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EXPERIENCES OF EXCLUSIVELY EXPRESSING BREAST MILK FOR TERM
INFANTS: A QUALITATIVE ANALYSIS

by

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A Dissertation submitted to the Faculty of the Graduate School,

Marquette University,

in Partial Fulfillment of the Requirements for

the Degree of Doctor of Philosophy

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ABSTRACT
EXPERIENCES OF EXCLUSIVELY EXPRESSING BREAST MILK FOR TERM
INFANTS:
A QUALITATIVE ANALYSIS

Lisa A. Anders

Marquette University

Breast milk feeding has numerous benefits for women and infants. Although positive maternal experiences with breast milk feeding impacts exclusivity, duration, and maternal mental health, most research focuses on women feeding directly at the breast. Breast milk can also be expressed and bottle-fed to the infant. This practice is encouraged in instances of maternal-infant separation or in cases of prematurity. However, there is an increasing number of women electing to feed exclusively expressed breast milk to term infants rather than feed directly at the breast. Little is known about what constitutes a positive, or salutary breastfeeding, experience in this population. Therefore, the aim of this study was to explore women's experiences of exclusive expression. Narrative interviews were conducted to collect qualitative data from a purposive sample of 21 women practicing exclusive expression of breast milk. After thematic analysis, three themes: *Unseen and Unheard*, *Doing it My Way*, and *Getting into the Groove*, along with 8 subthemes: *Breast is Best*, *Missed Opportunities for Healthcare Provider Support*, *Fighting for it*, *What Works for Us*, *A Sense of Control*, *Preparation*, *Tricks of the Trade*, and *Making it Manageable* were identified. Despite challenges including a lack of support from healthcare providers, and a lack of acknowledgement as breastfeeding mothers, exclusive expression offered participants a method to continue breast milk feeding in a way they found to be satisfying. This study provides insight into experiences of exclusive expression. Societal pressure to feed from the breast may have negative emotional consequences for women electing to exclusively express breast milk. There is a need for more information and support for breast milk expression from healthcare providers along with a reframing of how breast milk feeding is discussed and promoted.

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Chapter 1 Introduction

Introduction

Breast milk provides the ideal nutrition for infants leading to better health outcomes for mothers and infants. Yet only a quarter of mothers in the U.S. provide breast milk exclusively to their infants for the first six months of life. Experiential factors that increase exclusivity and duration of breast milk feeding (BMF), such as maternal satisfaction, have been explored in women that feed breast milk directly at the breast (Direct Breast Feeding [DBF]). However, breast milk can be expressed and fed to infants in a bottle exclusively without feeding at the breast. Less is known about the experiences of women who feed exclusively expressed breast milk (Exclusively Expressed Breast Milk Feeding [EE-BMF]), and how those experiences shape women's perceptions of BMF and infant feeding decisions. This chapter will provide details on the benefits of breast milk, the importance of maternal satisfaction in improving rates of BMF, and the limitations of current definitions of breastfeeding. These topics provide necessary background information for understanding the significance of exploring the experiences of women who practice EE-BMF. This study will build upon existing knowledge surrounding BMF by addressing gaps related to the experiences of women who provide breast milk through exclusively expressing their milk.

Background

It has been well-established that infants who receive breast milk have improved health outcomes (American Academy of Pediatrics, 2012; Bibbins-Domingo et al., 2016; Binns et al., 2016). Cognitive benefits of breast milk can be seen in the first year of life.

Choi et al. (2018) studied 255 women and infants over the course of the first year of life and found that infants who were fed breast milk exclusively for four months had superior communication and social interactions at six and 12 months compared to infants not fed breast milk. Cognitive benefits continue throughout life as evidenced by higher performance on intelligence tests and higher educational attainment (Horta & Victora, 2013; Victora et al., 2015). Moreover, infants derive not only nutritional but many immunological benefits from the anti-infective components of breast milk (Riordan, 2016). This leads to lower incidence of respiratory infections, atopic disease, and gastrointestinal illness, and otitis media (Frank et al., 2019; Pattison et al., 2018; Saeed et al., 2020). In examination of the gut microbiome, infants receiving breast milk have been found to have higher levels of *Bifidobacterium* and *Lactobacillus* which have been found to be protective against pathogenic bacteria such as *Clostridium difficile* which is found in higher concentrations in formula-fed infants (Lu & Ni, 2015). Breast milk contains probiotic, or beneficial, bacteria along with human milk oligosaccharides, or prebiotics, that promote the growth of good bacteria. Both of these are passed to the infant to reduce the growth of pathogens (Riordan, 2016). Additionally, the main immunoglobulin that lines the mucosal tracts in humans, Secretory IgA, is passed from mother to infant through breast milk, contributing to important immunological defenses in the intestinal and respiratory tracts despite the deficiency of the infant's own IgA in the first few months of life (Riordan, 2016).

Long-term benefits include decreased risk of asthma (Dogaru et al., 2014; El-Heneidy et al., 2018), childhood obesity (Hess et al., 2015; Horta & Victora, 2013) and type 2 diabetes (Horta & Victora, 2013; Lu & Ni, 2015; World Health Organization

[WHO], 2018). While difficult to parse out the effects of breastfeeding on obesity as maternal and socioeconomic factors can have strong influence, researchers have found that children who were breastfed had better dietary intake at six years of age after controlling for these factors (Perrine et al., 2014) and emerging theories point to changes to the gut microbiome that influence metabolism as a possible mechanism for breast milk's protective effects (Lu & Ni, 2015).

For low-birthweight and preterm infants, breast milk is crucial for improving infant mortality outcomes. Necrotizing enterocolitis (NEC) is a key contributor to mortality among premature infants. Infants receiving breast milk in the Neonatal Intensive Care Unit (NICU) have lower incidence and decreased mortality rates from NEC, perhaps due to higher levels of *Bifidobacterium* in the infant gut microbiome which has been found to be protective against NEC (Lu & Ni, 2015). Moreover, Hair et al. (2016) also observed reduced rates of retinopathy of prematurity, sepsis, and bronchopulmonary dysplasia, and ventilator days in a large, multisite study of premature, very low birthweight and extremely low birthweight infants who received an exclusively human milk-based diet compared to infants that received a cow-based diet.

Women receive health benefits from providing breast milk. Researchers have demonstrated decreased risks of endometrial and breast cancers in women who have provided breast milk (González-Jiménez et al., 2014; Jordan et al., 2017). There are also consistent findings that breastfeeding is protective against cardiovascular disease. In 2009, Schwarz et al. (2009) used data from the Women's Health Initiative Study to examine the effects of breastfeeding on a large sample (n=139,681) of postmenopausal women. Compared to those that had never breastfed, women who breastfed for 12

months had lower odds of hypertension, hyperlipidemia, diabetes, and cardiovascular disease. More recently, Rajaei et al. (2019) had similar findings. They compared the coronary artery risk of nulliparous women to parous women who had provided breast milk for at least five months and parous women who had not provided breast milk or did so for less than five months. Providing breast milk for longer than five months was the factor that differentiated the risk between nulliparous and parous women. Women who had provided breast milk for at least five months had lower risk of coronary artery disease compared to nulliparous women. Parous women who had never provided breast milk or had for less than five months had increased risk of coronary artery disease compared to the nulliparous group. Bonifacino et al. (2018) conducted a systematic review and found that breastfeeding for at least one month led to decreased blood pressure. The findings from these studies are significant to women's health as cardiovascular disease is the leading cause of death among women (Centers for Disease Control and Prevention, 2020). There is also evidence supporting a strong association between breastfeeding and lowered risk of developing type 2 diabetes (Aune et al., 2014) and differences in endocrine markers that signal risk for diabetes measured at three years postpartum (Stuebe et al., 2011). There is also data to support protective effects of breastfeeding against postpartum depression (Hamdan & Tamim, 2012) and lower levels of general perceived stress in breastfeeding women compared to formula-feeding women (Groër, 2005).

In the United States, high rates of breastfeeding provide economic and environmental benefits. Economic advantages exist at both the micro- and macroeconomic levels. An analysis in 2011 stated that the average annual cost of infant

formula was \$1,577 (Bartick, 2011) and later analyses showed substantial indirect costs to families due to missed work from child illnesses or healthcare costs that could be reduced with breastfeeding (Bartick et al., 2017; Santacruz-Salas et al., 2019). Assuming an increase in breastfeeding to a rate of 90% meeting recommendations, estimates of nationwide healthcare savings costs have been as high as \$3 billion in the U.S. (Bartick et al., 2017). Additionally, as climate change concerns continue to increase, it is important to consider the environmental impacts of manufacturing infant formula and breast milk as a more sustainable resource (WHO, 2018).

Exclusivity and duration

Many of the benefits of breastfeeding are dose-dependent, meaning that the longer and more exclusively the infant is fed breast milk, the greater the benefit. Exclusive BMF means that the infant receives only breast milk with no other supplementary fluids (e.g., water, juice, infant formula) or foods. Exclusivity for the first six months of life is recommended, after which complementary foods should be added to the diet. Breast milk remains a major source of nutrition until 12 months of age and continues providing benefits with even longer durations. Infants exclusively fed breastmilk until three months had better neural development in one study (Herba et al., 2013) and lower levels of total cholesterol and low-density lipids during adolescence in another (Hui et al., 2019) when compared with those fed only formula. Moodley-Govender et al. (2015) also found that higher levels of breast milk exclusivity were associated with decreased levels of biomarkers linked to gut inflammation. Experts agree that the maximum health benefits of BMF are achieved by combining both exclusive

BMF for a duration six-months and continuing BMF with complementary foods for two years and beyond (WHO, 2002).

