmilk group was highest amongst three groups (AHE-stored breastmilk: 44.0%, AHE -not stored breastmilk: 21.8% and Not AHE: 37%). Women who expressed breastmilk and stored it antenatally were more likely to have higher maternal breastfeeding self-efficacy compared with those who expressed breastmilk but did not store it antenatally ($p < 0.05$).

Compared BSES S-F score with women who did not express breastmilk antenatally, women who expressed breastmilk and stored it antenatally were more likely to had high score (60 +) but the difference was not statistically significant ($p>0.05$).

4.3.4 **Comparison of current feeding methods**

Breastfeeding methods, including exclusive breastfeeding and mixed feeding, were not significantly different between the group of women who performed AHE and the group who did not ($p > 0.05$; see Table 4.4).

Table 4.6: Current feeding methods of selected respondents

Age of infant	Feeding method	The expressed		The not expressed		Total	p-value
		n	%	n	%		
Younger than 1 month old	Exclusive breastfeeding*	22	88.0	17	73.9	39	0.21
	Mixed-feeding**	25	100.0	23	100	48	
	Total	25	100.0	23	100.0	48	
1 month to 3 months old	Exclusive breastfeeding	84	78.5	79	74.5	163	0.34
	Mixed-feeding	15	14.0	22	20.8	37	
	Non breastfeeding	8	7.5	5	4.7	13	
	Total	107	100.0	106	100.0	213	
4 months to 6 months old	Exclusive breastfeeding	56	46.3	61	42.7	117	0.80
	Mixed-feeding	56	46.3	72	50.3	128	
	Non breastfeeding	9	7.4	10	7.0	19	
	Total	121	100.0	143	100.0	264	
Overall	Exclusive breastfeeding	162	64.0	157	57.7	319	0.18
	Mixed-feeding	74	29.2	100	36.8	174	
	Non breastfeeding	17	6.7	15	5.5	32	
	Total	253	100.0	272	100.0	525	

*Exclusive breastfeeding: Breastmilk (including expressed milk or that from a wet nurse), oral rehydration salt, drops and syrups (vitamin, minerals, medication) are accepted (WHO 2021). **Mixed feeding: The practice of giving breastmilk and any other liquid or food simultaneously (Women's Global Health and Human Rights 2010, p 422). **A combination of both breastfeeding and feeding with breastmilk substitutes (UNICEF & WHO 2018).

4.3.5 **Factors associated with breastfeeding practices**

4.3.5.1 'Any breastfeeding' after adjustments

'Any breastfeeding' in both groups was compared after the demographics and clinical characteristics were adjusted (see Table 4.5).

Table 4.7: AHE and 'any breastfeeding'* after adjusting for demographics and clinical characteristics

Factor	Value	Woman	OR	95%CI		Sig.
AHE	AHE	253	1.00	0.59	2.79	0.54
	Non-AHE	271	1.28			
Occupation	Professorial (health)	105	1.00			0.65
	Professional (non-health)	154	0.62	0.18	2.12	0.44
	Office worker	219	0.66	0.19	2.26	0.50
	Housewife	33	2.18	0.20	23.98	0.53
	Others	13	0.36	0.05	2.79	0.33
Maternal education level	High school and below	48	1.00			0.21
	Professional training	95	0.48	0.12	1.96	0.31
	University (Undergraduate)	192	1.20	0.26	5.42	0.82
	University (Postgraduate)	189	1.24	0.25	6.22	0.79
Number of children	Ist child	306	1.00			0.36
	2nd child	172	1.95	0.77	4.95	0.16
	3rd child or more	46	1.37	0.36	5.22	0.64
Marital status	Married	462	1.00			0.77
	Unmarried	62	1.20	0.37	3.88	
Smoking during pregnancy	No	515	1.00			0.18
	Yes	9	0.29	0.047	1.79	
Gestational age	<=36weeks	33	1.00			0.43
	37weeks and over	491	0.43	0.05	3.52	
Employment	Employed	431	1.00			0.11
	Unemployed	93	0.47	0.19	1.18	
Country of birth	Born in other country	77	1.00			0.38
	Born in Australian	447	0.57	0.16	2.01	
Yearly family income	$60,000 and less	38	1.00			0.56
	Greater than $60,000	486	1.43	0.42	4.88	
Alcohol during regnancy	No	494	1.00			0.36
	Yes	30	0.52	0.13	2.11	
Maternal age	<30	150	1.00			0.65
	30+	374	1.21	0.53	2.77	

*Any breastfeeding: The infant is receiving some breastmilk (NHMRC 2012b), including exclusive breastfeeding.
Note. AHE = antenatal hand expression.

After adjusting the data for the factors in Table 4.5, the 'any breastfeeding' rates were not significantly different from one group to the other (OR = 1.28, 95% *CI* [0.59–2.79], p = 0.54). These results were consistent with those in Table 4.5. Notably, women who smoked cigarettes during pregnancy were less likely to breastfeed their infants than women who did not smoke cigarettes while pregnant (OR = 0.29, 95% *CI* [0.05–1.79],

p = 0.18); however, the difference was not statistically significant. Additionally, occupation did not significantly affect ‘any breastfeeding’ after adjusting other factors.

4.3.5.2 ‘Exclusive breastfeeding’ after adjustments

‘Exclusive breastfeeding’ was compared between the two groups after the demographics and clinical characteristics were adjusted (see Table 4.6

Table 4.6: AHE and 'exclusive breastfeeding' after adjusting for demographics and clinical characteristics

Factor	Value	Women	OR	95%CI		Sig.
AHE	AHE	253	1.00			0.30
	Non-AHE	271	0.82	0.56	1.19	
Occupation	Professorial (health)	105	1.00			
	Professional (non-health)	154	0.92	0.55	1.56	0.76
	Office worker	219	0.91	0.53	1.55	0.71
	Housewife	33	2.57	0.95	6.97	0.06
	Others	13	1.47	0.40	5.38	0.56
Maternal education level	High school and below	48	1.00			
	Professional training(e.g:TAFE)	95	0.66	0.30	1.46	0.31
	University (Undergraduate)	192	0.62	0.28	1.34	0.22
	University (Postgraduate)	189	0.60	0.26	1.34	0.21
Number of child	1st child	306	1.00			
	2nd child	172	1.26	0.84	1.89	0.27
	3rd child or more	46	2.92	1.33	6.39	0.01
Marital status	Married	462	1.00			0.34
	Unmarried	62	0.75	0.42	1.36	
Smoking during pregnancy	No	515	1.00			0.74
	Yes	9	0.79	0.19	3.29	
Gestational age	<=36weeks	33	1.00			0.29
	37weeks and over	491	1.50	0.71	3.17	
Employment	Employed	431	1.00			0.00
	Unemployed	93	0.36	0.21	0.61	
Country of birth	Born in other country	77	1.00			0.21
	Born in Australia	447	0.71	0.41	1.21	
Yearly family income	$60,000 and less	38	1.00			0.23
	Greater than $60,000	486	1.57	0.76	3.28	
Alcohol during pregnancy	No	494	1.00			0.97
	Yes	30	1.02	0.46	2.27	
Maternal age	<30	150	1.00			0.61
	30+	374	0.90	0.58	1.38	

Note. AHE = antenatal hand expression.

The results showed that there was no significant relationship between AHE and exclusive breastfeeding after adjusting the factors in Table 4.6 (OR = 0.82, 95 % *CI* [0.56–1.19], p = 0.30). Working women were more likely to breastfeed their infants exclusively than unemployed women (OR = 0.21, 95% *CI* [0.21–0.61], p = 0.000). Women who had three or more children were more likely to breastfeed their infants exclusively than new mothers (OR = 2.92, 95 % *CI* [1.33–6.39], p = 0.01).

4.4 **Summary**

The quantitative component of this research focused on discovering whether women who expressed breastmilk antenatally were more likely to have a high level of maternal breastfeeding self-efficacy and to exclusively breastfeed their infants. The results demonstrated that AHE itself did not significantly increase maternal breastfeeding self-efficacy. AHE did not significantly affect either 'any breastfeeding' or 'exclusive breastfeeding' after the data were adjusted for demographics and clinical characteristics. However, women who had expressed breastmilk and stored it antenatally appear to have enhanced their postnatal breastfeeding self-efficacy.

CHAPTER 5: **WOMEN'S EXPERIENCES OF AHE AND ITS INFLUENCE ON INFANT FEEDING METHODS**

5.1 **Introduction**

Over the past 15 years, there has been a resurgence of AHE, particularly for women who have diabetes during pregnancy (Walker 2017). This practice is being promoted to enable these women to avoid formula supplementation for their newborns (Chapman, Pincombe & Harris 2013; Forster et al. 2017; Walker 2017). Considering that Forster et al. (2017) have demonstrated the safety and benefits of AHE, for a specific at risk population only evidence remains lacking on the safety and benefits for low risk populations (Wszolek 2015). Further research may demonstrate the potential for the widespread use of AHE by all pregnancy women. Notably, AHE is advantageous not only for women who have diabetes during pregnancy but also for all women who wish to breastfeed their infants. This is because AHE has been shown to potentially improve breastfeeding outcomes, including increasing women's confidence with breastfeeding, enabling them to gain familiarity with their breasts (ABA 2017; Cox 2006, 2010; Wszolek 2015) and assisting to establish full lactation more quickly (Lamba, Chopra & Negi 2016; Singh, Chouhan & Sidhu 2009).

This study had two qualitative objectives for exploring the effect of AHE on maternal breastfeeding self-efficacy and they were:

1. the effect of AHE on maternal breastfeeding self-efficacy.
2. maternal experiences of AHE and how it affects infant feeding practice.

In accordance with this study's aim, this chapter reports women's experiences of AHE of breastmilk using their qualitative responses to the survey questions to identify positive and negative influences on maternal breastfeeding self-efficacy and their feeding practice.

5.2 **Data analysis**

A total of 253 women reported that they performed AHE; of those women, 238 responded to the qualitative Question 28 (i.e., 'Describe your antenatal experiences of hand expressing and storing breastmilk.') and/or Question 29 (i.e., 'How did AHE influence your choice of infant feeding method?'). The women's responses to these two questions were combined for the data analysis due to their similarity and overlaps. Using Template Analysis; a group of techniques for thematically organising and analysing textual data (King 2004), and it is a flexible technique that has specified procedures when using an a priori template to code the data (King 2004); two main themes and six subthemes were identified (see Table 5.2).

5.3 **Findings**

The majority of women in this survey were born in Australia (n = 212: 89.1%), over 30 years old (n = 160: 67.2%), employed (n = 201: 84.5%) and university graduate (n = 175: 73.6%). Table 5.1 presents the demographics of the women who responded to these questions.

Table 5.1: Demographics of women who responded to the Questions 28 and 29

Variable	Value	Number	%
Maternal age	<30 yrs	78	32.8
	30+ yrs	160	67.2
	Total	238	100.0
Country of birth	Non Australian	26	10.9
	Australian	212	89.1
	Total	238	100.0
Marital status	Married	207	87.0
	Unmarried	31	13.0
	Total	238	100.0
Number of child	First child	137	57.6
	2nd child	75	31.5
	3rd child or more	26	10.9
	Total	238	100.0
Employment	Employed	201	84.5
	Not employed	37	15.5
	Total	238	100.0
Maternal education	High school and below	21	8.8
	Professional training (e.g. TAFE)	42	17.6
	University (Undergraduate)	88	37.0
	University (Postgraduate)	87	36.6
	Total	238	100.0
Family income	$60,000 and less	22	9.2
	Greater than $60,000	216	90.8
	Total	238	100.0
Occupation	Health professionals	58	24.4
	Non health professionals	78	32.8
	office work	80	33.6
	Housewife	15	6.3
	Others	7	2.9
	Total	238	100.0
Method of birth	Vaginal birth	153	64.3
	Caesarean	85	35.7
	Total	238	100.0
Age of child	Younger than 1 month old	24	10.1
	1 month to 3 months old	101	42.4
	4 months to 6 months old	113	47.5
	Total	238	100.0

The first main theme was ‘confidence in my body and developing self-efficacy’, which included the following four subthemes: ‘gaining mastery and confidence’ (mastery experience), ‘sense of security’ (mastery experience), ‘avoiding formula’ (mastery experience) and social persuasion and encouragement (social persuasion and vicarious experience). The second main theme was ‘lack of confidence or self-efficacy’, which included the following three subthemes: ‘challenges’ (mastery experience, social persuasion, and physiological and affective states), ‘insufficient support from health professionals’ and ‘physiological and affective states and pain’ (social persuasion and physiological and affective states).

Table 5.2: Women’s experiences of AHE and its influence on infant feeding methods

Main Theme	Subthemes
• Confidence in my body and developing self-efficacy	• Gaining mastery and confidence • Sense of security • Avoiding formula (risk groups with breastfeeding) • Social persuasion and encouragement
• Lack of confidence or self-efficacy	• Challenges • Insufficient support from health professionals • Physiological and affective states and pain

5.3.1 **Confidence in my body and developing self-efficacy**

The first theme is women’s confidence in their own bodies regarding breastfeeding after performing AHE, which created a sense of maternal self-efficacy. Notably, the women

directly attributed AHE to their increased confidence. Of the 238 women who responded to the qualitative questions, 147 (61.8 %) women included positive comments regarding their experiences of AHE. Of those who had a positive response, 124 (84 %) women were performed AHE and also stored their breastmilk antenatally. Women who had successfully expressed and stored breastmilk antenatally were likely to develop a sense of security, which contributed to their confidence with breastfeeding in the postpartum period. Women with complications during pregnancy who had expressed breastmilk to avoid formula supplementation also experienced an increase in their maternal breastfeeding confidence. Additionally, receiving adequate encouragement and support from peers or health professionals increased women's confidence and competence while mastering AHE skills.

5.3.1.1 Gaining mastery and confidence

Women most frequently reported that gaining mastery through their experiences of AHE improved their confidence with breastfeeding. Mastering the technique of AHE and being able to express an adequate amount of breastmilk increased their confidence with breastfeeding. One mother described that her developing confidence was a result of using AHE:

> *I had quite a lot of leaking of colostrum and was able to store quite a lot, which made me feel as though I would have a substantial supply.* (ID 86)

Woman 86 spoke confidently about the outcome of AHE, observing that she had 'a lot of leaking of colostrum', and her increased confidence in her body's ability to produce breastmilk occurred through knowing that she would have 'a substantial supply'. Increased confidence as an outcome of AHE was reinforced by several women:

Having expressed colostrum antenatally, I felt much [more] confident about my ability to breastfeed and [the] capacity of my breasts to produce milk. (ID 340)

[AHE] was good, [it] gave me confidence [that] my body was doing what it was meant to do. (ID 512)

Notably, the women's reference to their body's ability to produce milk and the acknowledgement that their breasts or body had the capacity to function as they should was a common theme in the data:

[AHE] made me feel confident [that] I could produce an adequate supply plus give baby extra colostrum if [or] when needed. (ID 554)

Additionally, Woman 173 described the progress that she made with AHE in more detail:

There was a slow start. The first day yielded nothing. The second day yielded moist nipples (impossible to collect any). On the third and fourth days, I had microdroplets that were impossible to store. On the fifth day, I had 0.1 mL in total in a syringe over the course of a day. I persevered and gained confidence and quantity after that. (ID 173)

After this initial progress, Woman 173's confidence and the amount of breastmilk that she had been able to express increased. Her use of the word 'persevered' indicated that AHE was not always an easy task; however, her perseverance with AHE produced desired results. This reflected the woman's acknowledgement of gaining mastery.

5.3.1.2 Sense of security

The subtheme of security related to having breastmilk readily available at birth; having a sense of security enabled some women to develop feelings of skill mastery. Having breastmilk readily available for their infants provided women with the option of alternative feeding methods if needed:

> *[I] expressed 15 mL of colostrum from 36 weeks and stored it to supplement baby after birth not knowing if I would be successful at breastfeeding.* (ID 92)

Woman 92 had stored colostrum ready for the first days following birth. The small amount of breastmilk (i.e., 15 mL) that she had stored was identified as a safety measure in case her supply of breastmilk was inadequate. Another woman identified that having expressed breastmilk antenatally served as an emotional support during the early postpartum period:

> *I felt more satisfied hand expressing with my second baby, mentally it helped me get through the trouble I had feeding my child. (ID 620)*

Antenatal hand expression (AHE) contributed to mentally supporting Woman 620 through the initial difficulties she experienced when trying to breastfeed her baby. Additionally, Woman 272 described that having a store of EBM reduced the risk of her needing to provide formula supplementation in an unforeseen circumstance:

> *I antenatally expressed to have some EBM if my baby ended up in the nursery to avoid formula feeding.* (ID 272)

Many women identified that AHE improved their ability to produce enough milk either to use as a supplemental feeding method if needed or to reduce the risk of having to provide formula in unforeseen circumstances in the days immediately following birth.

5.3.1.3 Avoiding formula

Women with diabetes during pregnancy have been encouraged to perform AHE (Forster et al. 2017). The main purpose of this practice is to avoid using formula as a supplemental feeding method for their newborns. Women with other complications (e.g., giving birth via caesarean section or having breast hypoplasia) have also begun using AHE (Cox 2010; ISLHD 2014). Demonstrably, women who responded to this survey reported that they had performed AHE due to giving birth via caesarean section or having low amniotic fluid index (AFI) or cholestasis. Women with complications during pregnancy can anticipate that these issues may affect their infant's health or their own ability to breastfeed in the early postpartum period. For these women, AHE may not only enable them to avoid formula supplementation but also support them to improve their confidence as they are actively contributing to the health of their infants. Some respondents who had diabetes during pregnancy voluntarily performed AHE to avoid formula supplementation and to provide colostrum for their infants to give them the best possible start in life:

> *[I had] GD [gestational diabetes] so [I] wanted a stock pile in case [the baby] needed to spend time in special care unit.* (ID 85)
>
> *I am a type 1 diabetic and so wanted to ensure my baby could have colostrum available in the event of low blood sugars in the period immediately after birth.* (ID 489)

Women with health issues other than diabetes during their pregnancy also performed AHE. Woman 137 had anticipated that her condition might affect not only her baby's health but also her breastfeeding practices:

> *Baby was taken early due to low AFI was [it] recommended that I have extra colostrum stored in case of health issues.* (ID137)

Woman 309, who also had health issues, described having had a positive experience with AHE:

> *I expressed before my baby was born because I had cholestasis and [knew] I would be induced at 37 weeks. I hand expressed for three months prior to delivery on and off and had 30+ mL in the freezer. I was so lucky I did, as my frozen milk was what we used for the first few days in NICU [neonatal intensive care unit] while I got my supply up.* (ID 309)

Woman 309 recognised how fortunate she was to have had expressed antenatally. Having had cholestasis during pregnancy, she acknowledged that AHE contributed to her ability to feed her infant, which enabled her to develop confidence in her ability to breastfeed. Of note is the woman's statement that she commenced AHE at 25 weeks of gestation which is extremely early and may have compromised her pregnancy.

5.3.1.4 Social persuasion and encouragement

Having health professionals and peers support AHE may enhance maternal breastfeeding self-efficacy. The value of AHE was reinforced when women received encouraging messages from their peers. In particular, women were more likely to readily accept AHE advice when it originated from peers who had experienced

unexpected circumstances after the birth of their infants because the advice was linked to real-life events. Demonstrably, Woman 6 described that receiving encouraging information from her peers regarding AHE increased her motivation to continue with the practice:

> *I knew I wanted to do it because some friends recommended it as an insurance policy in case … an emergency c-section meant I couldn't breastfeed [my baby] immediately. (ID 6)*

Woman 6 considered expressing antenatally an 'insurance policy' because the stored breastmilk may never be used. AHE was an activity that protected her infant if she had had to have an emergency caesarean section, which may have compromised her ability to breastfeed.

Health professionals' effective persuasion and encouragement can also alter women's attitudes and enhance their determination to store breastmilk. Woman 156 noted that the support she had received from health professionals about learning how to hand express breastmilk enhanced her confidence:

> *I [hand expressed antenatally] with my first and stored it. We didn't use it but the sessions were very helpful to learn how to hand express.* (ID 156)

Another woman commented that learning how to hand express required trial and error:

> *[It] was trial and error. I had a one-on-one demonstration from a lactation specialist, which really aided in my technique and confidence. I was able to express 8 mL of colostrum before my son's birth.* (ID 388)

Woman 388 identified that having received assistance from an LC to gain the necessary skills in AHE significantly improved her ability to hand express.