The American Academy of Pediatrics (2012) released a policy statement recommending exclusive breastfeeding for six months. The organization regards breastfeeding as a public health issue rather than a lifestyle choice and stresses the importance of pediatrician training to play roles as breastfeeding advocates and educators. The American College of Obstetricians and Gynecologists (2018) also follows this recommendation and urges providers to support the informed decision-making of women regarding breastfeeding along the spectrum of perinatal care and in the community. In its position statement on breastfeeding, the Association of Women's Health, Obstetric, and Neonatal Nurses [AWHONN] (2015), draws attention to the importance of the nursing profession's role in providing education, support, and encouragement to women to improve breast milk feeding rates. All these organizations endorse public policies and public health efforts to increase breastfeeding rates for exclusivity and duration.

Additionally, U.S. governmental agencies have put forth efforts to encourage breastfeeding. The U.S. Department of Health and Human Services [USDHHS] (n.d.) includes objectives to increase breastfeeding rates and exclusivity within *Healthy People 2020*. Objectives included goals for increasing breastfeeding initiation to 81.9%, breastfeeding at 6 months to 60.6%, and exclusive breastfeeding to 25.5%, up from 76.7%, 47.5%, and 17.2% respectively in 2010 (Anstey et al., 2016). To support these objectives, the Office of the Surgeon General released the *Call to Action to Support Breastfeeding in 2011* which detailed 20 action steps across six areas: *Mothers and Their*

Families, Communities, Health Care, Employment, Research and Surveillance, and Public Health Infrastructure (USDHHS, 2011).

In the years since the publication of the action steps, various federal efforts have been implemented to enact change in BMF rates. Government agencies such as the Office on Women's Health and the Office of the Assistant Secretary for Preparedness and Response have developed breastfeeding guides complete with suggestions and illustrations for educating and supporting the public and utilized social media outlets (i.e., Twitter chats) to disseminate information (Anstey et al., 2016). Additionally, updated training for WIC counselors developed by the Office of Women's Health have provided documents that offers information and suggests solutions that allow employers to be more supportive of BMF (Anstey et al., 2016). Laws have been enacted to address maternal employment as a barrier to exclusive BMF. With 59.9% of mothers of children under the age of one year participating in the labor force in 2019 (Bureau of Labor and Statistics, 2020) the Breaktime for Nursing Mothers provision of the Fair Labor Standards Act as part of the Patient Protection and Affordable Care Act ("Patient Protection and Affordable Care Act," 2010) was aimed at increasing the ability for women to continue to provide milk for their infants after returning to work.

Globally, the World Health Organization [WHO] (2002) acknowledges the importance of breast milk feeding as the best food source for infants and its role in the reproductive processes of women. The organization recommends BMF to two years and beyond with the addition of complementary foods after six months of age. The global target set by the WHO for exclusive breastfeeding is to increase the proportion of infants between 0 and 6 months of age to 50%, but progress has been slow (WHO, 2014). In

2018, along with the United Nations Children’s Fund, the WHO re-evaluated and revised the *10 Steps for Successful Breastfeeding* and implementation guidelines of the Baby Friendly Hospital Initiative (BFHI), a program to promote better support of BMF that began in 1991 (WHO, 2018). The revisions are based on reviews of the available evidence for each step, signaling the importance of continuing evaluation to provide optimal support.

The U.S. has supported endeavors to increase the number of Baby Friendly facilities through funding from the Centers for Disease Control and Prevention (Anstey et al., 2016). Studies have shown improved breast milk feeding outcomes when BFH practices are followed (Jung et al., 2019; Patterson et al., 2019; Spaeth et al., 2018). Only 10% of births worldwide occurred in BFHI designated facilities in 2018 (WHO, 2018). While the BFHI has had considerable growth in recent years in the U.S., still only 29% of births took place in occurring BFH designated facilities in 2020 (Baby Friendly USA, 2020). With births occurring in over 5,000 hospitals in the U.S. (American Hospital Association, 2020), these 604 BFH facilities comprise only 12%, making access to this care scarce.

While Baby Friendly practices in hospitals have been used to promote breastfeeding, out-of-hospital birth is another practice that has been found to be associated with increased rates of exclusive breast milk feeding. In the United Kingdom and Ireland, a cross-sectional survey study of over 28,000 mother-infant pairs showed that home birth was associated with increased odds of breast milk feeding exclusively at six months (Quigley et al., 2016). In the U.S., only 1-2% of births occur out of a hospital setting (CDC, 2014). Cheyney et al. (2014) used data available on 16,924 women who

planned a home-birth between 2004 and 2009 and found that in this sample, 86% were exclusively breastfeeding at 6 weeks postpartum. Both Baby Friendly practices and out-of-hospital births can improve BMF rates, yet neither are readily available in the United States.

Factors Influencing Exclusive Breast Milk Feeding

Nationally, 25% of women exclusively feed breast milk at 6-months, down from 47% at 3-months (CDC, 2018). Although 25% exclusivity meets *Healthy People 2020* breastfeeding objectives (USDHHS, n.d.), it is low considering exclusive BMF for the first six-months of life is a national and global standard. The downward trend from 47% at 3-months to 25% at six months suggests that there are factors associated with cessation of exclusive BMF or any BMF cessation prior to national and global recommendations. Moreover, national breastfeeding statistics do not differentiate breast milk feeding rates by method of feeding. Breast milk feeding can occur directly at the breast or via expressed breast milk that is bottle-fed to the infant. This lack of specificity in reporting limits conclusions that can be drawn regarding factors impacting breast milk feeding.

Researchers have identified structural and intrinsic factors that women encounter that either prevent or facilitate exclusive breast milk feeding. A structural factor outside of the control of many women is the need to return to work shortly after giving birth. Intrinsically, perceived insufficient milk supply, pain, and breast milk feeding problems can also serve as barriers to BMF (Bai et al., 2015; Balogun et al., 2015; Gatti, 2008; Phillips, 2011). Other intrinsic factors can also predict BMF feeding behavior. A mother's intention to exclusively breastfeed and her breastfeeding self-efficacy are both

strongly associated with actual feeding behavior (Bai et al., 2009; Bowman, 2013; Brockway et al., 2017; Cooke et al., 2003; Tenfelde et al., 2011).

Breastfeeding Self-Efficacy

Breastfeeding Self-efficacy (BSE), defined as the confidence one has in their ability to breastfeed, has been shown to be a strong predictor of infant feeding behaviors (Brockway et al., 2017; Martinez-Brockman et al., 2017). Despite the strong predictive validity of BSE for exclusive BMF for shorter durations, in a review of the literature, Bai et al. (2019) revealed that few studies have examined associations for exclusivity at six months (Bai et al., 2019). Furthermore there continues to be a gap between BMF intention and BMF exclusivity through six months (Martinez-Brockman et al., 2017). Chan et al. (2016) found that an educational intervention resulted in higher BSE and higher rates of exclusive BMF at six months compared to controls, yet the rate of exclusive BMF in the intervention group was 11%. Martinez-Brockman et al. (2017) defined different types of self-efficacy. They delineated between the confidence in one's ability to breastfeed and confidence in one's ability to continue breastfeeding despite barriers. By examining these separately, they found that self-efficacy regarding ability to continue despite barriers was one of the strongest predictors exclusive BMF. The inability of BSE and intentions to explain low exclusivity signals the need for further examination of factors contributing to this intention-behavior gap.

Maternal Breastfeeding Satisfaction

A lesser-explored psychological factor impacting breast milk feeding is maternal satisfaction. Some women are motivated to start providing breast milk due to health

benefits for their infants, but this motivation decreases over time (Kestler-Peleg et al. 2015). People are more likely to sustain other types of health behaviors (e.g., physical activity) despite barriers if the behavior itself is inherently satisfying and enjoyable, giving them intrinsic motivation to continue (Teixeira et al., 2012). It follows that a satisfying and enjoyable experience of providing breast milk would be motivation to continue exclusive BMF. Indeed, low levels of breastfeeding satisfaction have been associated with greater likelihood of early weaning. Thus, researchers called for a greater understanding of individual experiences (Cooke et al., 2003).

The Maternal Breastfeeding Evaluation Scale (MBFES) was developed to measure facets of the maternal experience of breastfeeding included the construct of maternal breastfeeding satisfaction (Leff, Gagne, et al., 1994; Leff, Jefferis, et al., 1994). In the initial study, high levels of satisfaction were found to be predictive of BMF duration with a correlation of 0.48 ($p < 0.001$) among women in the U.S. (Leff, Jefferis, et al., 1994). Cooke et al. (2003) also found that Australian women whose MBFES scores falling in the lowest third were at greater risk of discontinuing any BMF at 2 weeks, 2 to 6 weeks, and 6 weeks to 3 months. The validity of the MBES in predicting exclusive BMF behavior was shown while validating the scale in Japanese population. Hiroko et al. (2017) conducted a study of Japanese women to determine if the MBFES predicted exclusive BMF behavior. Higher scores on the MBFES were associated with exclusive breastfeeding at five months. It is possible that maternal satisfaction, could help lessen the gap between intentions and self-efficacy with longer duration of exclusive breastfeeding. However, studies of maternal breastfeeding satisfaction have failed to incorporate the perspectives of women who EE-BMF. The concept of satisfaction

measured by the MBFES is also based on successful experiences of women. It focuses on a balance between the mother and infant while contextual aspects (e.g., return to work, familial relationships, information needs, decision-making support) that could impact how women who EE-BMF are overlooked. Therefore, a more holistic view of women's experiences, whether positive or negative, can shed light on how experience impacts duration and exclusivity.

It is difficult to generalize these findings related to exclusivity and maternal breastfeeding satisfaction because studies have varied definitions of breastfeeding and do not acknowledge different methods of providing breast milk (direct breastfeeding versus expression). Existing scales measuring breastfeeding satisfaction, enjoyment, and motivation include language directed towards women that feed at breast and have not been validated or used to explore these relationships with exclusivity in women who exclusively express (Kestler-Peleg et al., 2015; Leff, Jefferis, et al., 1994).

Expressed Breast Milk Feeding

Expressed BMF has been widely studied and encouraged in cases of infant prematurity or maternal infant illness when direct breastfeeding is not possible (AWHONN, 2015; Eglash & Malloy, 2015; Flaherman & Lee, 2013; Ryan et al., 2013; Spatz & Edwards, 2016). Additionally, many women with healthy, term infants feed expressed breast milk at some point during their BMF period. Documented rates of breast milk expression in combination with direct breastfeeding range from 63% in the first month postpartum (Geraghty et al., 2012) to 85% between 1.5 and 4.5 months (Labiner-Wolfe et al., 2008). Loewenberg Weisband et al. (2017) found that 98% of their sample (n=100) planned to express at some point.

Globally, data show that there is an increasing number of women who practice exclusively expressed breast milk feeding (EE-BMF), also called exclusive expression or exclusive pumping, for their healthy, term infants. Yet, quantitative data on women in the U.S. who exclusively feed expressed milk for healthy, term infants are limited as national surveillance questionnaires lack specificity on feeding methods and proportion of feeds at breast vs. via expressed breast milk. Additionally, data that is available in the U.S. on expression has been limited to predominantly white, highly educated samples of women. Globally, rates as high as 22.6% of mothers have been found in China (Jiang et al., 2015) and 16.5% in Singapore (Pang et al., 2017), with other countries seeing considerable increases in rates in recent years (Bai et al., 2017; Binns et al., 2006). Few studies have examined the practice of exclusive expression specifically for term infants, and there are contradictory findings about the effects of milk expression on duration and exclusivity. However, some data available suggests that exclusive breast milk expression leads to early breastfeeding cessation (Bai et al., 2017; Geraghty et al., 2012; Jiang et al., 2015).

One factor that negatively impacts EE-BMF duration in these breastfeeding women is dissatisfaction (Clemons & Amir, 2010). Studies exploring the experience of EE-BMF has been limited to mothers of preterm leading to a scarcity in research examining the experiences of women who EE-BMF for term infants including women of color. Survey data has provided some evidence about challenges, adverse reactions to breast pumps, and prevalence but there is a paucity of explorations of the full experience from the perspectives of these women.

Breastfeeding Definitions

There are two prevailing methods for defining and classifying levels of breastfeeding in research. WHO (WHO, 2008) defines five classifications of breastfeeding listed in Table 1. The Interagency Group for Action on Breastfeeding [IGAB] developed different definitions that have been in use since 1990 (Labbock & Krasovec, 1990). These can be found in Table 2.

Table 1

WHO Breastfeeding Classifications

Classification	Definition
Exclusive breastfeeding	Infant receiving breast milk ^a only. Infants may also receive oral rehydration solutions, drops, or syrups (e.g., vitamins, minerals, medicines)
Predominant breastfeeding	Breast milk ^a as the predominant source of nourishment. Liquids such as water, water-based drinks, or fruit juice are also allowed
Complementary feeding	Breast milk ^a and solid or semi-solid foods and any other liquid
Breastfeeding	Breast milk ^a and any food or liquid
Bottle-feeding	Any liquid (including breast milk ^a) or semi-solid food from a bottle with nipple/teat and any food or liquid

Note. Table adapted from publication by World Health Organization (WHO, 2008)

^a Breast milk includes expressed milk or from a wet nurse

Table 2*IGAB Breastfeeding Classifications*

Classification	Definition
Full breastfeeding	Exclusive breast milk ^a with no other liquids, or almost exclusive breast milk with the inclusion of vitamins water, or ritualistic fluids given infrequently
Partial breastfeeding	Breast milk ^a consists of a high, medium, or low proportion of infant intake
Token breastfeeding	The breast is used primarily for comfort and not for nutritive purposes

Note. Table adapted from Labbock and Krasovec (1990)

^aBreast milk includes expressed milk

As noted in Table 1, breast milk feeding is included in the bottle-feeding category in the WHO classification system, and within each IGAB classification in Table 2, the various levels of proportion of feeds included breast milk. Therefore, these categories lack precision for researchers and participants to report breastfeeding practices (Wood & Woods, 2018). Without an option in either classification system to report EE-BMF as a feeding practice, these definitions do not represent the realities of the multiple modalities of infant feeding used by women. Therefore, researchers have recently called for further classification of breastfeeding to delineate feeding at breast from expressed breast milk feeding to better understand BMF and its outcomes (Felice et al., 2016; Noel-Weiss et al., 2014; O’Sullivan & Rasmussen, 2017; Rasmussen et al., 2017).

Even within the body of literature on breast milk expression, there has been a lack of consistency in the meaning of “exclusive expression.” Some researchers use the term “exclusivity” in reference to the method of breast milk provision but do not distinguish between exclusive breast milk and combination with formula (i.e., a woman feeding both

formula and breast milk, with the breast milk being fed exclusively from a bottle). Others use the term “exclusive” to refer to the type of milk only and therefore refer to women who express who may also feed directly at breast. There are women who exclusively feed breast milk via exclusive expression, and therefore their experiences are not fully captured in either of the prior definitions. This lack of clear operational definitions presents a challenge for research including synthesizing findings on studies of breast milk expression.

Societal interpretations traditionally equate the term breastfeeding with an action taking place at the breast. Popular books about breast milk feeding for women refer to breastfeeding as “nursing” and descriptions refer to “weaning” as the act of removing the infant from direct breastfeeding which ignores women who “wean” from a pump. In the introductory sections of *The Womanly Art of Breastfeeding* (Wiessinger et al., 2010), the process of direct breastfeeding is compared to feeding breast milk in a bottle. The authors emphasize the importance of closeness, connection, and the relationship occurring during the act of direct that makes it not only a feeding method but “a way of mothering” (p.xxi). While the most recent edition of *The Nursing Mother’s Companion: The Breastfeeding Book Mothers Trust, from Pregnancy Through Weaning* (Huggins, 2017) contains revisions that address breast pumps, it can be seen that expressing milk is not covered until page 224. The emphasis on feeding directly at the breast in popular books do not reflect the realities of women who provide breast milk in other ways. The promotion of “breast is best” also may lead some women to question their feeding choices if their milk is in a bottle. Research is needed to explore how these societal views of breast milk feeding have impacts on the experiences of mothers who EE-BMF.

Statement of the Problem

Due to the health benefits of breast milk feeding for both women and infants, it is imperative that more women exclusively feed breast milk for six months. Nationally, rates for exclusivity tend to decrease over time. Seventy-five percent of women who initiated exclusive breastfeeding do not continue to do so at 6-months after delivery. Therefore, research is needed to identify women's goals, factors involved in their decision-making processes related to infant feeding, and barriers which may play a role in achieving desired goals. Furthermore, national breastfeeding statistics omit breastfeeding method in general and breast milk expression specifically, which may impact exclusivity and duration rates. Women who exclusively express breast milk are at greater risk for early weaning of exclusive BMF. The proportion of women who practice EE-BMF appears to be growing. Societal definitions of breastfeeding and increased pressures to breastfeed, feelings of shame, guilt, and stress have been conveyed by women who are unable to breastfeed directly at the breast and feed only expressed milk in a society where breastfeeding is equated with being a good mother (Diez-Sampedro et al., 2019; Johnson, et al., 2013; Lindau et al., 2015). Providers must be ready to provide infant feeding information to women to assist in making informed infant feeding decisions. When a woman has intentions to provide breast milk, including those who practice EE-BMF, providers must be supportive of her method and be able to help when methods change over time. The experiences, goals, and feelings of these women need to be explored to better provide that support.

Factors, specifically maternal breastfeeding satisfaction, related to breastfeeding exclusivity in the traditional sense have been explored; yet there is a paucity of research

on factors related to exclusivity among women who EE-BMF. Women who use EE-BMF may have a variety of reasons and motivations that lead to exclusive expression. Some may have intentionally chosen this method while others may have initially intended to feed milk directly at the breast. For others, exclusivity may not be part of the goal or decision-making process relating to their infant feeding. Therefore, research exploring the experiences, satisfaction, and goals of women who practice EE-BMF is warranted.

Purpose of the Study

The purposes of this study will be: (a) to explore the experiences of women who practice EE-BMF, (b) to examine the feeding goals and intentions of women who practice EE-BMF, and (c) determine whether evidence of salutary breastfeeding is present in the experiences of women who practice EE-BMF.