5.3.2 **Lack of confidence**

Of the 238 women who responded to the qualitative questions, 91(38.2%) women had a negative experience of AHE and of those who had a negative response, 51 (56%) women were performed AHE but did not store their breastmilk antenatally.

Contrary to the previous theme, some women did not gain confidence from performing AHE, which had the potential to negatively affect maternal self-efficacy. AHE can be a demoralising experience for some women who struggle to successfully express and store breastmilk for later use. The inability to hand express breastmilk due to experiencing either challenges with AHE techniques or pain during the AHE practice may decrease women's sense of breastfeeding self-efficacy. Notably, having health professionals provide insufficient emotional and technical support hindered mastering AHE skills and decreased maternal self-efficacy.

5.3.2.1 Challenges

The second most frequently reported response regarding women's AHE experience related to the challenges of hand expressing. Expressing was quite challenging for many women due to the difficulty they encountered when learning AHE skills. Many women reported that they could only collect a few drops of colostrum and that they expended a great deal of effort for a minimal positive outcome.

> *[It] was hard to hand express. [I] felt [I] never could get the technique right.* (ID 100)

[I] expressed and stored [colostrum]. I found it quite difficult to hand express. It really hurt my wrist—maybe I wasn't doing it right—and I couldn't seem to get much out. (ID 131)

Women 100 and 131 accepted blame for the difficulties they experienced with AHE, acknowledging the possibility of them having not mastered the technique. Another woman revealed the challenges she experienced with hand expressing and the effort she exerted to persevere:

Hand expressing was hard! Having to use both hands to support and 'pump' the breast meant my partner had to 'catch' drops with the syringe. It was slow and at first volume was dismal. Volume improved slightly, but it was a slow and messy task. It did, however, demystify the mechanics of breastfeeding that you don't see otherwise. (ID 221)

For Woman 221, AHE required an additional person to catch the drops of colostrum, and she described the process as 'a slow and messy task'. However, she acknowledged that learning how to hand express had improved her understanding of the 'mechanics of breastfeeding'. Woman 248 commented that she had found recorded visual demonstrations useful. These visual demonstrations could be regarded as a form of vicarious experience. However, even with this assistance, she still found hand expression difficult to master:

It was really difficult to do. I watched some great videos sent to me by my brother's gf [girlfriend] who is a midwife but it was still very difficult. I leaked a lot from about 22 weeks so I thought it [would] be easy but [the] most I'd get is a couple of drops. (ID 248)

It appears that she had expected AHE to have been easier as she had started to leak milk from 22 weeks gestations. This suggested that more one-on-one support may have been required to provide information and to assess her hand expressing technique.

5.3.2.2 Insufficient support from health professionals

Some women who had considered AHE a challenging experience also stated that they had struggled to accomplish the task due to not having received adequate technical or emotional support from health professionals:

> *I had no idea what I was doing. [My doctor told me] to express the colostrum into a syringe and freeze it … but [I] wasn't able to successfully do it after trying numerous times.* (ID 101)

Being told simply 'to express' was insufficient instruction for Woman 101

Conversely, several women reported that they had struggled to hand express even after health professionals had provided them with information and support:

> *I found this an awkward and difficult process … The pamphlet [I] received from the hospital was difficult to practically implement, so I ended up watching a YouTube video.* (ID 363)
>
> *Hand expressing was very difficult and essentially unsuccessful. I had to rely on YouTube videos and online info [information] as no one showed me how to do it properly in the hospital.* (ID 368)

A common theme was the lack of a physical demonstration of how to express. Notably, a lack of information can mean that mothers are not afforded the ability to choose to perform AHE:

> *I had been seeing a doctor for my prenatal check-ups as I had gestational diabetes. It was by chance that one day the appointments were running late and a midwife I knew began my check for me and asked if I'd thought of expressing due to the gestational diabetes. This was the first I had heard that it was recommended and the midwife showed me how to and gave me some syringes to collect it. I feel if I had never seen the midwife, the doctor would not have suggested prenatal expression.* (ID 27)

Woman 27's comment demonstrated that, without her serendipitous meeting with the midwife, she may not have known about the value of AHE and that women with gestational diabetes (GD) were advised to practice this. Although AHE *is* being promoted as a beneficial activity for women with GD, health professionals do not always pass on this information.

Further, some women indicated that a hands-on instructional approach does not always occur:

> *My midwife, days before my baby arrived, showed me how to self-express colostrum with the model breast. I wasn't comfortable doing it and didn't really … understand how to so never did.* (ID 216)

Woman 216 did not explain whether she was physically or emotionally uncomfortable when hand expressing. However, this did highlight the need for health professionals to understand that some women will find touching their breasts emotionally difficult, perhaps due to traumatic events such as sexual abuse. This can often be an unknown aspect of the woman's history requiring all interactions to be respectful and sensitive to the possibly of these traumatic experiences.

Poor communication can add to women's negative experiences of AHE:

> *Made me feel crap. Made hospital staff doubt I'd have milk or be able to feed my baby even [though] I successfully breastfed for 18 months previously … [I] know hand expressing does [expletive] all for me, even if I'm engorged. So not a happy or positive experience.* (ID 10)

Woman 10 indicated that not only a lack of comprehensive observation and emotional and responsive support but also poor communication skills resulted in her negative experience. Although the woman had successfully breastfed, her midwives did not consider her knowledge of her own body. Fortunately, the woman's previous mastery experience allowed her to believe in her ability to breastfeed her infant, who was 4–6 months old and breastfeeding successfully at the time of the survey. For some women, having midwives providing negative feedback that demonstrates a lack of confidence in the woman's ability to hand express could negatively affect maternal breastfeeding self-efficacy; quality support could have changed these women's experiences of AHE.

5.3.2.3 Physiological affective states and pain

For some women, AHE was a daunting experience because it was uncomfortable, awkward and painful:

> *Painful, long process without much result.* (ID 122)
>
> *Painful and uncomfortable.* (ID 372)
>
> *Uncomfortable and awkward.* (ID 450)
>
> *Very difficult and painful.* (ID 528)

Another woman described her experience as 'very demoralising':

> *I really struggled and never got very much [colostrum] out. I found it very demoralising as I had gestational diabetes and was desperate for my baby not to need formula top ups.* (ID 205)

Although Woman 205 was highly motivated by her need to have a supply of expressed milk to avoid 'formula top ups', AHE did not meet her expectations.

5.4 **Summary**

This chapter explored women's experiences of AHE, which were mainly related to the theme of maternal breastfeeding self-efficacy (both the positive and negative effects). The positive outcome of AHE that women most frequently reported was gaining mastery and confidence with breastfeeding. Therefore, mastering AHE techniques has the potential to boost women's breastfeeding confidence and self-efficacy. Respondents also considered performing AHE not only an emotional safety net that reduced their stress levels but also a concrete act that minimised the need for supplemental formula feeding. AHE can positively affect the self-efficacy of women who might experience complications during pregnancy or who anticipate experiencing breastfeeding challenges in the early postpartum period. Having peers and health professionals provide encouragement and support will likely prompt women to consider and commence the practice of AHE.

Conversely, many women reported that AHE was a challenging task and could be not only demoralising due to pain or their lack of skill but also uncomfortable and awkward. These negative experiences resulted in women feeling as if AHE had not met their expectations and had potentially reduced their ability to develop maternal breastfeeding self-efficacy. Inadequate and fragmented health care hinders women's skills mastery

and motivation to perform AHE; therefore, sufficient and continual ongoing technical and emotional support is a major factor when assisting women to perform AHE successfully. This support must also include reassuring women who cannot express breastmilk during the antenatal period that this does not indicate that they will fail to breastfeed their infant.

CHAPTER 6: **WOMEN'S PERCEPTIONS OF DESIRED BREASTFEEDING EDUCATION AND SUPPORT IN THE ANTENATAL AND POSTNATAL PERIODS**

6.1 **Introduction**

The act of hand expressing can be a significant maternal self-efficacy intervention during pregnancy. However, women reported some potential negative effects of AHE, including that learning and sustaining the practice had been challenging, that they had not received sufficient support from health professionals and that they had experienced pain during the process. These experiences highlighted that health professionals, family members and peers need to provide women with adequate and continuous support regarding AHE's emotional and technical aspects.

The survey used in this study gave women an opportunity to share their feedback regarding components of breastfeeding education and support. For example, the third survey question was as follows: 'In thinking back about the type of breastfeeding education you received, what additional information would you have liked to receive (antenatally or postnatally)?'

It has been well documented that contemporary antenatal breastfeeding education and postnatal breastfeeding support enhance breastfeeding outcomes, including breastfeeding initiation and duration (Willumsen 2013); however, Australia struggles to increase the prolonged breastfeeding of infants (Australian Institute of Health and Welfare 2010). Demonstrably, the 2010 Australian National Infant Feeding Survey

(ANIFS[††]) results indicated that the country's rate of exclusive breastfeeding at five months is 15.4% (AIHW 2010). This is well below the exclusive breastfeeding rate that the WHO recommended for the first six months after birth (i.e., at least 50%; WHO 2017a).

This chapter not only explores women's perceptions of desired breastfeeding education but also discusses the significance and issues of educating women about breastmilk expression—including AHE—as a part of antenatal breastfeeding education programs.

6.2 **Data analysis**

A total of 403 women responded to Question 24, including women who did and did not express antenatally. Of these responses, 12 were excluded as they were not pertinent.[‡‡] Therefore, a total of 391 responses were used for the data analysis (see Table 6.1) Using Template Analysis to analyse the women's perceptions of desired breastfeeding education and support, two main themes were identified (see Table 6.2).

6.3 **Findings**

The majority of the women in this survey were born in Australia (n= 332: 84.9%), over 30 years old (n = 282: 72.4%), employed (n = 324: 82.9%) and university graduate (n = 301: 77.0%).

[††]After extensive research, this survey was found to be the most recent on this topic.

[‡‡] Answers provided were 'N/A', 'nil' or 'no'.

Table 6.1: Demographics of women who responded to Question 24

Variable	Value	Mother	%
Maternal age	<30	108	27.6
	30+	283	72.4
Total		391	100.0
Country of birth	Born in another country	59	15.1
	Australian	332	84.9
	Total	391	100.0
Marital status	Married	343	87.7
	Unmarried	48	12.3
	Total	391	100.0
Number of children	First child	234	59.8
	2nd child	125	32.0
	3rd child or more	32	8.2
	Total	391	100.0
Employment	Employed	324	82.9
	Not employed	67	17.1
	Total	391	100.0
Maternal education level	High school and below	31	7.9
	Professional training (e.g: TAFE)	59	15.1
	University (Undergraduate)	156	39.9
	University (Postgraduate)	145	37.1
	Total	391	100.0
Family income past 12 months	$60,000 and less	32	8.2
	Greater than$60,000	359	91.8
	Total	391	100.0
Occupation	Health professorial	83	21.2
	Non health professional	114	29.2
	Office work	162	41.4
	Housewife	22	5.6
	Others	10	2.6
	Total	391	100.0
Method of birth	Vaginal birth	249	63.7
	Caesarean	142	36.3
	Total	391	100.0
Current age of child	Younger than 1 month old	37	9.5
	1 month to 3 months old	157	40.2
	4 months to 6 months old	197	50.4
	Total	391	100.0

6.3.1 **Women's responses to desired breastfeeding education or support**

The first main theme was 'Various types of assistance to develop maternal breastfeeding self-efficacy' and included the following three subthemes: 'individualised one-on-one support' (social persuasion), 'assistance with expressing breastmilk or AHE' (mastery experience and social persuasion) and 'provision of coping strategies and emotional support to increase confidence during pregnancy' (mastery experience, social persuasion and physiological affective states). The second main theme was 'Various types of information to develop maternal breastfeeding self-efficacy' and included the following five subthemes: 'more general breastfeeding information' (social persuasion), 'a specific breastfeeding class' (mastery experience and social persuasion), 'follow-up guidance and information' (social persuasion), 'information for special needs and troubleshooting' (mastery experience and social persuasion) and 'information consistency' (social persuasion and physiological and affective states). As in the Chapter 5 the identification of vicarious experiences were minimally reported by the women in their responses to Question 24.

Table 6.2: Women's perceptions of desired breastfeeding education

Main Themes	Subthemes
• Various types of assistance to develop maternal breastfeeding self-efficacy	• Individualised one-on-one support • Assistance with expressing breastmilk or AHE • Provision of coping strategies and emotional support to increase confidence during pregnancy
• Various types of information to develop maternal breastfeeding self-efficacy	• More general breastfeeding information • A specific breastfeeding class • Follow-up guidance and information • Information for special needs and troubleshooting • Information consistency

Note. AHE = antenatal hand expression.

The majority of the women's responses highlighted that the assistance and information that had been provided to them had not sufficiently addressed their needs. However, health professionals may identify that they *are* providing adequate breastfeeding assistance and information and exerting maximum effort by offering individualised one-on-one support. Evidently, significant incongruities exist between health professionals' and women's perceptions of breastfeeding education and support. The gap between women's expectations and the reality of maternity services may be a frustrating and disappointing experience for some mothers; a lack of support could have potentially slowed the development of their breastfeeding skills and confidence. In particular, some women's responses highlighted the significance of having a specific breastfeeding class or an education class provided by ABA volunteers. Respondents also noted the importance of receiving consistent and adequate information, because information inconsistency negatively affects women's development of not only th

eir confidence with breastfeeding but also their relationship with their health professionals.

Of the women who responded to the survey, one in ten specifically commented on the importance of breastmilk expression—including AHE—and its education. Their statements implied that accomplishing the technique of expressing breastmilk in both the antenatal and postnatal period was vital and was proposed to be an appropriate strategy with which to assist with increasing women's breastmilk supply and supporting their development of breastfeeding confidence. Demonstrably, some of the women who requested breastmilk expression education declared that health professionals should teach the practice of AHE to all women who intend to breastfeed. Further, almost 13% of the women who responded to Question 24 stated that antenatal breastfeeding education sessions should comprise strategic components that enhanced women's resilience and ability to deal with breastfeeding challenges. Additionally, they requested that additional information be provided and that strategies to resolve common breastfeeding troubles or special needs be demonstrated to assist women to develop breastfeeding knowledge and skills.

6.3.2 **Various types of assistance to develop maternal breastfeeding self-efficacy**

The women's responses to the first main theme (i.e., 'Various types of assistance to develop maternal breastfeeding self-efficacy') highlighted the importance of ongoing individualised assistance, knowing how to express breastmilk and receiving assistance that focused on coping strategies or emotional support.

6.3.2.1 Individualised one-on-one support

A significant number of women who responded to Question 24 had sought individualised support to develop their breastfeeding confidence, even if they considered the breastfeeding education that they participated in during pregnancy adequate. The majority of these women stated that the breastfeeding assistance or supervision during their postpartum hospital stay was limited for numerous reasons, including shortage of staff, staff lacking breastfeeding knowledge and inconsistent midwifery care. These comments confirmed the need for individualised, high-quality one-on-one support, including having easy access to an LC.

Woman 20 highlighted the importance of midwives not assuming that women who have had previously breastfed will not need breastfeeding support or education:

> *[There should be] more support in hospital, more patience with mothers, even including second-time mothers; take mothers' concerns seriously and really listen.* (ID 20)

The word 'patience' is significant as it suggests that midwives are too busy to spend any additional time with women who are trying to breastfeed. Critically, Woman 20 also mentioned the need to 'take mothers' concerns seriously and really listen'. This implied that she did not experience these things in her interactions with midwives.

Requiring more individualised one-on-one assistance was a common theme among responses:

> *More hands-on support and education with latching once baby was born.* (ID 53)

> *To have more support in the first few days from experts for hands-on experience (rather than remembering previous information).* (ID 147)

Woman 147's response indicated that she might have had difficulty remembering breastfeeding instructions when recovering from the physical exertion of labour and birth and that she had wanted 'more support in the first few days … for hands-on experience'. Interestingly, she used the term 'expert'; it is unclear from her comment whether she was referring to midwives or to LCs. If, in fact, she was referring to LCs, then midwives who work in postnatal wards should regain their role of supporting women learning to breastfeed and be able to work with them comprehensively to resolve most breastfeeding issues during the early postpartum period.

Having health professionals provide early intervention or support to not only first-time mothers but also mothers with children during both the antenatal period and postpartum hospital stay is likely to significantly influence the longevity of women's breastfeeding practices.

Woman 191 highlighted that the lack of support she received when she had her first child led to 'three months of difficulties' after being discharged from hospital. However, the quantitative data in this survey confirmed that she was successfully breastfeeding her second baby at the time of the survey, which she attributed to her initiative in seeking assistance:

> *Postnatal, I sought out a lot of assistance from the midwives to help get our breastfeeding established. I did not do this the first time and experienced three months of difficulties.* (ID 191)

Stating that she ‘sought out a lot of assistance’ implied that her actively seeking, rather than passively receiving help was what made her experience with breastfeeding her second baby more positive than that of her first.

Women 107 and 671 attributed their negative experiences in a hospital to a chronic staff shortage or large staff workloads. Woman 107 identified that she had needed more time for the midwives to ‘sit and observe [her] techniques and positioning’, considering the critical importance of the first few days after giving birth:

> *Postnatal breastfeeding supervision whilst in hospital is limited obviously due to workloads of the staff. It would be helpful if the midwives had more time to sit and observe techniques and positioning whilst [I was] breastfeeding in those first critical days.* (ID 107)

Additionally, Woman 671 proposed that ‘better one-on-one advice’ is needed and, if necessary, a longer hospital stay. She also described the lack of breastfeeding education made available while in hospital:

> *Better one-on-one advice, not being forced to leave hospital (public) before my milk came in. The only breastfeeding class the hospital offered while I was staying there was 8 hours after baby was born and I was too injured to attend. No replacement was offered.* (ID 671)

Accessing breastfeeding education classes depended on whether women were well enough to attend when the classes were being offered. This lack of availability makes one-on-one breastfeeding advice and support even more important to ensure this essential parenting skill is achieved prior to discharge.

Many women who articulated the importance of individualised one-on-one support also identified the benefits of having easy accessibility to an LC. Woman 447 yearned for routine LC assessments or education sessions before she was discharged from hospital regardless of whether she had had breastfeeding issues or not:

> *I would like to have received information directly from a lactation consultant postnatally during the hospital stay, within the first three days. I believe every first-time mother should be … taught about this.* (ID 447)

6.3.2.2 Assistance with expressing breastmilk or AHE

Of the women who responded to Question 24, one in ten requested education about breastmilk expression as part of breastfeeding education and assistance. Additionally, many women were willing to be taught how to express breastmilk by health professionals in both the antenatal and postnatal period. In particular, understanding breastmilk expression can not only potentially assist in reducing women's stress levels regarding their milk production but also improve their confidence with breastfeeding. Woman 280 revealed that she did not receive an adequate amount of education regarding breast expression and would have liked more of the following:

> *Practical training and support around hand expressing—showing you and practicing [sic] it on your own body before and after birth.* (ID 280)

Additionally, women who requested to be taught skills of breastmilk expression also stressed the significance of AHE. Woman 301 emphasised that AHE is not only beneficial for women in identified breastfeeding high-risk groups (with medical conditions, breastfeeding difficulties or breast surgery). Rather, she highlighted that *all*

women who wish to breastfeed their infants should be taught and encouraged to practise AHE:

> *The lactation consultant (whom I requested an appointment with) said I didn't need to antenatally express due to being low risk. I am so glad that I did anyway as there were serious complications with the birth. My midwife suggested that I express antenatally anyway. I think women should be taught and encouraged … to antenatally hand express regardless of their pregnancy risk factor.* (ID 301)

Demonstrably, Woman 650 lost an opportunity to provide extra breastmilk to support her infant:

> *I've since heard about expressing colostrum antenatally, which would have been helpful to know about. I had trouble at first with breastfeeding due to flat nipples so my baby lost quite a bit of weight, so having this [skill] would have been great.* (ID 650)

Woman 650 identified the relationship between unexpected breastfeeding problems, how this affects the infant and the value of having stored breastmilk available; saying that 'having [stored breastmilk] would have been great' reinforced her belief in the value of AHE.

6.3.2.3 Provision of coping strategies and emotional support to increase confidence during pregnancy

Many women believed that the contents of contemporary antenatal breastfeeding education were simplistic and superficial; some highlighted that there is a lack of

realistic information regarding the challenges associated with breastfeeding that many women experience and appropriate coping strategies. Considering the responses, it appeared that the women found that gaining the competence to breastfeed was difficult, especially regarding this lack of information:

> *Some real information about the difficulties over just the importance [of breastfeeding]*. (ID 35)
>
> *How hard it is, doesn't just come naturally or you don't just put the baby on and it happens.* (ID 85)
>
> *Antenatally, it wasn't really explained how hard it is and how long it takes for babies and mums to learn. I am still struggling with latching three weeks in.* (ID 275)

Although these comments from Women 35, 85 and 275 did not provide clear details of the breastfeeding difficulties or stress factors that they experienced, they indicated that breastfeeding was much harder than they had anticipated. In particular, Woman 275 was left feeling unprepared to cope with breastfeeding difficulties for three weeks in the postpartum period because she had not received adequate information regarding initiating breastfeeding.

Women 416 and 672 emphasised that even if women knew the importance of breastfeeding and had some technical knowledge regarding the mechanics of it, they would still find support beneficial. In particular, including strategic components in antenatal breastfeeding education would be especially helpful; these could include where to access community support and when to seek interventions to enhance breastfeeding attempts or resolve breastfeeding difficulties.

> *I would like to have known the challenges many women face and how to overcome them. [For example,] I felt I had issues with my milk supply and my baby wasn't getting enough milk. I feel like these sorts of issues are genuine and I would have liked to have been prepared for how to cope with the challenge. Also, I would have liked to have been aware of how difficult breastfeeding can be for some people. I found the experience physically painful (I had very sore nipples from constant feeding) and psychological challenging—the cluster feeding and lack of sleep. If I had been more prepared for these [challenges,] I think I may have persevered with exclusive breastfeeding for longer.* (ID 416)

Woman 416 struggled with not only her feeling of being unprepared but also her uninformed expectation of the physiological and psychological challenges of breastfeeding; ultimately, these challenges led to her ceasing exclusively breastfeeding her infant more quickly (at six weeks) than she would have wanted. The challenges that Woman 416 experienced included physical pain, 'cluster feeding' and a 'lack of sleep'. Although these can be common issues, new mothers require careful assistance during the antenatal and early postnatal period to prepare them for the sometimes complex emotional experiences and physical demands of breastfeeding.

Additionally, Woman 672 also highlighted that the breastfeeding classes she attended did not provide realistic information regarding the challenges that can be associated with breastfeeding:

> *Breastfeeding could be difficult and it is not uncommon for many women. All the barriers and difficulties you will face breastfeeding.* (ID 672)

It is critical that women understand breastfeeding issues not only to enable them to these problems realistically but also to assist them to problem-solve and to know when and from where to seek assistance. Woman 672 also identified that the classes she had attended were superficial; they provided neither a rationale for why it is important for women to be aware of breastfeeding barriers nor the depth of information needed to avoid or manage these issues:

> *… so you are aware and can seek help asap. All the classes I attended just spoke about the benefits of breastfeeding and did a quick model of good attachment but did not discuss common barriers—thrush, tongue-tie, clicking sound.* (ID 672)

Often, women can be motivated simply by the advice of peers who have had similar experiences. Demonstrably, Women 163 and 660 stated that the accomplishments of their peers who had had similar experiences became a strong motivator for them in developing breastfeeding confidence. These women also emphasised that providing information or support regarding developing breastfeeding coping strategies was needed during the antenatal period. In particular, Woman 163 suggested that breastfeeding support groups should be offered within women's communities but that they must begin in the antenatal period:

> *Maybe more like a bf [breastfeeding] support group, like [a] mothers group at the early childhood clinic. But must be antenatally.* (ID 163)

Woman 660's recommendation was to invite experienced mothers to a breastfeeding support group to share their experiences with new mothers:

Antenatally: have other recent mums talk about [their] breastfeeding experience rather than health professionals. (ID 660)

Seeing the success of their peers after a sustained effort could potentially encourage women to believe that it is possible that they can also master the technique.

6.3.3 **Various types of information to develop maternal breastfeeding self-efficacy**

This second main theme was 'Various types of information to develop maternal breastfeeding self-efficacy'. The women's responses highlighted a lack of adequate fundamental breastfeeding information and issues concerning the modality of contemporary breastfeeding education.

6.3.3.1 More general breastfeeding information

A quarter of the women who responded to Question 24 identified that midwives or other health professionals need to provide more fundamental breastfeeding information during pregnancy or in the early postpartum period.

6.3.3.1.1 Infant's behaviour and normal feeding patterns in early postpartum

The topic of general breastfeeding information that women most frequently requested was about their baby's behaviour and normal feeding patterns during the early postpartum period. This is arguably the most important and most fundamental information that all women should receive during pregnancy.

Woman 10 indicated that the levels and content of breastfeeding education varied among hospitals. She highlighted that breastfeeding information regarding lactogenesis II, demand feeding and hunger cues should be compulsory information that is provided to all women during the antenatal period:

> *How babies help your milk come in. The importance of feeding on demand at first hunger cues. What hunger cues actually are.* (ID 10)

Woman 268 supported this:

> *[the need] for greater information on how frequently newborns need to feed.* (ID 268)

The need for more comprehensive, basic information regarding lactogenesis, how frequently to breastfeed a newborn, feeding on demand and feeding cues is knowledge that all women who intend to breastfeed should be taught during pregnancy. Further, Woman 583 commented that breastfeeding education should be more advanced:

> *I feel like it all needs to be bettered, a booklet with photos does not help at all. It would be amazing to have better classes.* (ID 583)

From her experience, simply being shown 'a booklet with photos' did not provide Woman 583 with adequate information or skills development to assist in her developing breastfeeding knowledge and skills. Although she did not provide further details of what would have constituted 'better classes', her comment implied that the breastfeeding class that she had attended was superficial and of no value to her.

6.3.3.1.2 Skin-to-skin contact

Skin-to-skin contact is one of the main clinical practices that the WHO recommended for achieving positive breastfeeding outcomes. However, some survey respondents indicated that they had not received adequate information regarding this basic information and practice:

...more about the benefits of skin-to-skin. (ID 211)

...skin-on-skin straight after birth. (ID 431)

In particular, the importance of skin-to-skin contact immediately after birth should be taught to all women during pregnancy and actively encouraged in the early postnatal period.

6.3.3.1.3 Benefits of breastfeeding and breastmilk

The benefits of breastfeeding and breastmilk are considered one of the most essential topics of breastfeeding information that have been widely recognised by women. Demonstrably, a few women requested that more information on the benefits of breastfeeding and breastmilk be provided:

More general knowledge of breastfeeding benefits. (ID 284)

6.3.3.1.4 Attachment and positioning

The second topic of general breastfeeding information that women most frequently requested regarded the positioning and attachment of a baby at the breast. Many women commented that they had wanted more information regarding breastfeeding skills:

More variety in hold positions. (ID 38)

Much more on attachment. (ID 54)

All these women had received some degree of breastfeeding education during the antenatal or postpartum period in a hospital. However, these comments suggested that the way midwives and other health professionals teach women about breastfeeding needs to be rethought. Demonstrably, Woman 197 identified that the lack of support she

received when learning how to position and attach her baby led to her and her husband having to do ‘a lot of reading’ to master the techniques successfully:

> *It would have been nice to have more support learning to help baby attach. My husband and I ended up doing a lot of reading ourselves to help guide us with positioning and attachment.* (ID 197)

Fortunately, Woman 197 had the support of her husband to continue to seek out additional information; without this support, she may have weaned her infant onto formula feeds.

6.3.3.2 A specific breastfeeding class

Based on the women’s responses, many hospitals’ antenatal education focuses on subjects related to pregnancy and labour, and breastfeeding education constitutes only a small part of this education. In some circumstances, it may be difficult for hospitals to provide an informative breastfeeding education class. However, Women 50 and 551 noted that antenatal breastfeeding education should be separated from general antenatal education and that the session should be of sufficient length to provide women with the necessary information regarding breastfeeding:

> *I would have liked additional education, such as a separate class just about breastfeeding.* (ID 50)
> *Would like to have done a specific breastfeeding class antenatally.* (ID 551)

Although women had requested a separate breastfeeding class, they had also commented on the value of the breastfeeding classes offered by the ABA[§§]. The ABA classes aimed to provide expectant parents with the knowledge and confidence they need to breastfeed successfully. Woman 56 highlighted that providing women with easier access to the ABA classes would enable them to enhance their knowledge and skills regarding breastfeeding, which would lead to their maternal breastfeeding confidence improving:

> *The ABA breastfeeding education class was so valuable. This should be more widely available during antenatal classes.* (ID 56)

Woman 449 described how much she had valued the breastfeeding meetings (local support group) that the ABA had provided. The local breastfeeding support group held by the ABA covered a wide range of breastfeeding topics, such as breastfeeding tips, how to express and store breastmilk, supply issues, returning to work, weaning, introducing solids and night-time parenting:

> *I had been lucky enough to attend the local Australian Breastfeeding Association meeting, which provided me with a great deal of information and support.* (ID 449)

The group offered information and problem-solving support that helped Woman 449 to increase her confidence in breastfeeding. Although she did not describe the content of the ABA support group fully, she valued them highly in comparison to hospital-based

[§§] The Australian Breastfeeding Association (ABA) is the largest breastfeeding information and support service funded by the Australian Government.

breastfeeding education sessions or classes. Demonstrably, she stated that she had been 'lucky enough' to attend the ABA meeting.

6.3.3.3 Follow-up guidance and information

The third topic of general breastfeeding information that women most frequently requested related to available services and support. Many women requested information regarding when and how to seek support if necessary:

> *More information about services that can help would be good. I had to research these.* (ID 465)
>
> *More comprehensive lists of resources and options for help.* (ID 544)

Woman 465 emphasised the need for information on breastfeeding services to be readily available; she might have spent less time searching for appropriate information when she experienced breastfeeding difficulties if there had been a list of breastfeeding services available. Further, Woman 544 also requested an individualised, comprehensive and up to date 'lists of resources and options', which would provide significant support for women. Providing women with a list of support services may increase their ability to problem-solve and independently request breastfeeding support, which would increase their maternal breastfeeding confidence.

6.3.3.4 Information for special needs and troubleshooting

Some women also requested more information regarding the potential breastfeeding problems they may experience. In particular, women requested information about tongue-tie, slow weight gain of an infant and mastitis:

> *Not just information about why it's important but what to do when you have significant issues with latching, tongue-tie and slow birth weight [gain].* (ID 75)

Although providing women with information about when and from where to seek assistance is important, it may not always be practical to include certain topics in breastfeeding classes as the information or support for what are often complex issues should be provided individually.

Notably, having knowledge of potential breastfeeding problems would enable women to seek assistance or intervention as early as possible to resolve the issue or limit its escalation. Demonstrably, Woman 466 spoke about having wanted more information regarding the circumstances surrounding certain medical issues:

> *Antenatal I would have liked to receive more information on what happens to a baby that is born prem [premature] and how that affects breastfeeding.* (ID 466)

Woman 466 did not provide further information regarding her medical condition during pregnancy. However, it is important to not only provide women with information regarding premature birth but also ensure that support is available regarding feeding a premature infant in the neonatal intensive care unit (NICU), especially if health professionals anticipate that an infant will be admitted to the NICU, or if unexpected circumstances arise after the infant is admitted.

6.3.3.5 Information consistency

Midwives and other health professionals providing consistent support or care can potentially result in building trust with expecting mothers. Consistency also contributes to improving health outcomes. Further, women who received contradictory information or advice from health professionals often became confused, and this lack of consistency negatively affected the trust between the women and midwives or other health professionals. Demonstrably, Woman 44 reported that she had received inconsistent information from various health professionals:

> *Consistent information. All staff when asked questions have different responses as different ways of doing things. For example, one staff [member] told me to feed when baby wakes and another said to wake baby every three hours. It can be very confusing when people are telling you all different things.* (ID 44)

Both pieces of advice that Woman 44 received (i.e., to feed when baby woke and to wake baby every three hours to feed) were not necessarily wrong depending on the situation and the condition of both mother and baby. Nevertheless, midwives must be aware that providing unclear advice can lead to women misinterpreting and misunderstanding the information. Providing contradictory information can also lead to midwives and other health professionals losing their credibility in their patients' eyes.

Demonstrably, the inconsistent support and inadequate information that Woman 611 had received during her hospital stay affected her confidence with breastfeeding and her relationship with the staff in the ward:

> *In hospital, I was given conflicting information on how to breastfeed effectively and this greatly affected my confidence. Baby would latch fine and suckle for long periods of time but would cry constantly. On [the] second night in hospital, the midwife determined that my initial colostrum supply had ceased and baby was not getting enough feed, if any at all. Nothing could be hand expressed. I was offered formula but it was never provided. The next day, I discharged myself and baby, and that night we fed him formula ourselves. Best decision I ever made.* (ID 611)

Receiving conflicting advice likely compounded the breastfeeding issues Woman 611 had been experiencing. Her considering that giving her infant formula the 'best decision [she] ever made' is arguably a reflection of her diminished maternal self-efficacy regarding breastfeeding. Conversely, she did demonstrate self-efficacy in being proactive. Therefore, although bottle-feeding did not result in her continued confidence to breastfeed, it possibly strengthened the perceived positive outcome she had of her and her infant.

6.4 **Summary**

The majority of women who completed the survey question requested further one-on-one assistance by midwives, other health professionals or lactation specialists to master practical breastfeeding skills and develop maternal confidence with breastfeeding in the postpartum period. In particular, many emphasised the need to have received more general breastfeeding information and information for troubleshooting and managing their infant's special breastfeeding needs. Notably, almost 13% of respondents highlighted the significance of breastmilk expression, including AHE, and being educated on this topic. Importantly, having the knowledge and skills to express

breastmilk potentially improved the women's milk production and developed their confidence with breastfeeding.

Many of the women's responses indicated that the content of the contemporary antenatal breastfeeding education they had received was simplistic and superficial. Education programs should include strategic breastfeeding topics that are designed to deal with maternal anxiety regarding breastfeeding and the stress reactions related to trying to breastfeed. Further, information consistency is important. Notably, providing women with conflicting or inconsistent information can result in not only their confusion but also the probability of them having negative interactions with health professionals, which could decrease their maternal breastfeeding self-efficacy.

CHAPTER 7: **DISCUSSION**

7.1 **Introduction**

This study was a cross-sectional web-based survey that used quantitative and qualitative questions, which aimed to explore the effect of AHE on maternal breastfeeding self-efficacy and women's experiences of AHE and their breastfeeding outcomes in the postpartum period. The primary and secondary hypotheses for the quantitative component of this study were:

1. Primary hypothesis: women who expressed breastmilk antenatally enhanced their postnatal breastfeeding self-efficacy compared to women who did not express breastmilk antenatally.

2. Secondary hypothesis: women who expressed breastmilk antenatally were more likely to exclusively breastfeed their infants.

While the qualitative component of this study explored:

1. maternal experiences of AHE of breastmilk and how it affects infant feeding practice

2. maternal perceptions of contemporary antenatal and early postnatal breastfeeding education and support, including breastmilk expression and AHE.

A total of 691 women responded to this survey, of those 576 women were included in the data analysis for this research study. The majority of the women in this research were born in Australia (n = 490: 85.1%), over 30 years old (n = 409: 71.0%), employed (n = 474: 82.3%) and university graduate (n = 423: 73.5%). The women who completed

the BSES-SF were 525. Of those women, who practised AHE (AHE group) were 253 (48.1%). The women in the AHE group who breastfed their infant were 236 (45.0%). While the 272 (51.8%) women did not perform AHE and of those women who did not perform AHE, 257 (49.0%) breastfeed their infants.

In this chapter, the findings of this study will be discussed. Section 1 will address the first aim, hypotheses and the first qualitative objective Women's experiences of AHE and its effect on maternal breastfeeding self-efficacy and breastfeeding outcomes and Section 2 will address the second qualitative objective Women's perceptions of desired contemporary breastfeeding education and support

7.2 **Section 1: Women's experiences of AHE and its effect on maternal breastfeeding self-efficacy and breastfeeding outcomes**

In the first section of this chapter, the findings of the quantitative and qualitative data will be discussed. These findings addressed the aim of this study.

7.2.1 **AHE and maternal breastfeeding self-efficacy**

The quantitative results of this research demonstrated that no correlations between AHE and maternal breastfeeding self-efficacy existed. The mean BSES-SF scores of the group who did perform AHE (M = 53.90, 95% CI [52.37–55.44]) were not significantly different from those of the group who did not perform AHE (M = 52.97, 95% CI [51.44–54.50]; p = 0.40). Breastfeeding methods (i.e., including exclusive breastfeeding, formula feeding and mixed feeding) were not significantly different across the two groups (p > 0.05)—neither were the rates of 'any breastfeeding' after the factors were adjusted in Table 3.7 (OR = 1.28, 95% CI [0.59–2.79]; p = 0.54). Further, no significant relationship between AHE and exclusive breastfeeding rates were found after adjusting

the factors in Table 3.8 (OR = 0.82, 95 % *CI* [0.56–1.19]; p = 0.3). Nevertheless, the BSES-SF scores (< 60 and ≥ 60) were compared between the three groups (AHE-stored breastmilk, AHE-not stored breastmilk and non-AHE). The BSES S-F score in the AHE-stored breastmilk group was highest amongst three groups (AHE-stored breastmilk: 44.0%, AHE -not stored breastmilk: 21.8% and Not AHE: 37%). Women who expressed breastmilk and stored it antenatally were more likely to have higher maternal breastfeeding self-efficacy compared with those who expressed breastmilk but did not store it antenatally ($p < 0.003$). Compared BSES S-F score with women who did not express breastmilk antenatally, women who expressed breastmilk and stored it antenatally were more likely to have high score (60 +) but the difference was not significant statistically ($p > 0.05$)..

The women's responses to the qualitative question (question 28 and 29); women's experience of AHE and its influence on infant feeding practices, produced several significant findings regarding AHE education and support, including that there were positive and negative aspects related to women's experiences of AHE. These questions (question 28 and 29: these questions were combined for data analysis) had 62.0% positive responses. Of note, 80% of those women who had positive responses expressed and stored breastmilk antenatally. While 38.0% of the responses to the question were negative, and 56.0% of those women who gave negative responses expressed but did not stored breastmilk antenatally. Women reported the following four main positive aspects of AHE: mastery, a sense of security, avoiding formula and social persuasion and encouragement. Conversely, women reported the following three main negative aspects of AHE: the challenges they experienced when trying to gain competence, that health professionals had not provided them with sufficient support, and the

physiological and affective states or pain. Is there some literature you can refer to here to support the previous sentence?

7.2.2 **Positive and negative experiences of AHE**

This following section will use the survey's qualitative data to discuss the respondents positive and negative experiences of learning to and becoming competent in hand expressing during the antenatal period. Although the positive and negative components of AHE are discussed in separate sections, many of the women experienced a mixture of both when learning to express antenatally. Of note, some women developed AHE skills relatively easily, whereas others found that they were either difficult or impossible to master.

7.2.2.1 Positive experiences of AHE

The positive experiences of AHE that were identified as contributing to maternal breastfeeding self-efficacy are presented in Figure 7.1.

Figure 7.1: Positive experiences of AHE

7.2.2.1.1 *Mastery experience and security*

The level of a person's self-efficacy is influenced by four antecedent factors (Bandura 1977b; see Chapter 3). Mastery experience is one of the important antecedent factors when developing maternal breastfeeding self-efficacy. In particular, Kingston, Dennis and Sword (2007) stated that mastery experience was the factor most likely to contribute to breastfeeding self-efficacy at four weeks postpartum. The women's most frequent response to the qualitative question (question 28 and 29); women's experience of AHE, was a mastery experience. It acknowledged that AHE assisted the women with developing their maternal breastfeeding self-efficacy. Further, when women realised that they had developed the skill to express breastmilk either antenatally or in the postpartum period, their confidence with breastfeeding increased.

Some women in this study indicated that AHE was not always an easy task to continue. Importantly, when these women were determined to succeed, and they persevered although initially experiencing difficulties expressing, they eventually mastered the skills of AHE. This finding highlighted that women are likely to be successful when they have a strong self-efficacy in their capacity to set a goal and maintain the commitment to master a difficult task (Bandura 1977b, 1994).