Significance

Breastfeeding support from healthcare professionals, specifically nurses, regardless of feeding method is crucial to improving breastfeeding rates in the U.S. Bringing awareness of the experiences of women who practice EE-BMF will assist in helping healthcare providers become more knowledgeable about this growing population. Women have reported lack of support and feelings of tension when professionals had differing goals for breastfeeding than mothers (Hoddinott & Pill, 2000). This study will enable providers to view EE-BMF from a more woman-centered perspective and acknowledge the validity of the mother's feeding method.

Breastfeeding women report a lack of adequate information or conflicting information regarding breastfeeding (Fox et al., 2015) especially related to breast milk

expression (BME) (Flaherman et al., 2016) leaving them feeling unprepared. Furthermore, findings from a recent cross-sectional survey demonstrate that among women who EE-BMF received little information about expressing prenatally and had subsequent feelings of frustration and disappointment in their experience (Jardine, 2019). This may shed light on the negative association between receiving breast pump information from a healthcare provider and breastfeeding duration found by Chen et al. (2012) in contrast to positive associations with receiving that information from friends or family. The authors point out that this signals the need for more adequate training for healthcare professionals and nurses regarding breast pump use and women's experiences with infant feeding.

In nursing research, this study is important for development of interventions to better support women who practice EE-BMF. Through an understanding of the relationships between intentions, maternal satisfaction, and breastfeeding exclusivity and duration, nurse researchers can build upon this work to develop appropriate supportive interventions and measurements for these variables. Current measurement tools do not provide language inclusive of diverse feeding methods. Findings from this study can help in determining how current scales can be modified or revised to include constructs specific to women who exclusively express.

Assumptions

The following assumptions were made when conducting this study: (1) Women who used EE-BMF would openly share their experiences regarding infant feeding, (2) Using social media for recruitment, a sample with diverse characteristics (e.g., race, ethnicity, socioeconomic status, age, etc.) would be available and willing to participate

(3) Purposively obtaining a sample with maximum variation would lead to a holistic view of the experience and allow for comparison between groups of women who intended to EE-BMF and those who intended to use a different infant feeding method but came to practice EE-BMF, (4) Qualitative methods would provide in depth details of women's experiences that would contain information related to satisfaction, intentions, and breastfeeding outcomes, and (5) A Feminist philosophical approach is appropriate for this population of women whose voices have not been highlighted in breastfeeding research.

Limitations

The following expected limitations were taken into account in the design of this study: (1) Detailed accounts would be limited by participant recall, (2) the results of this study may not be generalizable to all women who practice EE-BMF due to variation in contexts that lead to differing experiences and a small sample, (3) interpretation of findings could be influenced by the background, beliefs, and personal experiences of the researcher due to the nature of knowledge creation within the constructivist paradigm, and (4) it is possible that participants may perceive stigmatization surrounding their chosen feeding method which could limit full disclosure of their experiences.

Delimitations

This study focused on the experiences of only women who practiced EE-BMF for healthy, term infants. The WHO definition of exclusive breastfeeding (infant receiving breast milk only with the exception of oral rehydration solutions, drops, or syrups (e.g., vitamins, minerals, medicines) was used and women who exclusively fed their own

expressed milk were recruited for participation. This study did not investigate the experiences of women who use donor breast milk.

Conclusion

Evidence to support the provision of only breast milk for term infants is substantial. Yet most women in the United States do not exclusively feed breast milk for the recommended six months. Women who practice EE-BMF feed breast milk for shorter periods of time compared to those that feed at breast or practice a combination of methods. Various factors related to early cessation including maternal satisfaction have been explored in DBF women leading to interventions to provide better support and improve rates. However, due to a poor operationalization of the term exclusive breastfeeding, there is a scarcity of research on maternal breastfeeding satisfaction among the growing population of women that EE-BMF. Therefore, assumptions of effective support and interventions that have been successful in women who feed at breast might be inappropriate.

The experience of feeding EE-BMF may be different than feeding at the breast; therefore, women may report different factors that contribute to a satisfying experience. For example, Felice et al. (2016) studied a group of women and classified their reasons for expressing as either elective or nonelective. Women who expressed for nonelective reasons did not choose expressing, but rather felt that they had to to continue providing breast milk when faced with challenges to breastfeeding. However, these women who expressed for nonelective reasons discontinued any BMF earlier than those that intended to express for elective reasons. These women may have felt dissatisfied by not feeling as though they had a choice. Yet, the term satisfaction may not be fully inclusive of the

factors that support a fully positive infant feeding experience leading to better breastfeeding outcomes.

The Situation Specific Theory of Breastfeeding is a theory that recognizes the holistic experience of infant feeding and acknowledges the many factors that contribute to a positive experience which is termed salutary breastfeeding. Feelings of satisfaction, making an informed choice, and a balance between maternal and infant needs are some of the criteria for a salutary breastfeeding experience (Nelson, 2006). As it is hypothesized that a salutary breastfeeding experience will lead to longer, more exclusive breastfeeding and higher rates of breast milk feeding, it is important to determine whether there is evidence of salutary breastfeeding criteria in the experiences of women who practice EE-BMF. This study will provide a better understanding of the experience of exclusively expressing women. In turn, nurses will be able to better support and improve maternal satisfaction and thus a salutary breastfeeding experience leading to improved breastfeeding rates.

Chapter 2 Literature Review

To better understand factors associated with breast milk expression, an in-depth literature review was done to identify what is known regarding the experience, prevalence, and impacts of breast milk expression (BME) on exclusivity and duration and identify gaps. The population of interest for this study is women who practice exclusively expressed breast milk feeding (EE-BMF) for healthy, term infants and therefore articles with aims focused on special needs populations (e.g., NICU, congenital defects, medical conditions) or contained samples of predominantly mothers of preterm infants were excluded. The theoretical framework, The Situation-Specific Theory of Breastfeeding, is also extensively described to better describe the relationships between the theoretical constructs and the concepts explored in this study.

Data for this literature review were collected using four databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Web of Science, and PsycInfo. Keywords used for the search were: breastfeeding, breast pump, breast expression, breast milk expression, and satisfaction. The review was limited to peer-reviewed research published in English. The Patient Protection and Affordable Care Act was passed in 2010 and made breast pumps and breaktime for nursing mothers more accessible ("Patient Protection and Affordable Care Act," 2010), thereby increasing the ability to express milk among women in the United States. To show trends leading up to this policy change and broaden the scope of the review, the search was expanded to the previous decade to include research articles published between 2000 and 2020. Opinion, commentary, and clinical guidelines articles were excluded. Systematic reviews were used to find original sources but were not included themselves unless they contained

meta-analyses. After initial article retrieval and review, an ancestral search was also performed. Articles were included if the sample included mothers who had expressed any breast milk or had practiced exclusive expression. After application of inclusion and exclusion criteria, 36 articles remained for analysis.

The literature was categorized by research focus as they related to either breast milk expression or satisfaction. The results of the analysis will be organized and presented in the following order: a general description of the body of literature as a whole and its characteristics, followed by research related to breast milk expression, next an overview of the theoretical framework and its relation to this literature, and finally a critical review of the limitations and gaps in the literature. The review will conclude with a description of how this study will address gaps found in the literature.

Results

The literature on BME for term infants is small compared to literature on breastfeeding in general or BME for special populations such as preterm or ill infants. Therefore, articles pertaining to any BME were included along with EE-BMF. Furthermore, the definition of EE-BMF found in these articles included mothers who were supplementing with formula but feeding all breast milk as expressed milk. Only two studies differentiated between those mothers who exclusively fed breast milk that was exclusively expressed from those who fed all breast milk as expressed but with formula supplementation (Jiang et al., 2015; Pang et al., 2017). Rasmussen et al. (2017) suggested clarifying not only the method of breast milk feeding, but also the proportion of feeds that are breast milk as opposed to formula. Therefore, when studies reported on both methods of feeding and exclusivity of BMF, I used the terms in Table 3 to differentiate between

methods and proportions. I developed these terms as a way to provide clarity when synthesizing findings from studies that may use differing terminology.

Table 3

Terms to Describe Methods and Proportions of Breast Milk Feeding

Term	Acronym	Definition
Exclusively Expressed- Exclusive Breast Milk Feeding	EE-EBMF	Infant receiving only breast milk, all breast milk is expressed milk
Exclusively Expressed- Partial Breast Milk Feeding	EE-PBMF	Infant receiving breast milk and other foods or supplementary milks (i.e., formula), all breast milk is expressed milk
Exclusively Expressed-Any Breast Milk Feeding	EE-ABMF	Proportion of breast milk feeding not specified, all breast milk is expressed milk
Partially Expressed – Exclusive Breast Milk Feeding	PE-EBMF	Infant receiving only breast milk, breast milk is fed a combination of expressed breast milk and at- breast feeds
Partially Expressed -Partial Breast Milk Feeding	PE-PBMF	Infant receiving breast milk and other foods or supplementary milks (i.e. formula), breast milk is fed as a combination of expressed milk and at breast feeds

There were 36 studies related to breast milk expression of which researchers in 25 utilized quantitative (Table 4) and in 11 employed qualitative methodologies (Table 5).

After reviewing the studies, four categories emerged: *Prevalence and Patterns of Expression, Impacts on Exclusivity and duration, Experiences of Expression, and Factors*

Related to Expression. Most of the articles related to the experience of expression were qualitative with quantitative research dominating the remaining three categories.