Mastery experiences can also assist women to develop a sense of security in their ability to breastfeed. The women in this study described that having breastmilk readily available at birth (mastery experience) served as an emotional safety net that affected their physiological and affective states positively (sense of security). This mastery not only contributed to their developing a sense of security regarding their breastmilk production and their ability to feed their infant in the early postpartum period but also helped them to persevere when they experienced breastfeeding difficulties. Additionally,

Forster et al. (2011) stated that most women in their study who had performed AHE reported to have been positive about the practice; they became competent in expressing breastmilk and their feelings of security regarding breastmilk being readily available for their infant in the early postpartum period increased (i.e., the mastery experience developed the sense of security). Notably, the majority of women who performed AHE commented that they would express and store breastmilk antenatally again if it were necessary (Forster et al. 2011).

7.2.2.1.2 Avoiding formula

The primary purpose for women with complications during pregnancy—in particular, diabetes—to perform AHE is to store breastmilk to avoid supplemental formula feeding (Forster et al. 2011; Forster et al. 2017; Soltani & Scott 2012). Women in the AHE study reported that they had performed AHE due to issues such as having diabetes, low AFI or cholestasis during pregnancy or giving birth via caesarean section. They had anticipated that these medical conditions or interventions could affect their infants' health or their own ability to breastfeed in the early postpartum period. Therefore, the purpose of AHE for these women was not only to avoid formula supplementation but also to improve maternal confidence by actively contributing to their infant's health.

According to Bandura (1977b), an important element of self-efficacy is an individual's belief that there is a likelihood of a behaviour resulting in a specific outcome (outcome expectancy). This element of self-efficacy is particularly important for developing maternal breastfeeding self-efficacy as it inspires women to take actions (i.e., AHE) to ensure their infant is healthy.

7.2.2.1.3 Social persuasion and encouragement

Health motivators and behaviours are influenced by the interaction of individual beliefs, environment and behaviours. For example, patient education programs that were developed by health professionals to enable women with diabetes to be empowered resulted in improved psychosocial self-efficacy (Anderson et al. 1995). Further, when health professionals, peers and family supported the practice of AHE, maternal breastfeeding self-efficacy increased. Notably, the women in this study reported that they were more likely to accept AHE advice from their peers or family if they had experienced unexpected circumstances after the birth of their infants; these experiences gave their peers' advice more authenticity. Additionally, health professionals effectively persuading and encouraging women to perform AHE altered the women's attitudes and enhanced their determination to have stored breastmilk.

Numerous studies have demonstrated the improvement of maternal self-confidence. These studies included an RCT that determined the effect of peer support on maternal self-confidence by implementing kangaroo mother care and the use of peer support that effectively improved maternal self-confidence (Kurniawati, Rustina & Budiati 2019). Additionally, Kingston, Dennis and Sword (2007) identified that most women reported receiving encouragement, praise, consistent advice, and professional feedback positively affected their breastfeeding practices.

Importantly, having positive experiences of AHE resulted in women mastering the practice and experiencing increased feelings of security. Notably, women's ability to persevere through challenges to have a positive experience with AHE requires health professionals, peers and family to provide adequate support; this support can play an important role in altering maternal beliefs and behaviours. Further, the four aspects of

positive maternal experiences of AHE (i.e., mastery, security, avoiding formula and social persuasion and encouragement) intertwine to enhance and strengthen maternal breastfeeding self-efficacy.

7.2.2.2 Negative experiences of AHE

The factors that women considered to have contributed to a potential lack of maternal breastfeeding self-efficacy are presented in Figure 7.2.

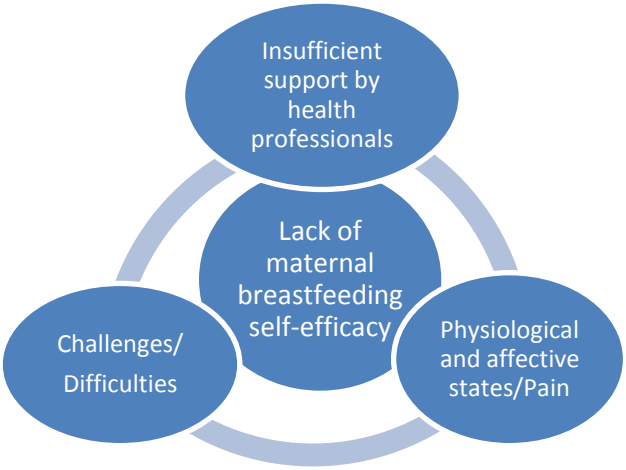


Figure 7.2: Negative experiences of AHE

7.2.2.2.1 Challenges

In this study, the women who struggled or could not express and store breastmilk antenatally described their experiences of AHE as negative. Although the response that women most frequently gave to the question was mastery experience, the second most frequent response were challenges they experienced while trying to perform AHE. A significant number of survey respondents reported that they considered AHE challenging due to the difficulty experienced when learning to master hand expression.

Apparently, many women collected only a few drops of colostrum. Others did not achieve the correct technique even though they had enlisted their partner's support or watched an AHE DVD. Consequently, some of these women discontinued AHE after a few attempts. These women also suggested that mothers should receive more individualised one-on-one assistance when hand expressing.

Some women in this study reported that AHE was a challenging task, which resulted in them considering these difficulties as personal inadequacies. Alternatively, avoiding challenges may be due to women having low self-efficacy, which is when people consider barriers a personal threat that could mean others consider them a failure (Bandura 1977a, 1994). Women with low self-efficacy are more likely than women with high self-efficacy to need health professionals to provide them with individualised one-on-one support. For some women, lacking confidence in their ability to hand express could affect their maternal breastfeeding self-efficacy. However, having received more professional support and education at the right time could have improved these women's AHE experiences and their perceptions of their ability to hand express and breastfeed successfully.

7.2.2.2.2 Insufficient support from health professionals

Some women who reported experiencing challenges when trying to gain competence with AHE attributed their lack of success to having inadequate technical skills and knowledge and not receiving adequate emotional support from health professionals. In this study, women indicated that instead of being shown the process of AHE on a breast model or watching a DVD, they would have preferred not only for midwives or other health professionals to provide in-depth instructional information or a 'hands-on' demonstration but also to practise hand expressing with their own breasts. Further, after

providing adequate information, health professionals must then follow-up with the women to provide them with any additional support or education as necessary; this information should include available community services to prepare the women for common issues that may occur during the early postnatal period. Critically, when health professionals provided ongoing comprehensive observation and emotional and responsive support and had sound communication skills, women developed the appropriate hand expressing skills and maternal breastfeeding self-efficacy.

In this study, women also reported that they had been deprived of their chance of being informed and being able to practise AHE due to receiving fragmented health care. This AHE practice is not always promoted due to a lack of continuity of care or some health professionals having insufficient knowledge. The Australian Government's DoH (2020) highlighted the need for continuity in the pregnancy care guidelines and stated that pregnancy care should take a woman-centred continuity of care approach that addresses women's social, emotional, physical, psychological, spiritual and cultural needs and expectations, rather than the fragmented practice of women visiting a different midwife or doctor at each appointment.

7.2.2.2.3 Physiological and affective states

Critically, this study has illustrated the need for health professionals to not only listen carefully to women's concerns or the difficulties they experience when learning to hand express but also offer them sensitive, individualised and continued support to enhance their mastery experiences. Women's perceptions and interpretations of the physiological events (e.g., pain, awkwardness or discomfort) of AHE can diminish their confidence and sense of mastery, which affects their ability to develop maternal self-efficacy.

Notably, experiencing a minor or moderate degree of pain in the immediate postpartum 138

period had a significantly negative effect on maternal breastfeeding self-efficacy (Kingston, Dennis & Sword 2007); these difficulties may have been diminished if more support and education had been provided during the antenatal period. Although some women perceived these difficulties as resolvable challenges, others interpreted them as personal threats against their ability to be 'good' mothers. Of interest, women's negative bodily and affective states have often been linked to mastering tasks (Bandura 1977a).

This study's findings revealed three prevalent negative aspects of women's AHE experiences. Notably, challenges such as pain that cause negative emotions and physiological states may be due to health professionals not having provided women with sufficient support. This study has identified that health professionals must pay adequate attention to each challenge that women face when learning to express breastmilk antenatally.

7.3 **Section 2: Women's perceptions of desired contemporary breastfeeding education and support**

This section will address maternal perceptions of contemporary breastfeeding education that included AHE. The responses to questions 22 and 24 highlighted two elements of breastfeeding education and support that influenced maternal breastfeeding self-efficacy: the assistance that women received and the information that women received. Some women's responses to this topic were similar to those regarding women's experiences of AHE due to the overlap between the issues involved in both AHE

education and contemporary breastfeeding education. The responses about the education provided were within questions 22 (focusing on types of education women received in the antenatal period) and 24 (focusing on women's additional need for breastfeeding education in the antenatal and postnatal period). The intention of this research was not to do an overall critique of breastfeeding education.

7.3.1 **Various types of assistance to develop maternal breastfeeding self-efficacy**

Women identified that the following three types of assistance were necessary when developing maternal breastfeeding self-efficacy: individualised one-on-one support, assistance with expressing breastmilk or AHE and the provision of coping strategies and emotional support. Critically, women's most frequently given response to this question (question 24) was individualised one-on-one support.

7.3.1.1 Individualised one-on-one support

Women's comments regarding their negative experiences of AHE highlighted the lack of individualised support available for AHE. Their desire to receive more breastfeeding education and support demonstrated that midwives need to consider the provision of individualised education and support. A common concern for many women in this study was the lack of ongoing one-on-one assistance provided by a midwife or other health professional to support them when learning AHE or breastfeeding skills and to offer emotional support. Notably, UNICEF and the WHO (2018) identified individualised support and education as a necessary component in learning how to breastfeed in their 'Ten Steps to Successful Breastfeeding'. This document emphasised that *all* women not just first-time mothers should receive individualised attention as they may have had a negative breastfeeding experience and need support to avoid those problems (UNICEF & WHO 2018).

Receiving individualised one-on-one assistance in combination with attending group sessions is an ideal strategy to motivate women to continue breastfeeding (Haroon et al. 2013). However, this study's findings revealed the gap between women's expectations and the reality of maternity services. Demonstrably, respondents identified the need for having additional time with midwives when trying to breastfeed in the first few days after giving birthing. Further, women also reported that their negative experiences in hospital were due to chronic staff shortages or high workloads. Notably, postnatal care reportedly receives less attention than other areas of maternity services. For example, many hospitals have consistently reported low maternal satisfaction with care in the post-birth period (Crowther, MacIver & Lau 2019).

There is a need to have minimal staff in maternity services, hospitals must deploy existing staff effectively and this issue is not just about staff numbers (Sandall et al. 2011). Some maternity services in the UK are introducing measures to redistribute midwives' time to enable for the more direct care of women. The 'Releasing Time to Care' program being implemented by the UK's National Health Service is one example of this (Sandall et al. 2011). Similarly, NSW Health has also been providing hospitals with the opportunity to implement the 'The Productive Ward programs' (NSW Health 2017) a similar program to "Releasing Time to Care'. To date in 2014 a pilot evaluation was conducted with positive outcomes (NSW Health 2017).

The women who articulated the importance of individualised support also requested that an LC provide routine assessments or educational sessions before they were discharged from a hospital, regardless of whether they were experiencing breastfeeding issues. Several studies have shown that women who received lactation support from an LC were more likely to continue to breastfeed than those who received only standard

breastfeeding support (K.A. Bonuck et al. 2005; Hopkinson & Konefal Gallagher 2009). Further, women who received breastfeeding support from an LC had significantly higher BSES-SF scores compared to those who received support from other health professionals, such as midwives, physicians or public health nurses (Kingston, Dennis & Sword 2007).

Conversely, providing routine LC assistance or assessment to *all* women before they are discharged from hospital is unrealistic and impractical considering the small number of LCs in the hospital system, the cost of LC training and how early after birth women are discharged. Therefore, *all* midwives must demonstrate competence in providing breastfeeding education and support and be able to assist women to manage the initiation of breastfeeding during the first days of the postpartum period. Critically, UNICEF and the WHO (2018) recommended that 'facilities providing maternity and newborn services should have a clearly written breastfeeding policy that is routinely communicated to staff' (p 19). All midwives and other health professionals, who provide infant feeding services, including breastfeeding support, should have sufficient knowledge, competence and skills to support women to breastfeed. To achieve this level of competence with breastfeeding, all staff who have breastfeeding support and education responsibilities must be trained and be required to maintain adequate evidence-based knowledge and skills (UNICEF & WHO 2018). Additionally, the Midwife Standards for Practice (Nursing and Midwifery Board of Australia [NMBA] 2018**)** stipulate midwives participate in continuing professional development to maintain the required knowledge and skill base for safe and effective practice to maintain and provide safe and competent practice.

7.3.1.2 Assistance with expressing breastmilk or AHE

Women who responded to the survey expressed how important learning AHE skills are, and one in ten respondents requested that education of breastmilk expression include AHE. Women's responses to this question (question 24) highlighted that knowing how to express breastmilk includes knowing how to perform AHE, a practice that can potentially assist women not only to reduce their stress levels regarding their ability to produce milk but also to improve their confidence in breastfeeding their infants. Critically, women who are advised to perform AHE and are provided with adequate education and support are likely to become competent in hand expressing and confidence with breastfeeding (Demirci et al. 2019).

The women in this study requested that *all* women be taught and encouraged to learn and practice AHE. This response highlights the need for education to be offered regardless of pregnancy risk factors due to the potential for women to experience unforeseen breastfeeding problems in the early postpartum period.

The use of videos to learn how to express breastmilk was raised by several women as a source of learning due to the lack of formal instruction being provided by health professionals. One recent study that evaluated the use of an online AHE video to assist women learn this skill demonstrated an increase in self-confidence and AHE knowledge (O'Sullivan, Cooke, McCafferty & Giglia 2019). The use of a video has the potential to be a low-cost and effective strategy to provide education to pregnant women that they can access at a time and place convenient to the woman.

The BFHI and step 5 of the 'Ten Steps to Successful Breastfeeding' required that 'mothers should be coached on how to express breastmilk as a means of maintaining lactation in the event of their being separated temporarily from their infants' (UNICEF

& WHO 2018, p. 24). UNICEF and the WHO (2018) aimed for at least 80% of mothers of breastfed preterm and term infants to enable them to describe or demonstrate correctly how to express breastmilk. Although it has been recommended to implement this education and support during the early postpartum period, providing AHE support was not discussed in 'Ten Steps to Successful Breastfeeding' (UNICEF & WHO 2018). The issue is a lack of research that shows the safety and efficacy of AHE.

7.3.1.3 Provision of coping strategies and emotional support

The women's responses have highlighted the need for health professionals to listen carefully to women's concerns and to offer ongoing comprehensive observation and emotionally responsive support to develop their positive mastery experience of AHE. Further, a significant number of women's responses to question 24 demonstrated the need for health professionals to provide women with coping strategies and emotional assistance due to the potential emotional and psychological distress that can occur if attempts at AHE are unsuccessful or perceived as unsuccessful.

Contemporary antenatal breastfeeding education is a means with which to increase women's knowledge and skills of breastfeeding (Willumsen 2013). However, statistics from the ANIFS indicated that less than a quarter (15%) of infants are being exclusively breastfed up to the age of five months (AIHW 2010). This finding is well below the WHO's recommendation to exclusively breastfeed infants up to the age of six months (AIHW 2010; WHO 2017a). This could indicate that receiving only basic information regarding breastfeeding knowledge and skills may not be enough to assist women to develop maternal breastfeeding confidence (Craig and Dietsch 2010) and can result in misconceptions of their expectations about the potential outcomes and amount of milk likely to be expressed.

Notably, women's written responses to this study emphasised that the content of contemporary antenatal breastfeeding education is simplistic and superficial. Respondents identified a lack of realistic information in breastfeeding education regarding breastfeeding challenges and the coping strategies with which they could manage these difficulties. Connecting women with a breastfeeding support group during the antenatal period would likely enable them to develop appropriate coping strategies. The women in this study requested assistance to connect with such a group. Notably, interacting with peers who have had similar breastfeeding experiences in a support group was identified as a way for women to overcome concerns and could become a strong motivator in developing breastfeeding confidence. Interacting with other pregnant women and experienced mothers and also learning about their experiences and the strategies they used to overcome breastfeeding issues would provide expecting women with the potential to develop vicarious breastfeeding experience.

Online information is a way to increase women breastfeeding and AHE knowledge and skills. This information should be reliable and easy to access (Alianmoghaddam, Phibbs & Benn 2019). A potential outcome is the ability to increase peer connections and access increased emotional support.

Women's responses to this study implied that activating and increasing maternal resilience would require antenatal breastfeeding education programs to include more psychosocial and strategic components. This resilience would then enhance maternal breastfeeding self-efficacy and encourage women to breastfeed their infants for extended periods.

More generally, the growth and impact of social media can be perceived as both a positive or negative influence in the way women understand, learn about and accept the

physical act of breastfeeding. Social media can be a source of peer support as highlighted in research by Bridges, Howell and Schmied (2018) investigating the specific breastfeeding topics, women requested additional knowledge when participating in an ABA closed Facebook group.

7.3.2 **Various types of information to develop maternal breastfeeding self-efficacy**

Women most frequently requested the following information to develop maternal self-efficacy: more general breastfeeding information, specific breastfeeding classes, follow-up guidance and information for special needs and troubleshooting. Of particular note was the need for information consistency, more general breastfeeding information, specific breastfeeding classes, follow-up guidance and information consistency were identified as being critically related to enhancing maternal AHE experiences and breastfeeding self-efficacy.

7.3.2.1 More general information

When asking for information regarding breastfeeding, respondents most frequently requested fundamental breastfeeding topics, including infant's behaviour and normal feeding patterns during the early postpartum period. Specific topics that were requested included lactogenesis, how frequently to breastfeed a newborn, feeding on demand and infant cues, skin-to-skin contact, the benefits of breastfeeding and breastmilk, and attachment and positioning. These topics were not dissimilar to those identified in a study by Bridges, Howell and Schmied (2018) during closed Facebook groups facilitated by the ABA.

Arguably, these are the most important and fundamental breastfeeding topics that all women should have received information about during pregnancy. Pregnant women and their family must have basic information about breastfeeding, and breastfeeding education should include information regarding not only the importance and advantages of breastfeeding and breastmilk but also practical skills, such as positioning and attachment, on-demand feeding and recognising feeding cues (UNICEF & WHO 2018).

The women in this study noted that they had received some degree of antenatal breastfeeding education. However, the structure and content of the antenatal breastfeeding education that they received varied between hospitals. Noticeably, some women received minimal breastfeeding input during antenatal education classes while other women were provided with intensive input from an LC. Importantly, a critical review or changes to the structure or content of breastfeeding education classes are necessary. The health staff that facilitate breastfeeding education must not only be required to have adequate training and have developed effective skills and knowledge to facilitate learning but also be able to provide women with evidenced-based breastfeeding information during the antenatal and postnatal periods.

7.3.2.2 A specific breastfeeding class

Respondents identified a specific need to change the structure or content of breastfeeding education classes. A significant number of the women in this study suggested that such a change should be in the form of a separate breastfeeding education class. However, the women stipulated that a separate breastfeeding class should be long enough to cover a wide range of breastfeeding topics. For example, suggested topics included breastfeeding tips, troubleshooting advice, information on AHE and storing breastmilk and breastfeeding challenges (including strategic information and advice

detailing how to manage these challenges). Notably, several researchers (Craig & Dietsch 2010; Nichols et al. 2009; Otsuka et al. 2013) have identified that antenatal breastfeeding education should use a strength-based approach to enable women to develop maternal breastfeeding self-efficacy. In this study, respondents also commented on the value of the breastfeeding classes offered by the ABA. The ABA not only provide breastfeeding education classes but also organise peer support groups to help breastfeeding women in their own community. Of note is that peer support groups will provide opportunities for vicarious experiences to occur; the often-missing opportunity for women learning to breastfeed as demonstrated in this study. An antenatal breastfeeding education class conducted jointly by a hospital and the ABA would be greatly beneficial.

7.3.2.3 Follow-up guidance and information

Respondents confirmed the need for a strength-based approach to breastfeeding education. A strength-based approach:

> … focuses on strengths versus deficits, is collaborative versus hierarchical, builds on resources versus expert opinion, focuses on solutions and competencies versus what needs to be fixed, and focuses on what is working versus what is not (Swartz 2017. p. 1).

Health care professionals are increasingly using new approaches with reference to the idea of co-production. Co-production provides an exploratory space where a generative process can occur (Filipe, Renedo & Marston 2017). This is a concept that encourages and supports women to be actively involved in the management of their health care (Fowler et al. 2012). Co-production includes collaboratively working together from the start to the end of the service provision. A proposed outcome of co-production is the

co-design, co-implementation and co-evaluation of interventions (Filipe, Renedo & Marston 2017). This collaborative approach enables ongoing parental learning and capability development using their existing knowledge and experiences, in contrast to more traditional "expert" practices (Fowler et al. 2012). For example, assisting women not only recognise when interventions were necessary but co-designing interventions to improve their breastfeeding attempts or resolve their breastfeeding difficulties but also where they can access community support. A co-production approach supports women to participate in problem identification and problem-solving to ensure interventions are able to be implemented by the women (Fowler et al. 2012).

Knowing from where to seek help and setting a follow-up appointment after being discharged from hospital are essential to increase women's postpartum sense of security (Persson et al. 2011). Notably, Australia and several other European countries have a well-developed and free universal child and family health service that provides services and programs to support women during the postnatal period (Schmied et al. 2010). In some circumstances, a woman's transition of care from a midwife to a child and family health nurse may not occur due to a lack of information provided to the woman or a miscommunication between the maternity service and the child and family health service (Homer et al. 2009).

UNICEF and the WHO (2018) highlighted that receiving timely support after being discharged from hospital is instrumental in maintaining women's breastfeeding rates; therefore, facilities have a responsibility to provide appropriate referrals to ensure that a health worker follows-up with mothers and babies two to four days after birth, and again in the second week, to assess their feeding situation. Further, facilities also have a responsibility to engage with the surrounding community to enhance women's

accessibility to resources, including primary healthcare centres, community health workers, home visitors, breastfeeding clinics, nurses and midwives, LCs, peer counsellors, mother-to-mother support groups or parenting support lines.

7.3.2.4 Information consistency

Critically, the women highlighted the importance of information consistency in developing AHE skills and maternal confidence. Some of the women in this study appear to be lacking in confidence about their ability to breastfeed their infants. While this was never formally stated that they lacked confidence it was implied. This may have been due to a lack of understanding about the expected amount of colostrum that women are able to express during the antenatal period. The need has been highlighted for accurate evidence-base information about the changes and amount of colostrum at each developmental stage during the later period of pregnancy and postnatally. For instance, some women wrote of only being able to express a drop of colostrum and identified this as a failed attempt at AHE, even though this amount is within the expected norm in the antenatal period. While other women using social media found information about expressing, resulting in their concerns reinforced or misinformation perpetuated (Regan & Brown 2019). The majority of the women identified that they would like to be informed of the potential value and contraindications of AHE. If the woman agrees and it is identified as a safe practice for her, the woman should be informed of the potential value and contraindications of AHE and actively supported to learn how to hand express.

Consistency of the support or care that midwives and other health professionals provide can potentially assist build trust between health workers and expectant and new mothers.

Notably, a critical change is needed in this area as midwives or other health professionals providing inconsistent breastfeeding advice has been a persistent and longstanding issue (Simmons 2002a). Critically, respondents identified that they had constantly received contradictory responses or advice from health professionals. These inconsistencies resulted in confusion and hindered the development of trust between women and midwives or other health professionals. Significantly, research has shown that inconsistent advice disempowers women and negatively affects their breastfeeding self-efficacy (Beeken & Waterston 1992; Simmons 2002a, 2002b).

The provided research and the findings of this study support the need to implement an improved evidence-based education process that supports increasing health professionals' knowledge and skills. Hospitals are required to offer continuous education (Australian Government DoH 2013), monitor breastfeeding practices and identify and address health professionals' beliefs that are not based on evidence, and that may harm the development of maternal breastfeeding self-efficacy.

7.4 **Research limitations**

As an outcome of this research several limitations were identified and recommendations for future research have been identified in Section 7.5.5. The participants recruited for this study were postpartum women who could read and write English and who had an infant aged up to six months. No one was excluded due to their cultural background. Participants were recruited via social media, which limited respondents to those who had access to digital technologies. Future research should focus on women of diverse backgrounds, with study parameters at different time points (antenatal and postnatal) based on a variety of ethnic, cultural, religious and spiritual beliefs and perspectives, varied socioeconomic status, the complexity of pregnancy, antenatal mental health and

also type of maternity facilities where women received care from (e.g. the BFHI, private or public hospitals).

For this research, a pilot study was not conducted. The content and size of the questionnaire were reviewed by the supervisors and an e-Research officer at the University of Technology Sydney. In accordance with their advice, the length of questionnaire, a number of qualitative questions, and a number of multistep questions were adjusted to maximise a number of responses (McInroy 2016). The validly of two instruments (i.e., the Infant Feeding Practice Questionnaire and the BSES-SF) applied for the research have been tested by the original researchers and have been used extensively in breastfeeding studies in several countries with different populations. The Infant Feeding Practice Questionnaire was modified according to this study's aims, and the content validity of the modified version was discussed.

7.5 **Recommendations**

Six main recommendations have been identified as outcomes of this AHE study. These recommendations have significant implications for clinical practice and the way in which the breastfeeding education component is offered within antenatal and postpartum education.

7.5.1 **Including AHE information in antenatal breastfeeding education as a compulsory measure**

This study has not conclusively identified the use of AHE as of value to all pregnant women. However, based on the participants' responses, the majority of the women identified that they would like to be informed of the potential value and contraindications of AHE. If the woman agrees and it is identified as a safe practice for

them they should be supported to learn how to hand express during the antenatal period. This may act to reduce the potential to experience unforeseen breastfeeding problems in the early postpartum period.

7.5.2 **Improving individualised one-on-one support**

The women's responses to the two qualitative questions in the AHE study highlighted the importance of individualised one-on-one support for both AHE and breastfeeding education and support. It is essential that women receive not only unrushed and individualised one-on-one sessions with midwives that includes emotional support and information regarding breastmilk expression and AHE but also breastfeeding support in the first few days postpartum. The women also reported that their negative experiences during their hospital admission resulted from a chronic staff shortage or due to the presence of significant staff workloads. The women's experience has been supported by recent studies involving midwifery workload issues that have been highlighted as an ongoing concern and needing reform (Callander, Sidebotham, Lindsay & Gamble 2021; Lopes, Titulaer, Bokosi, Homer & Hoope-Bender 2015). Consequently, midwives' workloads will need to be reviewed to enable increased focused time to be spent with each woman before they are discharged. Furthermore, knowing where to get help and having a planned follow-up appointment after discharge from a hospital are essential for women's postpartum sense of security and increased maternal breastfeeding confidence (Maleki-Saghooni, Barez & Karimi 2020; McLeish & Redshaw 2017). In this study women did not always understand where they could readily access support for community services. This finding is supported by research conducted by Hession, Fowler, Rossiter and Schmied (2017) that identified women with young children are confused about the available services and how to access these services. Clear discharge

pathways need to be developed and regularly reviewed to ensure that post-discharge women know where they can access universal child and family health services and other community breastfeeding support services. This recommendation is supported by previous research that found a fragmentation of services and inadequate communication between services (Schmied, Homer, Fowler, Psalia, Barclay, Wilson, Kemp, Fasher & Kruske 2015).

7.5.3 **Improving staff education regarding breastfeeding support**

This study's findings identified that a main reason for women's lack of success with AHE was not only inadequate technical and emotional support but also information inconsistency. WHO/UNICEF (2018) stated that timely and appropriate support for breastfeeding women can only be accomplished if staff have the knowledge, competence and skills to carry it out. Pre-service education has a prominent role in the development and reinforcement of health professionals' knowledge and skills before they gain the qualifications to work within a health service. However, an employing facility must also provide evidence-based education to staff who provide antenatal and postnatal breastfeeding education, mentoring and support. Consequently, facilities should implement the following measures as a minimum standard of competency: robust breastfeeding policies, access to annual breastfeeding courses, supervised clinical experiences and compulsory competency assessments. Additionally, health professionals should consistently access breastfeeding education via external professional development courses throughout their careers.

7.5.4 **Improving the quality of and access to antenatal breastfeeding education classes**

The women in this AHE study stated that a separate breastfeeding education class is desirable. Ensuring women are provided with adequate time in antenatal breastfeeding education is vital to assist them learn not only basic breastfeeding tips but also about topics such as how to identify common breastfeeding problems and when to seek professional assistance, breastmilk expression and storage, AHE, breastmilk supply issues and breastfeeding challenges. In particular, an increased strength-based focus is needed in antenatal breastfeeding education to enable women to develop maternal breastfeeding self-efficacy.

In this AHE study, the women also reported the value of the breastfeeding classes offered by the Australian Breastfeeding Association (ABA). It will be beneficial if an antenatal breastfeeding education class can be jointly conducted by a hospital and the ABA.

7.5.5 **Conducting future research**

Further research into the value and influence of AHE on maternal breastfeeding self-efficacy is required. In particular, an AHE intervention study that collects both quantitative (i.e., interviews) and qualitative (i.e., observation) data using an RCT needs to be undertaken. This type of research will enable the relationship between AHE and maternal breastfeeding self-efficacy development to be studied deeply.

There is a need for research that focuses on pregnant women of diverse backgrounds, with study parameters at different time points (antenatal and postnatal) based on not only a variety of ethnic, cultural, religious and spiritual beliefs and perspectives, varied

socioeconomic status, the complexity of pregnancy, antenatal physical and mental health and also type of maternity facilities where women received care from (e.g. the BFHI, private or public hospitals).

The most recent ANIFS is 10 years old, meaning the available data is quite dated and potentially of no relevance. A new survey is urgently required to gauge the effectiveness of the breastfeeding education and support that Australian women are currently receiving.

Finally, the lack of evidence found within the research literature review process addressing the issue of AHE education and support requires further investigation. This would require a focus on both individual and group level education and support.

7.5.6 **Enhancing education method and policy**

The use of videos to learn how to express breastmilk was raised by several women as a source of learning due to the lack of formal instruction being provided by health professionals. One recent study that evaluated the use of an online AHE video to assist women learn this skill demonstrated an increase self-confidence and AHE knowledge (O'Sullivan, Cooke, McCafferty & Giglia 2019). The use of a video has the potential to be a low-cost and effective strategy to provide education to pregnant women that they can access at a time and place convenient to the woman.

AHE has been increasingly acknowledged as important in assisting all pregnant women to increase their breastfeeding self-efficacy. These changing attitudes indicated that the 'Ten Steps to Successful Breastfeeding' should be updated to include support and recommendations for AHE (UNICEF & WHO 2018).

7.6 **Conclusion**

This study explored not only maternal experiences of AHE and its effect on maternal breastfeeding self-efficacy and breastfeeding outcomes in the postpartum period but also maternal perceptions of contemporary breastfeeding education that included AHE. The qualitative and quantitative data that this study produced were contradictory. Although the quantitative findings revealed no significant correlations between AHE and maternal breastfeeding self-efficacy or breastfeeding outcomes, the qualitative findings highlighted that AHE can be used as a strategy to enhance maternal breastfeeding self-efficacy. Further, the demonstrated issues with AHE education or support and contemporary breastfeeding education highlighted areas that need improvement. As such, this study provided six critical recommendations to address these issues.

Appendix A: The online REDCap survey—Women's experiences of AHE

Survey: Antenatal hand expression of breast milk and mothers' self-efficacy (confidence) with breastfeeding

SURVEY INFORMATION/CONSENT FOR MOTHERS

Introduction

You are invited to participate in a research study into: antenatal hand expression of breast milk and mothers' breastfeeding self-efficacy (confidence).
The study is being conducted as part of requirements for Masters degree of Junko Schettino under the supervision of Professor Cathrine Fowler and Dr Fenglian Xu at the University of Technology of Sydney. This survey has the following objectives of understanding:

1. Impact of antenatal hand expression of breast milk on mothers' breastfeeding self-efficacy (confidence) in the postpartum period.

2. Impact of antenatal hand expression of breast milk on breastfeeding practices in the postpartum period.

3. Mothers' perception of antenatal hand expression of breast milk.

To be eligible for this study: We would like to invite all mothers with babies birth-to-6 months to participate in this research. We want to know about your feeding experiences with your baby who is either breastfeed, bottle-feed or, mixed breast and bottle-feed. For this study we need responses from both mothers who expressed breast milk antenatally and mothers who did not express breast milk antenatally.

Study Procedures

If you agree to participate in this study, you will be asked to tick the box at the end of this information/consent message, you are indicating that you have read the information and have understood this information/consent message and agree to participate in this research. Please print a copy of this page for your records.

Voluntary Participation

This survey takes approximately 20 minutes to complete. However, your participation in this study is entirely voluntary. You do not have to take part in it. If you do take part, you can withdraw at any time without having to give a reason.

This survey is anonymous and only general identifiers will be collected and confidentiality will be protected. Your information will be combined with information

from other people taking part in this research. You will not be identified in these study results. The results of this research will be published, however, all information will be de-identified to ensure you cannot be identified. Collected information will be stored in a secure server at the University of Technology Sydney. This database can only be accessed by the three researchers named on this information sheet.

Cost

Participation in this research will not cost you anything, nor will you be paid.

Further Information

If you have any concerns or questions about this research, please feel free to contact Professor Cathrine Fowler on [redacted] or e-mail Cathrine.Fowler@uts.edu.au. If the topic of this survey raises other concerns of personal or mental health issues, Lifeline can be contacted on 13 11 14 or http://www.lifeline.org.au. You may wish to contact your local GP or Child and Family Health Nurse to obtain appropriate support.

Ethics Approval and Complaints

This study has been approved by both the Ethics Review Committee (RPAH Zone) of the Sydney Local Health District (Approval number: X18-0293) and the UTS Human Research Ethics Committee (Approval number: UTS HREC REF NO. ETH18-2965). Any person with concerns or complaints about the conduct of this research should contact either the Executive Officer on 02 9515 6766 (the Sydney Local Health District: the Ethics Review Committee: RPAH Zone) or UTS Human Research Ethics Committee (Research.Ethics@uts.edu.au).

To commence the survey please answer the following questions:

I am a mother of an infant from birth to 6 months old
Yes No

I can speak and understand English
Yes No

I have read the above information and voluntarily agree to participate in the research survey
Yes No

Socio-demographic Questions

1 What is your age?

◯ Younger than 15 years old ◯ 15-19 years old ◯ 20-29 years old ◯ 30-39 years old
◯ 40 years old or above

2 What is you occupation?

_____

3 What is the highest level of education you have completed?

◯ Primary school ◯ High school (Y10) ◯ High school (Y12) ◯ Professional training (e.g: TAFE)
◯ University (undergraduate) ◯ University (Postgraduate) ◯ Others

Your answer was 'Others'. Please provide information.

_____

4 Approximately, what was your total family income for the past 12 months (AUD)?

◯ Less than $20,000 ◯ $ 20,000-60,000 ◯ greater than $ 60,000

5 What is your marital status?

◯ Married ◯ Divorced or separated ◯ Widowed ◯ Unmarried ◯ Others

Your answer was 'Others'. Please provide information.

_____

6 Which country were you born in?

_____

7 Were you employed or studying outside the home in the past 6 months?

◯ Yes full-time employed ◯ Yes part-time employed ◯ Yes full-time student ◯ Yes part-time student
◯ No

Infant Feeding Practices 1

8 How old is this baby now?

◯ Younger than 1 month old ◯ 1 month to 3 months old ◯ 4 months to 6 months old

9 What was this baby's gestational age at birth?

◯ Under 33 weeks ◯ 34-36 weeks ◯ 37 weeks and over

10 Birth weight

◯ Less than 2500g ◯ 2500-3000g ◯ 3001-3500g ◯ 3501-4000g ◯ 4001g-over

11 Did you smoke cigarettes during this pregnancy?

◯ Yes ◯ No

How many did you smoke a day?

◯ 5 or less ◯ 6-9/day ◯ 10 or more/day

12 Did you drink alcohol during this pregnancy?

◯ Yes ◯ No

How much did you drink ?

◯ 1 standard drink/week ◯ 2-3 standard drinks/week ◯ 1 standard drink/day ◯ More than 1 standard drink/day

13 How did you give birth to this baby?

◯ Vaginal without perineum side cutting
◯ Vaginal with perineum side cutting
◯ Vaginal without forceps or suction
◯ Vaginal with forceps or suction
◯ Caesarean: elective
◯ Caesarean: emergency

14 Is this baby first child?

◯ Yes ◯ No- 2nd child ◯ No-3rd child ◯ No-4th or more ◯ Others

Your answer was 'Others'. Please provide information.

_____

15 What was this baby's first feed?

◯ Breastfeeding ◯ Formula ◯ Expressed breast milk ◯ Water ◯ Others

Your answer was 'Others'. What was this baby's first feed?

_____

16 When did you first decide how to feed this baby?

◯ After this baby was born ◯ Before conception ◯ Early in my pregnancy ◯ Late in my pregnancy

17 What were reasons for your choice of feeding methods?

18 Have you ever breastfeed this baby?

◯ Yes ◯ No

How long did you breastfeed this baby?

_____
(weeks)

How long was it before this baby was put to the breast after the birth?

◯ Immediately after birth ◯ Within 30 minutes after birth ◯ Between 30 minutes to 1 hour after birth
◯ Others

Your answer was 'Others'. Please provide information.

_____

Breastfeeding Self-Efficacy (confidence): For each of the following statements, please choose the answer that breast describes how confident you are or were with breastfeeding this baby. There is no right or wrong answer.

	Not at all confident	Not very confident	Sometimes confident	Confident	Very confident
I can always determine that my baby is getting enough milk	○	○	○	○	○
I can always successfully cope with breastfeeding like I have with other challenging tasks	○	○	○	○	○
I can always breastfeed my baby without using formula as a supplement	○	○	○	○	○
I can always ensure that my baby is properly latched on for the whole feeding	○	○	○	○	○
I can always manage the breastfeeding situation on my satisfaction	○	○	○	○	○
I can always manage the breastfeed even if my baby is crying	○	○	○	○	○
I can always keep wanting to breastfeed	○	○	○	○	○
I can always comfortably breastfeed with my family present	○	○	○	○	○
I can always be satisfied with my breastfeeding experience	○	○	○	○	○
I can always deal with the fact the breastfeeding can be time consuming	○	○	○	○	○
I can always finish feeding my baby on one breast before switching to the other breast	○	○	○	○	○
I can always continue to breastfeed my baby for every feeding	○	○	○	○	○
I can always manage to keep up with my baby's breastfeeding demands	○	○	○	○	○
I can always tell when may baby is finished breastfeeding	○	○	○	○	○

Infant Feeding Practice 2

How long did it take for your milk to come in?

◯ Within one day of the birth ◯ The second day after the birth ◯ The third day after the birth
◯ Others

Your answer was 'Others'. Please provide information.

19 Has this baby spent anytime in a Special Care Nursery?

◯ Yes ◯ No

Your answer was 'Yes'. Please provide reasons for Special Care Nursery admission.

20 Did your mother breastfeed any of her children?

◯ Yes ◯ No ◯ Don't know

21 How have your friends fed their babies?

◯ Most of them formula-fed ◯ Most of them breastfed ◯ Some breastfed and some formula-fed
◯ Friends don't have babies

22 During pregnancy, did you received any of breastfeeding education from the hospital staff (you can provide multiple answers)?

☐ Pamphlet or booklet ☐ Videos or slides ☐ Lectures or classes ☐ Individual consultation on breastfeed
☐ Demonstration on how to express breast milk ☐ Others

Your answer was 'Others'. Please provide information.

23 What do you think about breastfeeding education/information given by the hospital?

◯ Very useful ◯ Somewhat useful ◯ Don't know ◯ Not very useful ◯ Not useful at all

24 In thinking back about the type of breastfeeding education you received: what additional information would you have like to have received (antenatally or postnatally)?

25 How do you feed this baby now ?

◯ Breastfeeding only ◯ Breastfeeding+water or juice ◯ Breastfeeding+formula (mixed feed)
◯ Formula feeding only ◯ Breastfeeding+infant solid food ◯ Formula feeding+infant solid food
◯ Mixed feeding+infant solid food

Antenatal Hand Expression of Breast Milk

26 Have you expressed breast milk before birth?

◯ Expressed and stored it ◯ Expressed but not stored ◯ Did not express

28 Please describe your antenatal experiences of hand expressing and storing breast milk.

29 Has this experience of antenatal hand expressing influenced your choice of infant feeding method?

◯ Yes ◯ No

Your answer was 'Yes'. How did it influence your choice of infant feeding method?