Table 4*Quantitative Research Studies on Breast Milk Expression*

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
Category: Prevalence and Patterns of Expression				
Dorothy Li Bai et al. (2017) Hong Kong	Prospective Cohort	n=2450 Majority \geq HS education, high income	Proportion of expressed BMF Duration of any BMF	Selection bias Potential for recall bias Potential misclassification due to measurement of proportion of feeds rather than volume Did not differentiate between EE-EBMF and EE-ABMF
Binns et al. (2006) Australia	Secondary Analysis (PIFS I and PIFS II)	n=1143 Majority \leq HS education, Australian born	Proportion of BMF mothers Proportion of mothers who express Frequency of reasons for expressing	Selection bias
Clemons and Amir (2010) Australia	Cross-sectional Survey	n=903 Majority \geq HS education, married, Australian born	Frequency of expressing Proportions of mothers who express Frequency of Expression Reasons for Expression Proportion full and partial BMF Methods of expressing Sources of expression information	Selection bias Lack of specificity in frequency of expression (e.g., "several times per day" vs actual number)
Demirci and Bogen	Prospective longitudinal	n=61 Majority \geq HS	Proportion of daily direct and expressed BMF	Selection bias High attrition rate

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
(2017) USA		education, white, married	Breastfeeding attitude on Iowa Infant Feeding Attitude Scale	Large amount of missing data
Geraghty et al. (2012) USA	Prospective longitudinal	n=59 Majority \geq HS education, white, married	Usual method of BMF Exclusivity of BMF Feeding-related issues BMF feeding intentions	Selection bias Potential for misclassification of feeding method due to participant interpretation of “usual” feeding method
Geraghty et al. (2013) USA	Retrospective Cohort	n=40 (Characteristics not available)	Number of days of BMF Number of days fed only at breast and receiving any expressed milk Proportion of infants receiving any expressed milk	Selection bias Small sample size
Geraghty et al. (2005) USA	Retrospective Cross- Sectional	n=346 Majority married, white, income >\$50k/year	Proportion of mothers expressing during first six months Proportion of BMF vs. formula feeds Methods of BMF	Selection bias Potential for recall bias Included pre-term infants Classified participants supplementing with formula as BMF if using any breast milk
Jiang et al. (2015) China	Prospective Cohort	n=384 Majority \geq HS education	Proportion of expression and exclusive expression Proportion of full and partial BMF Reasons for expressing Duration of any and full BMF	Selection bias Potential for recall bias Lack of specificity in levels of partial BMF Potential for misclassification (if only

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
				BME manually or occasionally was classified as DBF)
Keim et al. (2019) USA	Retrospective Cross-sectional	n=225 Majority \geq HS education, white, married, >\$40k/year	Proportions ever fed at breast Proportion ever expressed Duration of feeding methods Duration of BMF	Selection bias New tool does not capture BMF exclusivity
Labiner-Wolfe et al. (2008) USA	Secondary Analysis (IFPS II)	n=3606 Majority > HS education, white, married, >185% of poverty level	Proportion ever expressing Timepoint of beginning to express	Selection bias
Shealy et al. (2008) USA	Secondary Analysis (IFPS II)	n=449-1466 (Characteristic not provided)	Proportion of mothers exclusively expressing Proportion full BMF	Selection bias Did not differentiate between EE-EBMF and EE-ABMF in EE-BMF group
Category: Impacts of Expression on Exclusivity and Duration				
Bai et al. (2017) Hong Kong	Prospective Cohort	n=2450 Majority \geq HS education, high income	Proportion of expressed BMF Duration of any BMF	Selection bias Potential for recall bias Potential misclassification due to measurement of proportion of feeds rather than volume

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
				Did not differentiate between EE-EBMF and EE-ABMF in EE-BMF group
Bream et al. (2017) USA	Retrospective Chart Review	n=355 Majority African American and public insurance	Full and any Breast milk feeding Feeding type Breast pump (yes/no)	Selection bias High number of missed 2-month time-point visit Inconsistent chart documentation Potential for misclassification in having a breast pump vs no breast pump
Felice et al. (2016) USA	Secondary Analysis (IFPS II)	n=1160 Majority > HS education, white, married, >185% of poverty level	Reasons for expression Any and full breast milk feeding Frequency of expression Duration of BMF and at breast feeding	Selection bias Potential for estimated missing data points from unreturned surveys to skew outcome data Elective vs. nonelective categories applied to reasons for BME were constructs determined by researcher and not necessarily reflective of the participants' motivations

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
Demirci and Bogen (2017) USA	Prospective longitudinal	n=61 Majority \geq HS education, white, married	Proportion of daily direct and expressed BMF Breastfeeding attitude on Iowa Infant Feeding Attitude Scale	Selection bias High attrition rate Large amount of missing data
Geraghty et al. (2005) USA	Retrospective Cross- Sectional	n=346 Majority married, white, income >\$50k/year	Proportion of mothers expressing during first six months Proportion of BMF vs. formula feeds Methods of BMF Duration of BMF	Selection bias Potential for recall bias Included pre-term infants Classified participants supplementing with formula as BMF if using any breast milk
Geraghty et al. (2012) USA	Prospective longitudinal	n=59 Majority \geq HS education, white, married	Usual method of BMF Exclusivity of BMF Feeding-related issues BMF feeding intentions Duration of BMF	Selection bias Potential for misclassification of feeding method due to participant interpretation of “usual” feeding method
Jiang et al. (2015) China	Prospective Cohort	n=384 Majority \geq HS education	Proportion of expression and exclusive expression Proportion of full and partial BMF Reasons for expressing Duration of any and full BMF	Selection bias Potential for recall bias Lack of specificity in levels of partial BMF Potential for misclassification (if only BME manually or occasionally was classified as DBF)

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
Keim et al. (2019) USA	Retrospective Cross- sectional	n=225 Majority \geq HS education, white, married, >\$40k/year	Proportions ever fed at breast Proportion ever expressed Duration of feeding methods Duration of BMF	Selection bias New tool does not capture BMF exclusivity
O'Sullivan et al. (2019) USA	Cross-sectional Survey	n=456 Majority \geq HS education, white, married	Proportions ever fed at breast Proportion ever expressed Duration of feeding methods Duration of BMF	Selection bias
Pang et al. (2017) Singapore	Secondary Analysis (GUSTO birth cohort study)	n=500 Majority \geq HS education, Chinese	Feeding method Proportion expressing and exclusive expressing Duration of BMF	Selection bias Missing data, non-random Employment status documented at pregnancy and six-month timepoint but not three-month
Rahimi et al. (2020) Afghanistan	Cross-sectional Survey	n=1028 Majority \leq primary education, low socioeconomic status	Proportion of full BMF Proportion ever using any expressed breast milk Duration of full BMF	Selection bias Authors identified multiple potential confounding variables that were not measured
Schwartz et al. (2002) USA	Prospective Cohort	n=946 Majority \geq HS education, income >\$50k/year	Any expression Duration of BMF	Selection bias

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
Win et al. (2006) Australia	Secondary Analysis (PIFS II)	n=587 Majority \leq HS education, Australian born	Any expression Duration of any BMF	Selection bias
Yourkavitch et al. (2018) USA	Secondary Analysis (IFPS II)	n=1624 Majority > HS education, white, married	Regular expression vs Nonregular expression Duration of any and full BMF	Selection bias Potential for recall bias Potential for misclassification due to BMF cessation measures when participant stopped DBF or BME, not when infant stopped receiving BMF
Category: Experiences of Expression				
Clemons and Amir (2010) Australia	Cross-sectional Survey	n=903 Majority \geq HS education, married, Australian born	Frequency of Expressing Proportions of mothers who express Frequency of Expression Reasons for Expression Proportion full and partial BMF Methods of expressing Sources of expression information	Selection bias Lack of specificity in frequency of expression (i.e., "several times per day" vs actual number)
Flaherman et al. (2013) USA	Prospective Survey (Used Sample from RCT with different aims)	n=68	Breast Milk Expression Experience Measure (BMEE) BME (yes or no) at one month	Sample size too small to determine construct validity Selection bias (only inpatient postpartum women and not breastfeeding well)

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
Jardine (2019) Multinational	Cross-sectional survey	n=1215 Majority white, ≥ HS education, married, high income	Information sources and timing of information about exclusive expression	Selection bias
Johns et al. (2016) Australia	Prospective Cohort	n=924 Majority ≥ HS education, married, Australian born, and high income	Breast pump use and types Proportion of mothers expressing Reasons for expression	Selection bias Potential for recall bias
Category: Factors Related to Expression				
Bai et al. (2017) Hong Kong	Prospective Cohort	n=2450 Majority ≥ HS education, high income	Proportion of expressed BMF Duration of any BMF	Selection bias Potential for recall bias Potential misclassification due to measurement of proportion of feeds rather than volume Did not differentiate between EE-EBMF and EE-ABMF in EE-BMF group
Binns et al. (2006) Australia	Secondary Analysis (PIFS I and	n=1143 Majority ≤ HS education,	Proportion of BMF mothers Proportion of mothers who express Frequency of reasons for expressing	Selection bias