Appendix B: Infant Feeding Practices Questionnaire

(Xu et al. 2007) Your name:_____ Mobile:_____ Home phone number:_____

Email: _____ Address:_____ Postcode: _____

Interview Date:___/_____/

1. **How are you feeding your baby?**
   - 1.1 Breastfeeding only ---------- 1
   - 1.2 Breastfeeding + (sugar) water ---------- 2
   - 1.3 Breastfeeding + juice ---------- 3
   - 1.4 Mainly breastfeeding but 'topping up' with bottle-feeding4
   - 1.5 Mainly bottle-feeding but also breastfeeding ---------- 5
   - 1.6 Bottle-feeding only ---------- 6
   - 1.7 Other (please specify):_____

2. **What was your baby's first feed?**
   - 2.1 Formula---------- 1
   - 2.2 Breastmilk (or colostrum)---------- 2
   - 2.3 Expressed breast milk after birth ---------- 3
   - 2.4 Expressed breast milk before birth ---------- 3
   - 2.5 Water---------- 3
   - 2.6 Other (please specify):_____ 6

3. **If the baby is fed water, juice or other food besides breastmilk,**

   Why feed baby this? _____

4. **Have you learn how to express breastmilk from midwife before birth?**
   - 4.1 No
   - 4.2 Yes, start to express milk at_____ gestational age.

5. **Have you stored breastmilk before birth?**
   - 5.1 No
   - 5.2 Yes, approximately _____mL before the baby was born.

6. **Have you learn how to massage breast before birth?**
   - 6.1 No
   - 6.2 Yes, from whom you learn the massage? _____

7. When did you first decide how to feed your new baby?

7.1 After my baby was born---------- 1
7.2 Before I became pregnant---------- 2
7.3 Late in my pregnancy ---------- 3
7.4 Early in my pregnancy ---------- 4
7.5 Other (please specify):_____

8. Who helped you decide whether you would bottle-feed or breastfeed? (Please circle any answers that apply. You can have more than one answer.)

8.1 No one ---------- 1
8.2 The baby's father---------- 1
8.3 My mother ---------- 1
8.4 Doctor---------- 1
8.5 Other (please specify):_____ 1

9. What were the reasons for your choice to bottle-feed?

9.1 Bottle-feeding is as good as breastfeeding ---------- 1
9.2 Bottle-feeding is easier---------- 1
9.3 I will go back to work ---------- 1
9.4 Breastfeeding will make my breasts sag---------- 1
9.5 The baby's father prefers bottle-feeding---------- 1
9.6 My mother suggested bottle-feeding ---------- 1
9.7 My health problem: _____
9.8 Other: _____

10. Has your baby spent anytime in a Special Care Nursery?

No ---------- 0
Yes ---------- 1

11. How was your baby fed when he/she was in the nursery?

11.1 Breastfeeding ---------- 1
11.2 Expressed breastmilk ---------- 2
11.3 Bottle-feed formula ---------- 3
11.4 Other (please specify):_____

12. During pregnancy, have you received any of the following from hospital staff?

12.1 Pamphlets on breastfeeding baby ---------- 1
12.2 Lectures or classes on breastfeeding baby---------- 1
12.3 Demonstrations on how to breastfeed baby ---------- 1
12.4 Demonstrations on how to express breastmilk---------- 1
12.5 Video (TV) or slideshow on how to breastfeed baby ------ 1
12.6 Individual consultation or discussion with any of the staff about breastfeeding baby---------- 1
12.7 Samples of infant formula ---------- 1
12.8 Booklets or other information about infant formula ------- 1
12.9 None of the above---------- 1
12.10 Other (please specify):_____ 1

13. What do you think about the information given by the hospital?

13.1 Very useful---------- 1
13.2 A little useful ---------- 1
13.3 Not necessary ---------- 1
13.4 Boring---------- 1
13.5 Does not meet the need---------- 1
13.6 Other (please specify):_____

14. Did your mother breastfeed any of her children?

Yes ---------- 1
No ---------- 0
Don't know -- 2

15. Does your mother have any preference for how you feed your baby?

Yes, she prefers bottle-feeding---------- 1
Yes, she prefers breastfeeding ---------- 2
She doesn't mind how I feed my baby---------- 3
Never really discussed the matter with her---------- 4

16. Does the baby's father have any preference for how you feed your baby?

16.1 Yes, he prefers bottle-feeding ---------- 1
16.2 Yes, he prefers breastfeeding---------- 2
16.3 He doesn't mind how I feed my baby ---------- 3
16.4 Never really discussed the matter with him ---------- 4

17. How have your friends fed their babies?

17.1 Most of them bottle-fed ---------- 1
17.2 Most of them breastfed---------- 1
17.3 Some breastfed and some bottle-fed ---------- 1
17.4 Friends don't have babies ---------- 1

18. Did they buy a bottle 'just in case'?

18.1 No
18.2 Yes

19. Have you ever attended any antenatal classes or lectures on how to feed your baby?

19.1 Yes, for this pregnancy---------- 1
19.2 Yes, for a previous pregnancy---------- 1
19.3 No ---------- 1

20. When do you plan to give your baby solid food?_____(months)

21. How was your baby delivered?

21.1 Vaginal without forceps or suction---------- 1
21.2 Vaginal with perineum side cutting ---------- 2
21.3 Vaginal with forceps or suction---------- 3
21.4 Caesarean---------- 4

22. Has your baby had any health problems, either since the birth or as a result of the birth?

Yes ---------- 1
No ---------- 0

23. If yes, what health problems has your baby had?

_____

24. Is this the first child you have given birth to?

Yes ---------- 1
No ---------- 0

25. If NO, how long was the previous child breastfed?

Child's name	Exclusive breastfeeding (months)	Total breastfeeding period (months)

26. How long was it before your baby was put to the breast after the birth?

26.1 Immediately after birth, cord still attached 1
26.2 Within _____ (minutes)
26.3 Within _____ (hours)
26.4 Within _____(days)
26.5 Other (please specify):_____

27. How long was it before your milk came in?

27.1 Within one day of the birth ---------- 1
27.2 The second day of the birth---------- 2
27.3 The third day of the birth ---------- 3
27.4 Still waiting for the milk to come in ------- 4
27.5 Other (please specify):_____

28. Did any staff member teach you how to position and attach your baby to the breast?

Yes ---------- 1
No ---------- 2
I didn't need to be taught ---------- 3

29. After you leave the hospital, who will you contact with if you have problems with feeding your infant?

29.1 Doctor---------- 1
29.2 Nurse---------- 2
29.3 Midwife---------- 3
29.4 Other (please specify):_____

30. Did you have any health problems during this pregnancy?

No ---------- 1
Yes, high blood pressure---------- 2
Yes, high blood glucose level---------- 3
Yes, cold ---------- 4
Other (please specify): _____

31. Did you have any medications during the pregnancy?

No ---------- 1
Yes, it is: _____

32. How about your life during the pregnancy?

Very happy---------- 1
Good ---------- 2
General ---------- 3
Bad ---------- 4
Other (please specify): _____

33. Have you taken any medication recently?

No ---------- 1
Yes, it is: _____

34. Do you smoke cigarettes?

Yes ---------- 1
No ---------- 0

35. Do you drink alcohol?

No ---------- 0
Yes, how much a week? _____ mL

This section for breastfeeding

36. Is your breastmilk enough for your baby?

Yes ---------- 1
No ---------- 2
Don't know -- 3

37. If YES, how do you know?

37.1 Breast is engorged ---------- 1
37.2 Baby is full after breastfeeding ---------- 1
37.3 Baby is satisfied ---------- 1
37.4 Can feel effective sucking ---------- 1
37.5 Other (please specify):_____

38. If NO, how do you know?

38.1 Baby sucks hard and long but is not satisfied---------- 1
38.2 Baby is hungry in an hour after breastfeeding ---------- 1
38.3 Breast is not full before feeding---------- 1
38.4 Other (please specify):_____

39. Who is the most important person to support your breastfeeding?

39.1 Husband ---------- 1
39.2 My mother ---------- 2
39.3 Mother-in-law ---------- 3
39.4 Other (please specify):_____

40. Did any staff member check how your baby's mouth was attached to your breast when you first started feeding?

Yes ---------- 1
No ---------- 0

41. Why did you decide to breastfeed?

41.1 The baby's father wanted me to breastfeed ---------- 1
41.2 Breastmilk is better for the baby---------- 1
41.3 Breastfed babies are more intelligent ---------- 1
41.4 Breastfeeding is the right thing to do---------- 1
41.5 Breastfeeding is cheaper ---------- 1
41.6 Breastfeeding is more convenient ---------- 1
41.7 Breastfeeding helps you losing weight---------- 1
41.8 Breastfeeding is fashionable---------- 1
41.9 Mother and baby become closer ---------- 1
41.10 Emptying the breast is good for mother ---------- 1
41.11 _____ advised me to breastfeed ---------- 1
41.12 Other (please specify):_____ 1

42. Have you experienced any of the following since you started breastfeeding?

42.1 Inverted nipples ---------- 1
42.2 Cracked or sore nipples ---------- 1
42.3 Baby gets too much milk---------- 1
42.4 Baby gets milk too fast---------- 1
42.5 Takes a long time before milk starts flowing at start of feed---------- 1
42.6 Baby too tired to suck ---------- 1
42.7 Difficulty expressing milk ---------- 1
42.8 Baby has problems sucking---------- 1
42.9 Breasts engorged (too full) ---------- 1
42.10 Baby doesn't wake up for feeds---------- 1
42.11 Not enough milk or colostrum for baby ---------- 1
42.12 Feeling that I'm not doing very well at breastfeeding ----- 1
42.13 Often press produced too much milk---------- 1
42.14 Breast is leaking---------- 1
42.15 Other (please specify):_____

43. How long you intend to breastfeed your baby? _____ (months)

44. At what age do you plan to start giving your baby supplemental food?
_____(months)

This section for all participates

The following information about you will help us to analyse data. We recognise that some of the questions are very personal. Please remember that they will remain strictly confidential.

1. **Gestation age at birth:** _____
2. **Birth weight:** _____ (kg)
3. **What is your occupation?**_____

4. **Were you employed or studying outside home in the past 6 months?**

   Yes, full-time employed ---------- 1
   Yes, part-time employed ---------- 2
   Yes, full-time student ---------- 3
   Yes, part-time student ---------- 4
   No ---------- 5

5. **How long will you stay with baby at home before you go to work or study?**

   _____ days --------- 1
   1 year ---------- 2
   As long as I like ---- 3

6. **Which country were you born in?** _____

7. **What is your age?** _____

8. **What is the highest level of education you have completed?**

   Primary school---------- 1
   Junior high school---------- 2
   Senior high school ---------- 3
   Professional training school ---------- 4
   University ---------- 5
   Postgraduate ---------- 6
   Other (please specify): _____

9. **How many years of schooling have you completed?** _____

10. **Approximately, what was your total family income for the past 12 months?**
    _____(AUD)

11. **What is your marital status?**

    Married ---------- 1
    Divorced or separated ---------- 2
    Widowed ---------- 3
    Unmarried ---------- 4
    Other (please specify): _____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION

Interviewer sign: _____ Interview date: _____/_____/

Hospital: _____

Appendix C: Letter from Professor Dennis granting permission to use the BSES-SF and the BSES-SF template

Cindy-Lee Dennis <cindylee.dennis@utoronto.ca>

Wed 5/07/2017 3:27 AM

Junko schettino;

Fenglian Xu;

Cathrine Fowler

Dear Junko,

Thank you for your email and interest in my Breastfeeding Self-Efficacy Scale. Attached is the short-form for use in your research study. Thank you again for your interest in my BSES-SF.

Warm regards,

Cindy-Lee

Cindy-Lee Dennis, PhD

Professor in Nursing and Medicine, Dept. of Psychiatry

Canada Research Chair in Perinatal Community Health

Women's Health Research Chair, Li Ka Shing Knowledge Institute, St. Michael's Hospital

University of Toronto

155 College St

Toronto, Ontario

Canada M5T 1P8

Tel: (416) 946-8608

www.cindyleedennis.ca

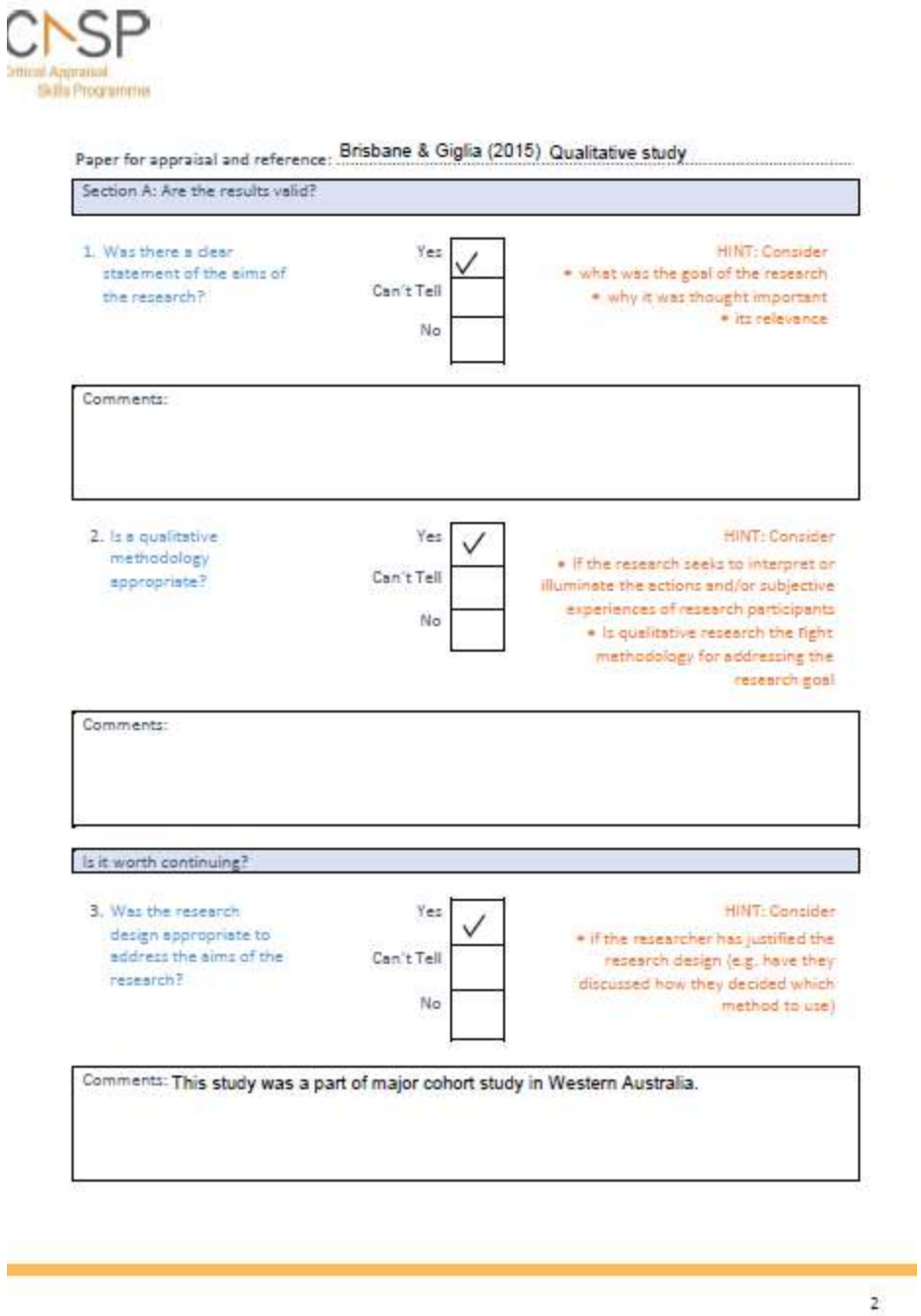
Breastfeeding Self-Efficacy Scale – Short Form

For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer.

1	I can always determine that my baby is getting enough milk	1	2	3	4	5
2	I can always successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5
3	I can always breastfeed my baby without using formula as a supplement	1	2	3	4	5
4	I can always ensure that my baby is properly latched on for the whole feeding	1	2	3	4	5
5	I can always manage the breastfeeding situation to my satisfaction	1	2	3	4	5
6	I can always manage to breastfeed even if my baby is crying	1	2	3	4	5
7	I can always keep wanting to breastfeed	1	2	3	4	5
8	I can always comfortably breastfeed with my family members present	1	2	3	4	5
9	I can always be satisfied with my breastfeeding experience	1	2	3	4	5
10	I can always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5
11	I can always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
12	I can always continue to breastfeed my baby for every feeding	1	2	3	4	5
13	I can always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
14	I can always tell when my baby is finished breastfeeding	1	2	3	4	5

Appendix D: Example of CASP (qualitative study)

This checklist was used to assist in the review of the literature for the Integrative Literature Review Chapter 2.



CASP
Critical Appraisal Skills Programme

Paper for appraisal and reference: Brisbane & Giglia (2015) Qualitative study

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes ✓ | Can't Tell | No

HINT: Consider
- what was the goal of the research
- why it was thought important
- its relevance

Comments:

2. Is a qualitative methodology appropriate?

Yes ✓ | Can't Tell | No

HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

Comments:

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes ✓ | Can't Tell | No

HINT: Consider
- If the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments: This study was a part of major cohort study in Western Australia.

2

CASP
Critical Appraisal Skills Programme

4. Was the recruitment strategy appropriate to the aims of the research?

Yes	✓
Can't Tell	
No	

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments:

5. Was the data collected in a way that addressed the research issue?

Yes	✓
Can't Tell	
No	

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments:

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6. Has the relationship between researcher and participants been adequately considered?

Yes	
Can't Tell	✓
No	

HINT: Consider
- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments:

Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes	✓
Can't Tell	
No	

HINT: Consider
- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments:

CASP
Critical Appraisal Skills Programme

8. Was the data analysis sufficiently rigorous?

Yes	✓
Can't Tell	
No	

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments:

9. Is there a clear statement of findings?

Yes	✓
Can't Tell	
No	

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments:

CASP
Critical Appraisal Skills Programme

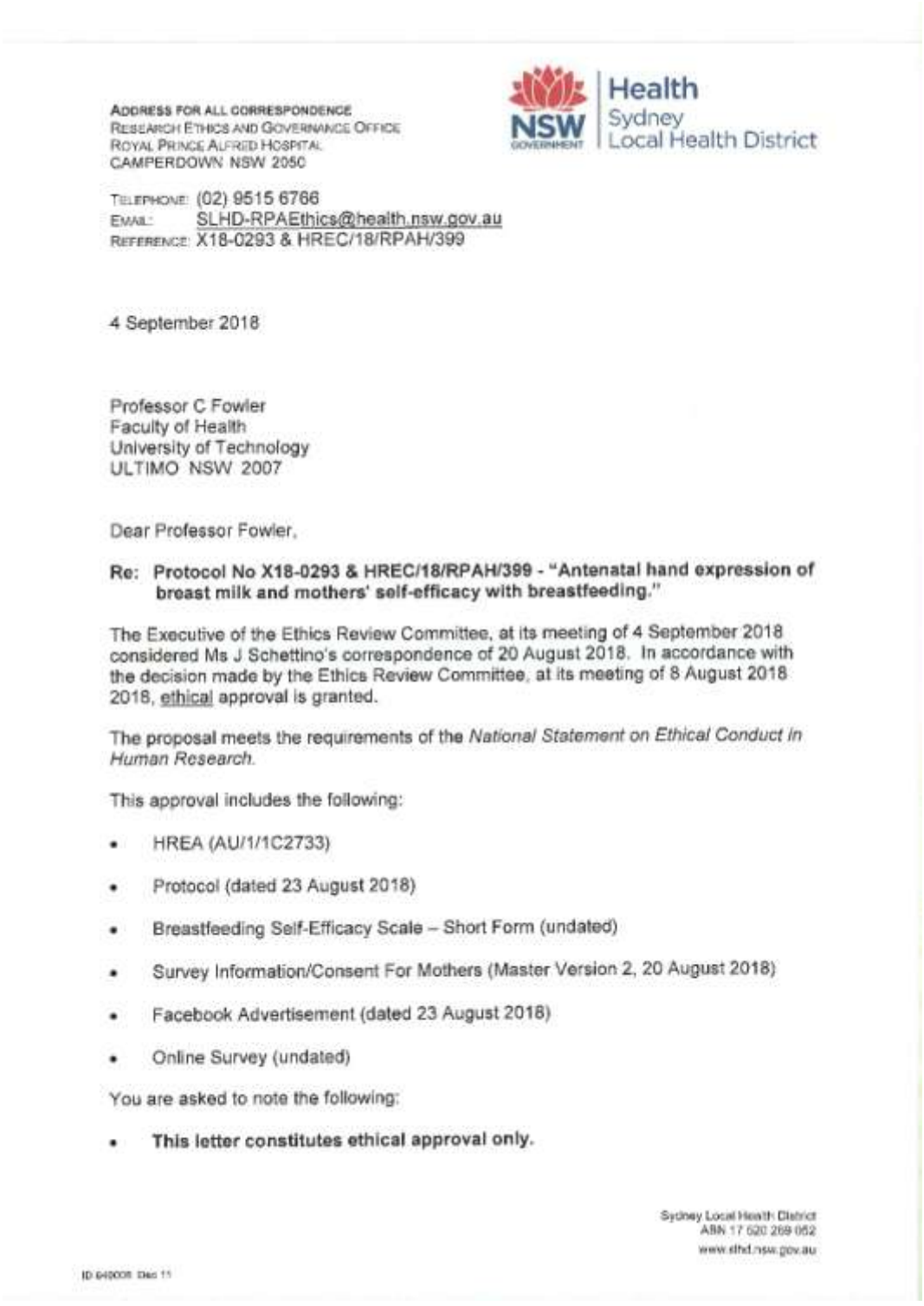
Section C: Will the results help locally?