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
	PIFS II)	Australian born		
Clemons and Amir (2010) Australia	Cross-sectional Survey	n=903 Majority ≥ HS education, married, Australian born	Frequency of Expressing Proportions of mothers who express Frequency of Expression Reasons for Expression Proportion full and partial BMF Methods of expressing Sources of expression information	Selection bias Lack of specificity in frequency of expression (e.g., "several times per day" vs actual number)
Geraghty et al. (2012) USA	Prospective longitudinal	n=59 Majority ≥ HS education, white, married	Usual method of BMF Exclusivity of BMF Feeding-related issues BMF feeding intentions Duration of BMF	Selection bias Potential for misclassification of feeding method due to participant interpretation of "usual" feeding method
Johns et al. (2016) Australia	Prospective Cohort	n=924 Majority ≥ HS education, married, Australian born, and high income	Breast pump use and types Proportion of mothers expressing Reasons for expression	Selection bias Potential for recall bias
Karmaus et al. (2017) USA	Secondary Analysis IFPS II	n=1899 Majority > HS education, white, married, >185% of poverty level	Proportion of at breast feeding Proportion of exclusive expression	Selection bias Maternal characteristics only collected near birth and therefore unable to analyze changes and effects on feeding over

Author (year) country	Design	Sample characteristics ^a	Variables measured	Limitations
				six months
Labiner-Wolfe et al. (2008) USA	Secondary Analysis (IFPS II)	n=3606 Majority > HS education, white, married, >185% of poverty level	Proportion ever expressing Timepoint of beginning to express Sociodemographics	Selection bias
Leonard et al. (2011) USA	Secondary Analysis (IFPS II)	n=2288 Majority > HS education, white, married, >185% of poverty level	Proportion of mother expressing Duration of BMF BMI	Selection bias Lack of clarity in definition of breastfeeding provided to participants Questions about duration of BMF not classified by method
Loewenberg Weisband et al. (2017) USA	Cross-sectional survey	n=100 Majority > HS education, white, married	BMF and Expression intentions Proportion expressing prior to discharge Reasons for expression	Selection bias Small sample size resulting in insufficient statistical power to identify covariates of expression

^a Sample characteristics generalized based on majority findings for, level of education, marital status, race/ethnicity, and income level as available

Table 5*Qualitative Research Studies on Breast Milk Expression*

Author (year) country	Data collection	Sample	Aims	Limitations
Abbott and Scott (2017) England	Semi-structured interviews	n=2	Explore breast milk feeding experiences of mothers in prison	Small Sample Transferability limited to incarcerated women
Dietrich Leurer et al. (2020) Canada	Semi-structured interviews	n=35 Majority married, highly educated, high socioeconomic status	Identify information sources and needs related to breast milk expression	Selection bias limiting transferability Potential bias in interpretation by RN research team
Felice et al. (2017a) USA	Semi-structured interviews	n=20 “Diverse”	Describe motivations, perceptions of, and strategies of mothers providing expressed breast milk to infants	Interview guides changed over time and therefore earlier participants may not have been asked all or same questions Researcher characterizations of reasons for BME as elective or nonelective may have oversimplified experience
Felice et al. (2017b) USA	Semi-Structured Interviews	n=20 “Diverse”	Describe mothers’ perceptions, feelings, and practices of expressing breast milk	Interview guides changed over time and therefore earlier participants may not have been asked all or same questions

Author (year) country	Data collection	Sample	Aims	Limitations
Flaherman et al. (2016) USA	Focus Groups	n= 10 groups (56 mothers) Majority with college education, racially diverse	Describe experiences of expressing among mothers with concerns about milk supply	<p>Researcher characterizations of reasons for BME as elective or nonelective may have oversimplified experience</p> <p>Selection bias limiting transferability Initial aim of study to investigate PIMS and therefore discussions not designed to investigate BME Not transferable to women without milk supply concerns Nature of focus groups may lead to biased results due to group influences over individuals</p>
Ismail et al. (2012) Malaysia	Semi-Structured Interviews	n=20	Explore employed women's perspectives on feasibility, acceptability, and safety of breast milk expression	Limited to Malaysian sample
Johnson et al. (2009) United Kingdom	Audio-diaries and Semi- structured Interviews	n=16 Majority white, married, middle to high income	Explore experiences of breast milk expression through a feminist lens	<p>Selection bias limiting transferability Nature of audio-diary method limited researcher ability to follow-up on topics</p>

Author (year) country	Data collection	Sample	Aims	Limitations
Johnson et al. (2013) United Kingdom	Audio-diaries and Semi- structured Interviews	n=7 Majority white, diverse incomes and class	Describe infant feeding experiences of women who expressed milk in early postpartum time period	Initial aim of larger study was related to the experience of breastfeeding and not BME which may have limited participants' sharing of BME experience Inability to assess saturation due to sample from larger study with different aims Nature of audio-diary method limited researcher ability to follow-up on topics
Larsen and Kronborg (2013) Denmark	Semi-structured Interviews	n=7	Describe experiences of mothers who had unsuccessful breastfeeding experiences	May not be transferable to women with successful BMF experiences Small sample size
O'Sullivan et al. (2017) USA	Semi-structured Interviews	n=41 Majority married, college degree or higher	Explore patterns and behaviors of breast milk expression and feeding	Selection bias limiting transferability Potential impact of researcher on amount of information shared by participants due to lack of personal BMF experience
Yamada et al. (2016) Multinational	Cross-sectional analysis of online discussion forum posts	n=543 posts	Describe information seeking behavior in an online forum of women providing expressed milk	Unknown demographics of authors of posts No analysis of responses to posted questions

Prevalence and Patterns

The proportion of mothers who express milk has increased over time as evidenced by large cohort studies in multiple countries. Moreover, in the United States (U.S.), recent studies show increased breast milk expression rates compared to data collected prior to 2000. In Australia, using data collected in the Perth Infant Feeding Study (PIFS) I that took place in 1992 to 1993 compared to data collected in 2002 to 2003 during the PIFS II, researchers noted that the prevalence of any breast milk expression during establishment of breastfeeding nearly doubled, rising from 39% to 69%. However, at six months postpartum, rates were similar between cohorts at 26% and 28% respectively (Binns et al., 2006). Bai et al. (2017) noted a similar trend in China in their comparison of cohorts from the years 2006 to 2007 and 2011 to 2012. While they specifically looked at those who were exclusively expressing, both full and partial BMF was included. The rate of exclusive expression with any level of BMF was between 5% and 8% across the first year postpartum in the first cohort and just 5 years later was 18% to 19.8% in the second cohort.

There have been no such studies in the U.S. that compare cohorts, however the oldest data in this review were collected between 1994 and 1998. In their study, Schwartz et al. (2002) followed 946 mothers at weeks 3, 6, 9, and 12 and found that 30% expressed milk in the first week and that rate rose to 45% between weeks 9 and 12. In contrast, more recent data shows that in the U.S. rates of any breast milk expression are now much higher. Between the years of 2005 and 2007, longitudinal data were collected from a national sample of women beginning during pregnancy and continuing over the course of the first postpartum year including nine questionnaires on infant feeding as part of the

Infant Feeding Practices Survey II (IFPS II) (Fein et al., 2008). Using data from IFPS II, Labiner-Wolfe et al. (2008) found that 85% of women had expressed milk at least once by 4.5 months postpartum and more than half of those who had expressed started when the infant was less than one week old. Similarly, Geraghty et al. (2012) found that 63% of their sample of 59 women had started expressing milk in the first month. These rates of early breast milk expression are substantially higher than the 30% found from data from the 1990s indicating that the proportion of women expressing milk in the U.S. is increasing. However, both samples were not nationally representative as they were comprised of mostly white women with higher incomes and education than the general population.

These high rates of BME are not unique to the United States. In an Australian sample of 903 mothers, 28% were at least partially expressing milk prior to discharge from the hospital. Over 60% were at least partially expressing at postpartum timepoints of less than 1 month, 1 to 2 months, and 3 to 6 months. In total, 98% of the participants had expressed at some point during BMF (Clemons & Amir, 2010). In China, 86% expressed milk while breastfeeding was being established (Jiang et al., 2015). Despite this trend toward high rates of expression in populations worldwide, it is important to note that the same is not true for races and ethnicities within countries.

Most studies on prevalence in the U.S. and Australia have had samples consisting predominantly of white, highly educated, married mothers (Binns et al., 2006; Clemons & Amir, 2010; Geraghty et al., 2012; Geraghty et al., 2005; Geraghty et al., 2013; Labiner-Wolfe et al., 2008; O'Sullivan et al., 2019). These studies documented rates of any milk expression between 92% and 98%. Compared to these rates, the two studies in

the U.S. that had larger samples of African American mothers documented much lower rates of any expression. In a sample of 225 mothers, of which the majority had less than a bachelor's degree and 22% were African American, only 79% had ever expressed (Keim et al., 2019). In a sample of inner-city, predominantly African American mothers, the rate of any expressed milk feeding was only 13.2% (Bream et al., 2017). More research is needed in this population.

Ethnic differences in rates of breast milk expression were noted in Singapore as well. Chinese, Malaysian, and Indian women participated in the Growing Up in Singapore Toward Healthy Outcomes (GUSTO) cohort study in which the overall rate of any milk expression was 56.5%. However, Chinese women were more likely to express than Malaysian and Indian mothers (Adjusted Odds Ratios = 3.41, 1.08, and 1.0 respectively) (Pang et al., 2017). These results indicate there may be differences that require exploration, yet most U.S. samples have lacked racial and ethnic diversity, and none have explored decision-making and experiences of women of color that EE-EBMF.

Similar patterns in the proportion of women expressing milk over the course of the first year can also be seen globally. Rates of milk expression tend to rise over time with a corresponding decrease in direct breastfeeding (DBF) rates. In one study in the U.S., 61 women were asked to track infant feeds along with feeding mode for 8 weeks. In that time, researchers saw that the proportion of DBF declined while the proportion of expressed BMF increased (Demirci & Bogen, 2017). Similarly, Geraghty et al. (2005) compared mothers of term and preterm singletons and multiples and found that in all groups, rates of those giving EE-EBMF increased rapidly in the early postpartum period, reached a peak around 30 days, and slowly decreased again until the final timepoint of

the study at 180 days postpartum. In both cohorts of the PIFS in Australia, rates of any expression were high in the first month (38% and 68%), then lower at 6 months (26% and 28%) (Binns et al., 2006). In contrast, any milk expression continues to increase until six months, reaching 88%, before decreasing throughout the remainder of the first year reaching 17.2% at 12 months in China (Jiang et al., 2015). These three studies were from different countries and varied results may reflect policy differences regarding maternity leave practices. While these findings demonstrate data trends, they do not highlight factors that influenced changes in feeding methods over time. Qualitative studies are needed to understand, more deeply, the factors that influence changes in infant feeding method during the postpartum period.

While few studies examined the prevalence of EE-EBMF, several measured rates of infants receiving EE-ABMF. In Hong Kong, from 2006 to 2012, the rates of EE-ABMF rose from 5-8% to 18-19.8% (Bai et al., 2017). In Singapore, the rate of EE-ABMF was 16.5% (Pang et al., 2017), while in China an even higher rate of 22.6% was observed (Jiang et al., 2015). This study in China also revealed that exclusive expression was more common in those partially BMF compared to exclusively BMF. While 28.9% of partial BMF mothers were exclusively expressing, only 12.9% of exclusive BMF mothers were exclusively expressing ($p < 0.001$). In the U.S., data from the IFPS II indicated that 6% of BMF mothers exclusively express (Karmaus et al., 2017; Shealy et al., 2008). A more recent study of 456 women in the U.S. indicated exclusive expression rates of 3% in the early postpartum period, increasing to 10.6% at 3 months, and then again rising to 14% at 6 months (O'Sullivan et al., 2019).

As was previously mentioned, the studies conducted in the U.S. are limited by the lack of racial, ethnic, and socioeconomic diversity. Studies in the U.S. do indicate that there are variable rates of EE-ABMF. Changing rates of EE-ABMF or EE-EBMF throughout the postpartum period indicate a need to explore the feeding experience as a whole to understand changes and key events that shape those experiences and decisions. Moreover, differences in EE rates between PBMF and EBMF women signal a need to explore the experiences from each perspective. In this study, I will explore the experience of women who are or have EE-EBMF. By exploring women's entire infant feeding experience, I may encounter women who also practice EE-PBMF which may help shed light on these differences.

Impacts on Exclusivity and Duration

Exclusivity and duration have been key outcomes assessed in studies on breast milk expression with conflicting findings. A portion of these studies found negative impacts of breast milk expression on exclusivity and duration (Bai et al., 2017; Bream et al., 2017; Felice et al., 2016; Geraghty, Davidson et al., 2012; Geraghty et al., 2005; Jiang et al., 2015; Pang et al., 2017; Rahimi et al., 2020; Schwartz et al., 2002; Yourkavitch et al., 2018), however, some noted confounding factors that change the relationship.

Three studies contained similar findings that milk expression negatively impacted duration of BMF, and these researchers also analyzed the results in relation to the reasons for expressing. Pang and colleagues (2017) found that in their analysis of 500 women participating in a large cohort study in Singapore, women who were directly breastfeeding or direct breastfeeding combined with partially expressed breast milk feeding (PE-BMF) had similar durations of any BMF. However, those who were EE-

EBMF and EE-PBMF had the shortest duration of any BMF. For those practicing any BMF (meaning they may be exclusively BMF or supplementing with formula or feeding complementary foods), direct breastfeeding and partially expressing mothers had mean durations of 9.5 and 9.7 months. However, women whose breast milk was only expressed fed any breast milk for significantly less time with a mean of only 7.1 months ($p < 0.001$). For those practicing exclusive breast milk feeding (with no formula or foods), all means were lower, but the EE-EBMF mothers were again significantly lower. Durations were 2.3, 2.5, and 1.6 months respectively for women directly breastfeeding, PE-EBMF, and EE-EBMF ($p = 0.001$). In this sample, the reasons for expressing (e.g., oversupply, storing for future use, etc.) did not modify the association between feeding method and duration.

Using a sample of 1160 mothers participating in the IFPS II, Felice et al. (2016) also found that mothers who expressed any milk stopped any BMF approximately six weeks earlier than those that did not express. Mothers who expressed any milk were less likely to be feeding any breast milk or feeding at breast at 6, 9, and 12 months with differences widening with the frequency of expressing. Contrary to findings from Pang et al., (2017), Felice et al. (2016), classified reasons for expressing as elective (e.g., for others to feed) or nonelective (e.g., inability to latch, pain). Mothers who expressed for nonelective reasons had shorter durations of partial and exclusive BMF than mothers who expressed for elective reasons. The categories of elective and nonelective reasons were chosen by the researchers based on previous qualitative work and applied to reasons listed in the IFPS survey questionnaire. Therefore, it is unknown if the women responding to this particular survey viewed the reasons they selected as elective or nonelective or if their reasons changed over time. When not classified, the findings in

Singapore also contradict the findings in the U.S. signaling a need for more in-depth exploration of the experience and how women view their reasons for expressing and how these reasons shape their decisions, experiences, and duration of exclusive BMF.

Yourkavitch et al. (2018) also analyzed the IFPS II by dividing their sample into two groups: those who regularly expressed and those who either did not express or did so only occasionally. They found that regularly expressing mothers fed any breast milk an average of 32.5 weeks while nonregular expressing mothers fed any breast milk for an average of 37.2 weeks. The groups practiced exclusive BMF for 15.2 and 16.6 weeks, respectively. The factor that modified the risk of early cessation in this study was whether the mother was working or nonworking. Working vs. nonworking regularly expressing mothers were 1.62 and 2.05 times more likely to stop any BMF when compared to nonregular expressers. Regular expressers remained 1.4 times more likely to stop full BMF regardless of work status. Breast milk feeding is complex as it occurs in a variety of contexts, with maternal employment playing a role in feeding behaviors among women who express as indicated by this study. Therefore, the lived experience from the perspectives of women is important in understanding the realities of EE-EBMF in all of their unique contexts.

Negative associations between expression and breast milk feeding exclusivity and duration were found to be nonsignificant after controlling for other variables in some studies. Bai et al. (2017), Geraghty et al. (2012), and Jiang et al. (2015) initially found that any expressed BMF led to increased risk of early termination of partial and expressed BMF. Increasing proportions of expression and exclusive expression were also initially significant risk factors for early BMF termination in prospective cohort studies in Hong

Kong and China (Bai et al., 2017; Jiang et al., 2015). However, after adjusting for several sociodemographic factors (i.e. maternal age, marital status, parity, income, and others) these associations with early cessation of BMF were no longer significant in two studies (Bai et al., 2017; Geraghty et al., 2012) and there was no difference between those expressing and those feeding at breast among mothers whose maternity leave was longer than six months (Jiang et al., 2015). This again shows that numerous contextual factors are at play in the lives of women who express milk and BMF. More in-depth studies are needed to understand the roles of these factors in the BMF experiences of women who express milk.

Three studies contain findings that suggest that expressing and breast pumps negatively impact BMF duration, however, there is reason to take caution before making assumptions about causation or generalizing these findings due to sample and measurement characteristics. In one study, researchers found that mothers who fed expressed breast milk were 2.6 times more likely to stop full BMF (Rahimi et al., 2020). However, in this sample of 1028 mothers in Afghanistan only 16% had ever expressed milk, which is in stark contrast to most studies that document much higher rates of expression.

A different group of researchers studied the impact of having a breast pump on rates of expressed BMF and duration of BMF. Their sample consisted mostly of African American public insurance recipients who were residents of an urban U.S. city. Women who had a breast pump had higher rates of feeding expressed milk compared to those without a pump (16.6% vs. 8.2%, $p=0.02$) but lower rates of any BMF between 1.5 and 3.5 months postpartum (31.4% vs. 46.9%, $p=0.004$) (Bream et al., 2017). However,

researchers did not quantify actual breast pump use, therefore it is unknown if participants in the “with breast pump” group were using their breast pump, expressing more frequently, or if there was another barrier to BMF. Additionally, this was primarily a low-income population of African Americans that face additional barriers to breastfeeding in general such as return to employment which could have contributed not only to ownership of a breast pump, but also to early termination of BMF. In another study, a smaller proportion of mothers who expressed at two weeks postpartum continued BMF at months one, two, and three compared to mothers who fed at the breast (Geraghty et al., 2005). However, similar to the Bream et al.’s (2017) study, the sample limits generalizability. Mothers of preterm infants were included in the analysis which could be a contributing factor adding complications to BMF.