10. How valuable is the research?	HINT: Consider • If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature • If they identify new areas where research is necessary • If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

Comments:

The Autours stated both positive and negative effects of antenatal breastmilk expression. The findings of this study can be extended to further examine maternal breatfeeding self-efficacy and breastfeeding outcomes.

Appendix E: Ethics approval from the Human Research Ethics Committee of Sydney Local Health District (approval number: X18-0293& HREC/18/RPAH/399)



ADDRESS FOR ALL CORRESPONDENCE
RESEARCH ETHICS AND GOVERNANCE OFFICE
ROYAL PRINCE ALFRED HOSPITAL
CAMPERDOWN NSW 2050

TELEPHONE: (02) 9515 6766
EMAIL: SLHD-RPAEthics@health.nsw.gov.au
REFERENCE: X18-0293 & HREC/18/RPAH/399

Health
NSW GOVERNMENT
Sydney
Local Health District

4 September 2018

Professor C Fowler
Faculty of Health
University of Technology
ULTIMO NSW 2007

Dear Professor Fowler,

Re: Protocol No X18-0293 & HREC/18/RPAH/399 - "Antenatal hand expression of breast milk and mothers' self-efficacy with breastfeeding."

The Executive of the Ethics Review Committee, at its meeting of 4 September 2018 considered Ms J Schettino's correspondence of 20 August 2018. In accordance with the decision made by the Ethics Review Committee, at its meeting of 8 August 2018 2018, ethical approval is granted.

The proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research.*

This approval includes the following:

- HREA (AU/1/1C2733)
- Protocol (dated 23 August 2018)
- Breastfeeding Self-Efficacy Scale – Short Form (undated)
- Survey Information/Consent For Mothers (Master Version 2, 20 August 2018)
- Facebook Advertisement (dated 23 August 2018)
- Online Survey (undated)

You are asked to note the following:

- **This letter constitutes ethical approval only.**

Appendix F: Ethics approval of the amendment to the approved protocol from the Human Research Ethics Committee of Sydney Local Health District (approval number: X18-0293& HREC/18/RPAH/399)

ADDRESS FOR ALL CORRESPONDENCE
RESEARCH ETHICS AND GOVERNANCE OFFICE
ROYAL PRINCE ALFRED HOSPITAL
CAMPERDOWN NSW 2050

TELEPHONE: (02) 9515 6766
EMAIL: SLHD-RPAEthics@health.nsw.gov.au
REFERENCE: X18-0293 & HREC/18/RPAH/399
9.17/JAN19

Health
NSW GOVERNMENT
Sydney
Local Health District

29 January 2019

Professor C Fowler
Faculty of Health
University of Technology
ULTIMO NSW 2007

Dear Professor Fowler,

Re: Protocol No X18-0293 & HREC/18/RPAH/399 - "Antenatal hand expression of breast milk and mothers' self-efficacy with breastfeeding."

The Executive of the Ethics Review Committee, at its meeting of 24 January 2019 considered J Schettino's correspondence of 11 January 2019 and gave its approval of the following:

- Protocol (Version 2, 11 January 2019)

Yours sincerely,

Merela Ghazal
Acting Executive Officer
Ethics Review Committee (RPAH Zone)

HERC\EXECOR\19-01

Appendix G: Site-specific clearance from the Tresillian Family Care Centre

Tresillian
It's in our nature to nurture

15 June 2018

Ms Junko Schettino
Faculty of Health
University of Technology Sydney
235 Jones Street
Ultimo NSW

Dear Junko

Re: Antenatal Hand Expression of Breast Milk and Mothers' Self-Efficacy

I am happy for Tresillian to support your Masters of Research Study by posting the recruitment notice and survey link on Tresillian's Facebook page.

Yours sincerely

A/Prof Jenny Smit
Director of Clinical Services

All correspondence to:
Locked Bag 1003, Campsie, NSW 2194
www.tresillian.org.au

Tresillian Canterbury
McKenzie Street, Belmore, NSW 2192
P: (02) 9787 8800 F: (02) 9787 8888
E: tresillian.canterbury@swahs.nsw.gov.au

Tresillian Nepean
10 Barber Avenue, Kingswood, NSW 2747
P: (02) 4734 2124 F: (02) 4734 2453
E: tresillian.nepean@swahs.nsw.gov.au

Tresillian Manly Wollongong
1 Berwick Street, Wollongong, NSW 2500
Parents & Babies Service
P: (02) 4258 4882
E: parentsandbabies@swahs.nsw.gov.au

Guthrie Child Care Centre
25 Shirley Road, Wiley Park, NSW 2195
P: (02) 9452 4040 F: (02) 9452 4041
E: guthrie@swahs.nsw.gov.au

Tresillian Wiley Park
25 Shirley Road, Wiley Park, NSW 2195
P: (02) 9452 4000 F: (02) 9452 4020
E: tresillian.wileypark@swahs.nsw.gov.au

Tresillian Willoughby
2 Second Avenue, Willoughby, NSW 2068
P: (02) 9967 8380 F: (02) 9967 8381
E: tresillian.willoughby@swahs.nsw.gov.au

Tresillian Lismore
46 Uralba Street, Lismore, NSW 2480
P: (02) 6622 6705
E: tresillian.lismore@swahs.nsw.gov.au

Appendix H: Site clearance from The Bub Hub

Research Request / Student Midwives & Student Doulas

- **Research Requests** - You are welcome to ask our forum members for assistance with genuine research requests. There is a section of our forum set up specifically for research requests such as this. You are welcome to post your call-out for survey participants in that section of our forum.
- **Student Midwives & Student Doulas** - You are welcome to offer your services to our forum members. All services must be offered free of charge. There is a section of our forum set up specifically for offers from student midwives & doulas. Please post your request in that section of the forum. Please only post once and just in that section (multiple posts will be deleted).
- **How to Post** - In order to post on our forum, you do need to be a registered member of our forum, however, this is free of charge and only takes a few moments to sign up. Register here.

We strongly recommend that you **do not** put your mobile phone number in your post and that, instead, you include a contact email address using spaces within the address – eg aperson @ researchfac.org.au (please remove the spaces if you wish to contact me) Our site gets heavily indexed by Google and other search engines and including your email address in a conventional format can result in your email being scraped and used by external spam mailing lists.

the bub hub

trusted by parents since 2002

Appendix I: Approval of the survey advertisement on the Sydney Mums Group Facebook page

Re: Sydney Mums Group - Sponsorship: Junko Schettino

From: Brooke Tasovac <brooke@sydneymumsgroup.com.au>
Sent: Wednesday, 20 February 2019 8:26 PM
To: Junko Schettino
Subject: Re: Sydney Mums Group - Sponsorship: Junko Schettino

Hi Junko,

Thanks very much, I have advised the admin and moderators that you are now a sponsor and you are welcome to post as of tomorrow morning.

Just be sure to say 'SPONSOR POST' at the top of the post so that they know not to delete it.

If you have any further questions, please don't hesitate to let me know.

Kind Regards,

Brooke at Sydney Mums Group.

Appendix J: Ratification to an approval protocol from the University of Technology Sydney

From: Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au>
Sent: Tuesday, 13 November 2018 4:21 PM
To: Junko Schettino; Cathrine Fowler; Research Ethics; Fenglian Xu
Subject: UTS HREC Approval - ETH18-2965

Dear Applicant

[External Ratification: Sydney Local Health District (SLHD) HREC approval – X18-0293 & HREC/18/RPAH/399 – Approved: 4th September 2018 and this approval is valid for four years]

The UTS Human Research Ethics Expedited Review Committee has reviewed your application titled, 'Antenatal hand expression of breast milk and mothers' self-efficacy with breastfeeding', and agreed that the application meets the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that your external ethics approval has been ratified.

This ratification is subject to the standard conditions outlined in your original letter of approval.
You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy (http://www.gsu.uts.edu.au/policies/research-management-policy.html).

Research Management Policy - UTS Policy

www.gsu.uts.edu.au

Research Management Policy 1. Purpose and objectives. 2. Scope. 3. Principles. 4. Policy statements. 4.1 Preparation and submission of a research proposal

Your approval number is UTS HREC REF NO. ETH18-2965.

Approval will be for the period specified above and subject to the provision of evidence of continued support from the above-named Committee.

Please note that the ethical conduct of research is an on-going process. The National

Statement on Ethical Conduct in Research Involving Humans requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually, and at the end of the project (if it takes more than a year).

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of approval. If you require a hardcopy please contact Research.Ethics@uts.edu.au.

To access this application, please follow the URLs below:
* if accessing within the UTS network: https://rm.uts.edu.au
* if accessing outside of UTS network: https://vpn.uts.edu.au , and click on 'RM6 – Production' after logging in.

We value your feedback on the online ethics process. If you would like to provide feedback please go to: http://surveys.uts.edu.au/surveys/onlineethics/index.cfm

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely,

Dr Tim Luckett
(Acting) Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology Sydney
E: Research.Ethics@uts.edu.au
I:
https://staff.uts.edu.au/topichub/Pages/Researching/Research%20Ethics%20and%20Integrity/Human%20research%20ethics/human-research-ethics.aspx

E13-6

Appendix K: Ratification to the amendment of an approved protocol from the University of Technology Sydney

RE: Application for ratification to an approval protocol: Junko Schettino
Emma Kirk
on behalf of Research Ethics
Reply all
Today, 9:04 AM
Junko Schettino;
Cathrine Fowler;
Brie Turner
Inbox
You replied on 18/02/2019 9:46 AM.
Attachments
Dear Junko,

Thank you very much for sending these documents through to us for our records. In general, we do not require further ratification to amendments once they have been approved by their primary HREC, for changes such as these we simply save a copy the approved updated documents to our approval record.

I have updated our records accordingly, there are no further actions that need to be taken at this time.

Kind regards,
Emma

Emma Kirk, PhD
Research Ethics Administrator

Research and Innovation Office
University of Technology Sydney
T. +61 (02) 9514 2478
Building 1, Level 14
Broadway NSW 2007 Australia (PO Box 123)
uts.edu.au

Appendix L: Research Integrity for Students (modules 1–5)

Research Integrity for Students

Certificate of Completion

This is to certify that

Junko Schettino

has successfully completed

Module 1: Research Integrity and Code of Conduct

Professor Lori Lockyer,
Dean, Graduate Research School

University of Technology Sydney

Date: *12/09/2019*

Research Integrity for Students

Certificate of Completion

This is to certify that

Junko Schettino

has successfully completed

Module 2: Plagiarism and Misconduct
Module 3: Risk Assessment
Module 4: Risk Management and Health & Safety
Module 5: Project Management

Professor Lori Lockyer,
Dean, Graduate Research School

University of Technology Sydney

Date: 12/09/2019

REFERENCES

Alianmoghaddam, Phibbs & Benn 2019 “I did a lot of googling: a qualitative study of ecclusive breastfeeding support through social media. Women and Birth 32: 147-156.

Anderson, R.M., Funnell, M.M., Butler, P.M., Arnold, M.S., Fitzgerald, J.T. & Feste, C.C. 1995, ‘Patient empowerment. Results of a randomized controlled trial’, *Diabetes Care*, vol. 18, no. 7, pp. 943–9.

Ansari, S., Abedi, P., Hasanpoor, S. & Bani, S. 2014, ‘The effect of interventional program on breastfeeding self-efficacy and duration of exclusive breastfeeding in pregnant women in Ahvaz, Iran’, *ISRN Otolaryngology*, vol. 2014, pp. 1–6.

Association of Breastfeeding Mothers 2017, *Expressing your milk before baby arrives: antenatal expression of colostrum*, leaflet, ABM.

Attrill, B. 2002, ‘The assumption of the maternal role: a developmental process’, *Australian Journal of Midwifery*, vol. 15, no. 1, pp. 21–5.

Australian Breastfeeding Association 2015, *Submission by the Australian Breastfeeding Association on Infant Nutrition Council Limited applications for authorisation A91506 and A91507*, ABA, <https://www.accc.gov.au/system/files/public-registers/documents/D15%2B127882.pdf>.

Australian Breastfeeding Association 2017, *Antenatal expression of colostrum*, ABA, <https://www.breastfeeding.asn.au/bfinfo/antenatal-expression-colostrum>.

Australian Bureau of Statistics 2019, *National health survey: first results, 2017–18*, cat. no. 4364.0.55.001, ABS, Canberra, <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.001~2017-18~Main%20Features~Breastfeeding~10019>.

Australian College of Midwives 2018, *Baby Friendly Health Initiative (BFHI)*, ACM, <https://www.midwives.org.au/baby-friendly-health-initiative-bfhi>.

Australian Government Department of Health (DoH) 2012, *Maternal and infant health*, Department of Health, <http://www.health.gov.au/internet/publications/publishing.nsf/Content/int-comp-whocode-bf-init~int-comp-whocode-bf-init-ico~int-comp-whocode-bf-init-ico-aus>.

Australian Government Department of Health 2013, *Review of Australian Government health workforce programs*, Department of Health, <https://www1.health.gov.au/internet/publications/publishing.nsf/Content/work-review-australian-government-health-workforce-programs-toc~chapter-3-ensuring-capable-qualified-health-workforce~chapter-3-health-education-training>.

Australian Government Department of Health 2020, *Pregnancy care guidelines*, Department of Health, viewed 28 March 2020, <https://www.health.gov.au/resources/pregnancy-care-guidelines/part-a-optimising-pregnancy-care/providing-woman-centred-care>.

Australian Institute of Health and Welfare 2010, *Australian National Infant Feeding Survey: indicator results*, AIHW, viewed 15 September 2017, <https://www.aihw.gov.au/reports/mothers-babies/2010-australian-national-infant-feeding-survey/contents/table-of-contents>.

Baby Friendly Health Initiative Australia 2020, *About BFHI*, BFHI, <https://bfhi.org.au/about/>.

Bäckström, C.A., Hertfelt Wahn, E.I. & Ekström, A.C. 2010, 'Two sides of breastfeeding support: experiences of women and midwives', *International Breastfeeding Journal*, vol. 5, pp. 20–7.

Bandura, A. 1977a, 'Self-efficacy: toward a unifying theory of behavioural change', *Psychological Review*, pp. 191–215.

Bandura, A. 1977b, *Social learning theory*, Prentice Hall, Englewood Cliffs, N.J.

Bandura, A. 1994, 'Self-efficacy', in V.S. Ramachaudran (ed.), *Encyclopaedia of human behaviour*, vol. 4, Academic Press, New York, NY, pp. 71–81.

Bartick, M. 2013, 'Breastfeeding and health: a review of the evidence', *Journal of Women, Politics & Policy*, vol. 34, no. 4, pp. 317–29.

Beeken, S. & Waterston, T. 1992, 'Health service support of breast-feeding—are we practising what we preach?', *British Medical Journal (International Edition)*, vol. 305, no. 6848, p. 285.

Binns, C.W. & Scott, J.A. 2002, 'Breastfeeding: reasons for starting, reasons for stopping and problems along the way', *Breastfeeding Review: Professional Publication of the Nursing Mothers' Association of Australia*, vol. 10, no. 2, pp. 13–9.

Blair, A., Cadwell, K., Turner-Maffei, C. & Brimdyr, K. 2003, 'The relationship between positioning, the breastfeeding dynamic, the latching process and pain in breastfeeding mothers with sore nipples', *Breastfeeding Review*, vol. 11, pp. 5–10.

Blyth, R., Creedy, D.K., Dennis, C.L., Moyle, W., Pratt, J. & De Vries, S.M. 2002, 'Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory', *Birth*, vol. 29, no. 4, pp. 278–84.

Bonuck, K., Stuebe, A., Barnett, J., Labbok, M.H., Fletcher, J. & Bernstein, P.S. 2014, 'Effect of primary care intervention on breastfeeding duration and intensity', *American Journal of Public Health*, vol. 104, Suppl. 1, pp. S119–27.

Bonuck, K.A., Trombley, M., Freeman, K. & McKee, D. 2005, 'Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months', *Pediatrics*, vol. 116, no. 6, pp. 1413–26.

Bridges N, Howell G & Schmied V (2018) Exploring breastfeeding support on social media, International Breastfeeding Journal 13:22 http://doi.org/10.1186/s13006-018-0166-9.

Brisbane, J.M. & Giglia, R.C. 2015, ‘Experiences of expressing and storing colostrum antenatally: a qualitative study of mothers in regional Western Australia’, *Journal of Child Health Care*, vol. 19, no. 2, pp. 206–15.

Brooks, J., McCluskey, S., Turley, E. & King, N. 2015, ‘The utility of template analysis in qualitative psychology research’, *Qualitative Research in Psychology*, vol. 12, no. 2, pp. 202–22.

Callander E, Sidebotham M, Lindsay D & Gamble J. 2021, 'The future of the Australian midwifery workforce – impacts of ageing and workforce exit on the number of registered midwives', *Women and Birth*, 34(1), pp. 56-60.

Casey, J.R.R., Banks, J., Braniff, K., Buettner, P. & Heal, C. 2019, ‘The effects of expressing antenatal colostrum in women with diabetes in pregnancy: a retrospective cohort study’, *The Australian & New Zealand journal of Obstetrics & Gynaecology*, vol. 59, no. 6, pp. 811–18.

Casey, J.R.R., Mogg, E.L., Banks, J., Braniff, K. & Heal, C. 2019, ‘Perspectives and experiences of collecting antenatal colostrum in women who have had diabetes during pregnancy: a North Queensland semistructured interview study’, *BMJ Open*, vol. 9, no. 1, p. e021513.

Centers for Disease Control and Prevention 2018, *Breastfeeding*, CDC, <https://www.cdc.gov/breastfeeding/about-breastfeeding/index.html>.

Chapman, T., Pincombe, J. & Harris, M. 2013, ‘Antenatal breast expression: a critical review of the literature’, *Midwifery*, vol. 29, no. 3, pp. 203–10.

Chapman, T., Pincombe, J., Harris, M. & Fereday, J. 2013, 'Antenatal breast expression: exploration and extent of teaching practices amongst International Board Certified Lactation Consultant midwives across Australia', *Women and Birth: Journal of the Australian College of Midwives*, vol. 26, no. 1, pp. 41–8.

Clarke, V. & Braun, V. 2018, 'Using thematic analysis in councelling and psychotherapy research: a critical reflection', *Councelling & Psycholothearpy*, vol. 18, no. 2, pp. 107–10.

Cleveland, A.P. & McCrone, S. 2005, 'Development of the Breastfeeding Personal Efficacy Beliefs Inventory: a measure of women's confidence about breastfeeding', *Journal of Nursing Measurement*, vol. 13, no. 2, pp. 115–27.

Cox, S. 2004, 'What's normal in the first week after birth?', *Breastfeeding Review*, vol. 12, no. 3, pp. 5–7, errata, 2005, vol. 12, no. 2, p. 23.

Cox, S. 2006, 'Expressing and storing colostrum antenatally for use on the newborn period', *Breastfeeding Review*, vol. 14, no. 3, pp. 11–6.

Cox, S. 2010, 'An ethical dilemma: should recommending antenatal expressing and storing of colostrum continue?', *Breastfeeding Review*, vol. 18, no. 3, pp. 5–7.

Craig, H.J. & Dietsch, E. 2010, ' "Too scary to think about": first time mothers' perceptions of the usefulness of antenatal breastfeeding education', *Women and Birth*, vol. 23, no. 4, pp. 160–5.

Critical Appraisal Skills Programme 2017, *Critical Appraisal Skills Programme (CASP)*, CASP, <http://www.casp-uk.net/casp-tools-checklists>.

Crowther, S., MacIver, E. & Lau, A. 2019, 'Policy, evidence and practice for post-birth care plans: a scoping review', *BMC Pregnancy & Childbirth*, vol. 19, no. 1.

Demirci, J.R., Glasser, M., Fichner, J., Caplan, E. & Himes, K.P. 2019, ' "It gave me so much confidence": first- time US mothers' experiences with antenatal milk expression', *Maternal & Child Nutrition*, vol. 15, no. 4.

Dennis, C.L. 1999, 'Theoretical underpinnings of breastfeeding confidence: a self-efficacy framework', *Journal of Human Lactation: Official Journal of International Lactation Consultant Association*, vol. 15, no. 3, pp. 195–201.

Dennis, C.L. 2003, 'The breastfeeding self-efficacy scale: psychometric assessment of the short form', *Journal of Obstetric, Gynecologic & Neonatal Nursing*, vol. 32, no. 6, pp. 734–44.

Dennis, C.L. & Faux, S. 1999, 'Development and psychometric testing of the Breastfeeding Self-Efficacy Scale', *Research in Nursing & Health*, vol. 22, no. 5, pp. 399–409.

Dietrich Leurer, M. & Misskey, E. 2015, 'The psychosocial and emotional experience of breastfeeding: reflections of mothers', *Global Qualitative Nursing Research*, vol. 2, pp. 1–9.

Elo, S. & Kyngäs, H. 2008, 'The qualitative content analysis process', *Journal of Advanced Nursing*, vol. 62, no. 1, p. 107.

Fair, F.J., Watson, H., Gardner, R. & Soltani, H. 2018, 'Women's perspectives on antenatal breast expression: a cross-sectional survey', *Reproductive Health*, vol. 15, no. 1, p.58.

Filipe A, Renedo A & Marston C. 2017. 'The co-production of what? Knowledge, values, and social relations in health care', *PLOS Biology*, pp.1-6. https://doi.org/10.1371/journal.pbio.2001403

Forster, D.A., McEgan, K., Ford, R., Moorhead, A., Opie, G., Walker, S. & McNamara, C. 2011, 'Diabetes and antenatal milk expressing: a pilot project to inform the development of a randomised controlled trial', *Midwifery*, vol. 27, no. 2, pp. 209–14.

Forster, D.A., Moorhead, A.M., Jacobs, S.E., Davis, P.G., Walker, S.P., McEgan, K.M., Opie, G.F., Donath, S.M., Gold, L., McNamara, C., Aylward, A., East, C., Ford, R. & Amir, L.H. 2017, 'Advising women with diabetes in pregnancy to express breastmilk in late pregnancy (Diabetes and Antenatal Milk Expressing [DAME]): a multicentre, unblinded, randomised controlled trial', *The Lancet*, vol. 389, no. 10085, pp. 2204–13.

Fowler C, Lee A, Dunston R, Chiarella M, Rossiter C (2012), Co-producing parenting practice: learning how to do child and family health nursing differently. *Australian Journal of Child and Family Health Nursing* 9(1), 7-11.

Haroon, S., Das, J.K., Salam, R.A., Imdad, A. & Bhutta, Z.A. 2013, 'Breastfeeding promotion interventions and breastfeeding practices: a systematic review', *BMC Public Health*, vol. 13 Suppl. 3, p. S20.

Harris, P.A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N. & Conde, J.G. 2009, 'Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support', *Journal of Biomedical Informatics*, vol. 42, no. 2, pp. 377–81.

Heinig, M.J. & Dewey, K.G. 1996, 'Health advantages of breast feeding for infants: a critical review', *Nutrition Research Reviews*, vol. 9, no. 1, pp. 89–110.

Hesson A, Fowler C, Rossiter C & Schmied V. 2017, 'Lost and confused': parent representative groups' perspectives on child and family health services in Australia. *Australian Journal of Primary Health*, 560-566. https://doi.org/10.1071/PY17072.

Hoddinott, P., Lee, A.J. & Pill, R. 2006, 'Effectiveness of a breastfeeding peer coaching intervention in rural Scotland', *Birth*, vol. 33, no. 1, pp. 27–36.

Homer, C.S.E., Henry, K., Schmied, V., Kemp, L., Leap, N. & Briggs, C. 2009, ' "It looks good on paper": transitions of care between midwives and child and family health nurses in New South Wales', *Women & Birth*, vol. 22, no. 2, pp. 64–72.

Hopkinson, J. & Konefal Gallagher, M. 2009, 'Assignment to a hospital-based breastfeeding clinic and exclusive breastfeeding among immigrant Hispanic mothers: a randomized, controlled trial', *Journal of Human Lactation*, vol. 25, no. 3, pp. 287–96.

Horta, B.L., de Mola, C.L. & Victora, C.G. 2015, 'Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: systematic review and meta-analysis', *Acta Paediatr*, vol. 104, no. 467, pp. 30–7.

Illawarra Shoalhaven Local Health District 2014, *Guideline: antenatal expressing of breast milk (for women whose babies are likely to need supplementary feeds)*.

Kendall-Tackett, K., Cong, Z. & Hale, T.W. 2011, 'The effect of feeding method on sleep duration, maternal well-being and postpartum depression', *Clinical Lactation*, vol. 2–2, pp. 22–6

King, N. 2004, 'Using interview in qualitative research', in C. Cassell & G. Symon (eds), *Essential guide to qualitative methods in organizational research*, SAGE Publication, London, UK, pp. 11–22.

King, N. 2012, 'Doing template analysis', in G. Symon & C. Cassell (eds), *Qualitative organizational research: core methods and current challenges*, SAGE Publications, London, UK.

Kingston, D., Dennis, C.L. & Sword, W. 2007, 'Exploring breast-feeding self-efficacy', *Journal of Perinatal and Neonatal Nursing*, vol. 21, no. 3, pp. 207–15.

Korstjens, I. & Moser, A. 2017, 'Series: practical guidance to qualitative research. Part 4: Trustworthiness and publishing', *European Journal of General Practice*, vol. 24, pp. 120–4.

Kuper, A., Lingard, L. & Levinson, W. 2008, 'Critically appraising qualitative research', *British Medical Journal (International Edition)*, vol. 337, no. 7671, pp. 687–9.

Kurniawati, Rustina, Y. & Budiati, T. 2019, 'Peer support increases maternal confidence, kangaroo mother care implementation and weight gain in LBW infants', *Comprehensive Child & Adolescent Nursing*, vol. 42, no. sup1, pp. 252–60.

Lamba, S., Chopra, S. & Negi, M. 2016, ‘Effect of antenatal breast milk expression at term pregnancy to improve post natal lactational performance’, *Journal of Obstetrics and Gynaecology of India*, vol. 66, no. 1, pp. 30–4.

Lopes S, Titulaer P, Bokosi M, Homer C & Hoope-Bender P. 2015, 'The involvement of midwives associations in policy and planning about the midwifery workforce: A global survey', *Midwifery* 31, pp. 1096-1103.

McCann, M.F., Baydar, N. & Williams, R.L. 2007, ‘Breastfeeding attitudes and reported problems in a national sample of WIC participants’, *Journal of Human Lactation*, vol. 23, no. 4, pp. 314–24.

McCarter-Spaulding, D.E. & Kearney, M.H. 2001, ‘Parenting self-efficacy and perception of insufficient breast milk’, *Journal of Obstetric, Gynecologic & Neonatal Nursing*, vol. 30, no. 5, pp. 515–22.

McCrory, C. & Murray, A. 2013, ‘The effect of breastfeeding on neuro-development in infancy’, *Maternal & Child Health Journal*, vol. 17, no. 9, pp. 1680–8.

McInroy, L.B. 2016, 'Pitfalls, Potentials, and Ethics of Online Survey Research: LGBTQ and Other Marginalized and Hard-to-Access Youths', *Social Work Research*, vol. 40, no. 2, pp. 83-93.

McLeish J & Redshaw M. 2017, 'Mothers’ accounts of the impact on emotional wellbeing of organised peer support in pregnancy and early parenthood: a qualitative study', *BMC Pregnancy and Childbirth* 17:28 DOI 10.1186/s12884-017-1220-0.

Meldrum, S. & Simmer, K. 2016, 'Docosahexaenoic acid and neurodevelopmental outcomes of term infants', *Annals of Nutrition & Metabolism*, vol. 69, pp. 23–8.

Mizrak, B., Ozerdogan, N.P. & Colak, E.P. 2017, 'The effect of antenatal education on breastfeeding self-efficacy: primiparous women in Turkey', *International Journal of Caring Sciences*, vol. 10, no. 1, pp. 503–10.

National Health and Medical Research Council 2007, *The Australian Code for the Responsible Conduct of Research*, NHMRC, Canberra, <https://www.nhmrc.gov.au/research/responsible-conduct-research/summary-australian-code-responsible-conduct-research>.

National Health and Medical Research Council 2012a, *Eat for health: feeding guidelines, information for health workers*, NHMRC, Canberra, <https://www.eatforhealth.gov.au/sites/default/files/content/The%20Guidelines/170131_n56_infant_feeding_guidelines.pdf>.

National Health and Medical Research Council 2012b, *Literature review: infant feeding guidelines*, NHMRC, Canberra, <https://www.nhmrc.gov.au/sites/default/files/images/literature-review-infant-feeding-guidelines.pdf>.

National Health and Medical Research Council 2019, *Management of data and information in research: a guide supporting the Australian code for the responsible conduct of research*, NHMRC, Canberra, <https://www.nhmrc.gov.au/sites/default/files/documents/attachments/Management-of-Data-and-Information-in-Research.pdf>.

Newby, R., Davies, P. 2016, 'Why do women stop breast-feeding? Results from a contemporary prospective study in a cohort of Australian women', *European Journal of Clinical Nutrition* **70,** 1428–1432, <https://doi.org/10.1038/ejcn.2016.157>.

New South Wales Ministry of Health 2015, *NSW Mothers and babies 2015*, NSW Health, North Sydney, <file:///C:/Users/Junko/Desktop/NSW%20mothers-and-babies-2015.pdf>.

New South Wales Ministry of Health 2017, *Releasing time to care*, NSW Health, <https://www.health.nsw.gov.au/nursing/Pages/releasing-time-to-care.aspx>.

Nichols, J., Schutte, N.S., Brown, R., Dennis, C.-L. & Price, I. 2009, 'The impact of a self-efficacy intervention on short-term breast-feeding outcomes', *Health Education & Behavior*, vol. 36, no. 2, pp. 250–9.

Noble, H. & Smith, J. 2015, 'Issues of validity and reliability in qualitative research', *Evidence-Based Nursing*, vol. 18, no. 2, p. 34.

Nursing and Midwifery Board Australia 2018, *Midwife standards for practice*, <file:///C:/Users/Junko/Desktop/Nursing-and-Midwifery-Board---Professional-standards---Midwife-standards-for-practice---Effective-1-October-2018.PDF>.

Office of the Australian Information Commissioner 2018, *De-identification and the Privacy Act*, OAIC, <file:///C:/Users/Junko/Desktop/de-identification-and-the-privacy-act.pdf>.

Oscroft, R. 2001, 'Antenatal expression of colostrum', *Practising Midwife*, vol. 4, no. 4, pp. 32–5.

O'Sullivan, E.J., Alberdi, G., Scully, H., Kelly, N., Kincaid, R., Murtagh, R., Murray, S., McGuinness, D., Clive, A., Brosnan, M., Sheehy, L., Dunn, E. & McAuliffe, F.M. 2018, 'Antenatal breastfeeding self-efficacy and breastfeeding outcomes among mothers participating in a feasibility breastfeeding-support intervention', *Irish Journal of Medical Science*, vol. 188, no. 2, pp. 569–78.

O'Sullivan T, Cooke J, McCafferty C & Giglia R 2019 Online video instruction on hand expression of colostrum in pregnancy is an effective educational tool, *Nutrients,* 11, 883, doi:10.3390/nu11040883

Otsuka, K., Dennis, C.-L., Tatsuoka, H. & Jimba, M. 2008, 'The relationship between breastfeeding self-efficacy and perceived insufficient milk among Japanese mothers', *Journal of Obstetric, Gynecologic & Neonatal Nursing*, vol. 37, no. 5, pp. 546–55.

Otsuka, K., Taguri, M., Dennis, C.L., Wakutani, K., Awano, M., Yamaguchi, T. & Jimba, M. 2013, 'Effectiveness of a breastfeeding self-efficacy intervention: do hospital practices make a difference?', *Maternal & Child Health Journal*, vol. 18, no. 1, pp. 296–306.

Ottawa Hospital Research Institute & University of Oxford 2016, *Prisma transparent reporting of systematic reviews and meta-analyses*, OHRI, viewed 3 August 2016, <http://www.prisma-statement.org/>.

Parratt, J.A. & Fahy, K.M. 2011, 'A feminist critique of foundational nursing research and theory on transition to motherhood' *Midwivery*, vol.27, pp. 445-5.1

Persson, E.K., Fridlund, B., Kvist, L.J. & Dykes, A. 2011, 'Mothers' sense of security in the first postnatal week: interview study', *Journal of Advanced Nursing*, vol. 67, no. 1, pp. 105–16.

Rosen, I.M., Krueger, M.V., Carney, L.M. & Graham, J.A. 2008, 'Prenatal breastfeeding education and breastfeeding outcomes', *The American Journal of Maternal Child Nursing*, vol. 33, no. 5, pp. 315–9.

Regan S & Brown A (2019) Experiences of online breastfeeding support: Support and reassurance versus judgement and misinformation, Maternal and Child Nutrition 15(4) p.e12874-n/a DOI: 10.1111/mcn.12874.

Rothenberg, R.S. & Barrett, W.M. 1998, 'Multiple advantages of breastfeeding', *USA Today Magazine*, vol. 126, no. 2633, p. 15.

Sandall, J., Homer, C., Sadler, E., Rudisill, C., Bourgeault, I., Bewley, S., Cowie, L., Cooper, C. & Curry, N. 2011, *Staffing in maternity units: getting the right people in the right place at the right time*, research report, The King's Fund, London, UK.

Schmied, V., Mills, A., Kruske, S., Kemp, L., Fowler, C. & Homer, C. 2010, 'The nature and impact of collaboration and integrated service delivery for pregnant women, children and families', *Journal of Clinical Nursing*, vol. 19, no. 23–24, pp. 3516–26.

Schmied V, Homer C, Fowler C, Psalia K, Barclay L, Wilson I, Kemp L, Fasher M & Kruske S. 2015, 'Implementing a national approach to universal child and family health services in Australia: professionals' views of the challenges and opportunities'. *Health & Social Care in the Community* 23(2): 159-170.

Schwarzer, R. 2014, *Self-efficacy: thought control of action*, Routledge, Abingdon, UK.

Shenton, A.K. 2004, 'Strategies for ensuring trustworthiness in qualitative research projects', *Education for Information*, vol. 22, no. 2, pp. 63–75.

Simmons, V. 2002a, 'Exploring inconsistent breastfeeding advice: 1', *British Journal of Midwifery*, vol. 10, no. 5, pp. 297, 300–1.

Simmons, V. 2002b, 'Exploring inconsistent breastfeeding advice: 2', *British Journal of Midwifery*, vol. 10, no. 10, pp. 616–9.

Singh, G., Chouhan, R. & Sidhu, K. 2009, 'Effect of antenatal expression of breast milk at term in reducing breast feeding failures', *Medical Journal Armed Forces India*, vol. 65, no. 2, pp. 131–3.

Sinha, B., Chowdhury, R., Sankar, M.J., Martines, J., Taneja, S., Mazumder, S., Rollins, N., Bahl, R. & Bhandari, N. 2015, 'Interventions to improve breastfeeding outcomes: a systematic review and meta-analysis', *Acta Paediatrica*, vol. 104, no. 467, pp. 114–34.

Soltani, H. & Scott, A.M.S. 2012, 'Antenatal breast expression in women with diabetes: outcomes from a retrospective cohort study', *International Breastfeeding Journal*, vol. 7, no. 18.

Stillwell, S.B., Fineout-Overholt, E., Melnyk, B.M. & Williamson, K.M. 2010, 'Evidence-based practice, step by step: asking the clinical question: a key step in evidence-based practice', *American Journal of Nursing*, vol. 110, no. 3, pp. 58–61.

Svensson, J. 2015, ‘Antenatal breastfeeding education: strategies for midwives’, *Women and Birth*, vol. 28, p. S29.

Swartz, M.K. 2017, 'A Strength-Based Approach to Care', *Journal of Pediatric Healthcare*, vol. 31, no. 1, pp. 1-.

Symon, G. & Cassell, C. 2012, *Qualitative organizational research: core methods and current challenges*, SAGE Publications, London, UK.

Torraco, R. 2011, ‘Writing integrative literature review: guidelines and examples’, *Human Resource Development Review*, vol. 4, pp. 356–67.

Toy-Cronin B. 2018, 'Ethical issues in insider-outsider research', In The SAGE *Handbook of Qualitative Research Ethics*. R Iphofen & M Tolich, pp.455-469.

Tuthill, E.L., McGrath, J.M., Graber, M., Cusson, R.M. & Young, S.L. 2017, ‘Breastfeeding self-efficacy: a critical review of available instruments’, *Journal of Human Lactation*, vol. 32, no. 1, pp. 35–45.

United Nations Children’s Fund & World Health Organizaion 2018, *Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services: the revised Baby-friendly Hospital Initiative*, UNICEF & WHO, <http://apps.who.int/iris/bitstream/handle/10665/272943/9789241513807-eng.pdf?ua=1>.

Walker, M. 2017, *Breastfeeding management for the clinician*, 4th edn, Jones and Bartlett.

Ward, J.D. 2000, *At the crossroads of medicine, feminism and religion*, University of North Carolina Press, Chapel Hill, NC.

Wells, K.J., Thompson, N.J. & Kloeblen-Tarver, A.S. 2006, 'Development and psychometric testing of the prenatal breast-feeding self-efficacy scale', *American Journal of Health Behavior*, vol. 30, no. 2, pp. 177–87.

Whittemore, R. & Knaft, K. 2005, 'The integrative review: updated methodology', *Journal of Advanced Nursing*, vol. 52, pp. 546–53.

Wilhelm, S.L., Stepans, M.B., Hertzog, M., Rodehorst, T.K. & Gardner, P. 2006, 'Motivational interviewing to promote sustained breastfeeding', *Journal of Obstetric, Gynecologic & Neonatal Nursing*, vol. 35, no. 3, pp. 340–8.

Willumsen, J. 2013, *Breastfeeding education for increased breastfeeding duration*, World Health Organization, <https://www.who.int/elena/bbc/breastfeeding_education/en/>.

World Health Organization 2016, *Infant and young child feeding*, WHO, viewed 23 August 2017, <http://www.who.int/mediacentre/factsheets/fs342/en/>.

World Health Organization 2017a, *Infant and young child feeding: fact sheet*, WHO, <http://www.who.int/mediacentre/factsheets/fs342/en/>.

World Health Organization 2017b, *Maternal, newborn, child and adolescent health*, WHO, viewed 18 August, <http://www.who.int/maternal_child_adolescent/topics/child/nutrition/breastfeeding/en/>.

World Health Organization 2021, The World Health Organization's infant feeding recommendation, *The World Health Organization's infant feeding recommendation,* WHO, <https://www.who.int/nutrition/topics/infantfeeding_recommendation/en/>.

Wszolek, K. 2015, 'Hand expressing in pregnancy and colostrum harvesting—preparation for successful breastfeeding?', *British Journal of Midwifery*, vol. 23, no. 4, pp. 260–7.

Xu, F., Binns, C., Wu, J., Yihan, R., Zhao, Y. & Lee, A. 2007, 'Infant feeding practices in Xinjiang Uygur Autonomous Region, People's Republic of China', *Public Health Nutrition*, vol. 10, no. 2, pp. 198–202.