While researchers in several of these studies found that the negative impacts of expressing were nonsignificant after controlling for other factors, researchers conducting other studies found positive impacts of expression on breastfeeding duration. In a prospective cohort study (n=946), early milk expression, defined by Schwartz et al. (2002) as expressing within the first three weeks was associated with early BMF cessation. After three weeks, however, mothers who practiced any expressed BMF were 75% less likely to stop BMF than feeding using a combination of methods and 98% less likely to stop BMF as mothers who practiced DBF only. According to data from the IFPS II, without any breastmilk expression, obese women in the U.S. have a shorter duration of BMF. Expressed BMF was found to increase duration to the point that there was no difference between obese and normal weight women (Leonard et al., 2011). In Australia, Clemons & Amir (2010) found that 33.6% of participants in their study agreeing with the

statement “Without a breast pump, I would have stopped breastfeeding sooner” showing that women may use expressing to continue breastfeeding. Schwartz et al (2002) and Leonard et al (2011) conducted their studies in the U.S. which has no mandated paid parental leave. At the time of study conducted by Clemons & Amir (2010), Australia also did not have paid parental leave. It may be that expressed BMF extended BMF duration in these studies due to this similarity in parental leave. These studies had samples of mostly highly educated and middle to high-income women.

Likewise, data from the Perth Infant Feeding Study Mark II (PIFS II) revealed that mothers who expressed milk were at lower risk of terminating any breast milk feeding before six months with an adjusted relative risk ratio of 0.71 (Win et al., 2006). This sample consisted of mothers recruited from two urban hospitals and therefore included women from a lower socioeconomic status and with lower educational attainment than many other studies on breastfeeding. Eighty-eight percent had a high school education or below. These positive impacts of milk expression in this type of population contradicts the findings of Bream et al. (2017) who had a similarly low-income sample but found that those with a breast pump terminated BMF earlier than those that did not. The differences in these two studies may highlight that impacts of the environment such as social and economic policies of differing countries may impact breastfeeding in addition to feeding mode signaling a need to explore these individual experiences more in-depth. Moreover, the contradicting findings of how milk expression impacts BMF duration in general warrants further investigation of the factors involved with feeding mode and feeding decisions.

Other studies provide evidence of positive relationships between breast milk expression and duration of BMF and some note discrepancies between newer infant feeding surveys and those used in national surveillance in determining duration (Demirci & Bogen, 2017; Geraghty et al., 2012; Jiang et al., 2015; Keim et al., 2019; O'Sullivan et al., 2019; Win et al., 2006). Keim et al. (2019) and O'Sullivan et al. (2019) developed new surveys designed to contain more detailed questions about expression and mode of feeding and were then compared to questionnaires used for national BMF surveillance such as the National Immunization Survey, the National Health and Nutrition Examination Survey, and the National Survey of Children's Health. Keim et al. (2019) tested their survey in a sample of 225 women in the U.S. with most being married, white, and with greater than a high school education. O'Sullivan et al. (2019) tested their survey in a sample with similar demographics (n=456). Both sets of researchers used their cross-sectional surveys and federal surveillance questions and found that mothers who practice any expressed BMF reported shorter duration of BMF on the national survey questions. O'Sullivan and colleagues (2019) note that the likely reason for the discrepancy is that timing of production and consumption of breast milk are not synchronous. In their sample, 10% of women continued to feed expressed milk for more than 4 weeks after they stopped expressing due to the ability to store excess milk. Keim et al. (2019) also found that on their new survey, the average duration of consumption of expressed milk (179 days) was similar to the duration of direct breastfeeding (180 days), yet federal questionnaires indicated shorter duration of expressed milk feeding. In light of these findings, caution should be taken in drawing conclusions about impacts of milk

expression on duration and exclusivity. More studies that examine feeding methods using clearly operationalized feeding methods are needed.

Experiences of BME

Investigations aimed at understanding the experience of expressing and feeding expressed breast milk have mostly been qualitative (Abbott & Scott, 2017; Dietrich Leurer et al., 2020; Felice et al., 2017a, 2017b; Ismail et al., 2012; Johnson et al., 2013; Johnson et al., 2009; Larsen & Kronborg, 2013; O'Sullivan et al., 2017; Yamada et al., 2016), with the exception of three quantitative studies that contained survey questions related to experiences (Clemons & Amir, 2010; Jardine, 2019; Johns et al., 2016). The focus of the research included information seeking behaviors and needs of expressing mothers, feelings, and perceptions about expressing, intentions related to expressing and concerns related to milk supply.

There was little insight given into the experience of exclusive expression because samples consisted primarily of mothers who had ever expressed milk rather those who EE-BMF. However, to gain insight into the experiences of mothers who were unsuccessful at direct breastfeeding Larsen and Kronborg (2013) conducted semi-structured interviews with in seven women who had given up breastfeeding, four of whom transitioned to EE-ABMF. The women described feelings inadequacy as mothers and noted expressing was burdensome. Due to the burdens and time commitments associated with BME, women felt that stopping BME, and therefore BMF, was a relief. Yamada et al., 2016 conducted a cross-sectional analysis of 543 postings by women in an online forum to investigate the natures of questions posed by women in relation to expressing. One post read “Pumping is tiresome, I find it hard to do others things...I’m

going nuts...” (p.7)(Yamada et al., 2016). Jardine (2019) conducted a cross-sectional survey of 1215 women to describe the information seeking behaviors and knowledge of women about EE-BMF. Women who EE-ABMF who had not heard of the practice prior to birth also described feeling burdened, but also had negative feelings such as embarrassment, guilt, and frustration. On the other hand, in a unique study of 28 women about their experiences of breastfeeding while incarcerated, only 2 inmates continued to practice EE-BMF for their infants while remaining in prison after birth. These two women found expressing milk to be fulfilling as they could still provide nutrition despite their separation from their infant (Abbott & Scott, 2017). The experiences of EE-EBMF and women’s feelings about the practice may vary by reasons, support, their circumstances, and knowledge. Samples of two and four women, however, are not adequate to gain an understanding the experience of EE-EBMF. Transferability of these studies is also limited to incarcerated women or women that were unsuccessful in efforts with DBF. These samples did not include women who had intended to EE-EBMF as their primary method of feeding.

Mothers who were DBF in combination with PE-BMF also encountered negative feelings and experiences. They also felt that it was time-consuming and during focus group interviews with 56 women in the U.S., many reported that pumping was painful (Flaherman et al., 2016). Although the purpose of these focus group interviews was to gain knowledge about women’s milk supply concerns, milk expression was a topic that was discussed frequently. However, these results cannot be generalized to women without milk supply concerns. Yamada et al. (2016), also based in the U.S., found that discomfort and pain were evident in their analysis of questions posed in an online forum.

Several women posed questions asking for strategies to make expressing more comfortable. Thirteen percent of participants of a cross-sectional survey study of women in Australia (n=924) reported having had an adverse reaction such as pain while using a breast pump (Johns et al., 2016). As pain is an often-cited reason for cessation of breast milk feeding, it is concerning that these studies have found many reports of pain among women who practice BME, yet the experience of women who practice EE-BMF along with descriptions of how pain may shape the trajectory of infant feeding decision-making in women who express.

In addition to finding expression to be painful and inconvenient, other negative feelings about BME may be present. Women in Malaysia conveyed feelings of embarrassment regarding expressing while at work with male colleagues despite their colleagues' approval of the practice (Ismail et al., 2012). Moreover, in a sample of 35 in Canada, women described feelings as if they were being judged by their healthcare providers when asking for information about BME (Dietrich Leurer et al., 2020). Similarly, in interviews with seven women who practiced PE-BMF for more than half of their infant's feedings, Johnson et al. (2013), women felt guilt and stigma due to society's views that equate breastfeeding with being a good mother.

Due to negative feelings about the act of expressing, mothers discussed their preferences for and intentions to breastfeed directly, but that expressing milk was necessary to achieve their goals. Only 0.4% of a sample of 904 mothers indicated that their reason for expressing was that it was their preferred method of feeding (Clemons & Amir, 2010). In one study, this preference led mothers who combined direct breastfeeding and expressed milk feeding to feed directly whenever possible and leave

expressed milk feedings for others to perform (Felice et al., 2017a). These mothers found that time spent directly breastfeeding was worth their time but that expressing felt inconvenient (Felice et al., 2017b). Despite preferences for DBF, women encountered breastfeeding problems or separations from their infant and saw expressing their milk as a solution to continue BMF (Flaherman et al., 2016; Johnson et al., 2013; Johnson et al., 2009). One woman in a group of four who were unable to successfully breastfeed but continued EE-BMF stated that she “didn’t feel good about it”, although providing the nutritional benefits of breast milk was motivation to continue (Larsen & Kronborg, 2013). Larsen & Kronberg’s study (2013) was the only one to include mothers who practice EE-BMF and therefore the feelings of mothers who EE-BMF as their intended feeding method are unknown.

There were differences in how mothers felt that milk expression impacted bonding with their infants and their daily lives. Johnson et al. (2009) noted that while expressing milk allowed others to experience bonding during infant feeding, it took mothers’ time away and disrupted their own bonding with their infants. Mothers noted that fathers enjoyed taking part in feeding rather than only ever doing diaper changes and baths which they considered to be less enjoyable. Those who exclusively expressed, however, felt the opposite, with one mother feeling like the father “had all the good moments” while she was left to express the milk (Larsen, 2011, p.852). These findings of study participants of being “tied to the pump” is juxtaposed with feelings of freedom that milk expression gives some participants. In a feminist analysis of mothers’ early experiences, results revealed that participants experienced a sense of empowerment and freedom as they were able to manage feeding in public without fear of exposure and

manage the demands of breastfeeding while still being independent from their infant (Johnson et al., 2009). Felice et al. (2017b) conducted interviews with a diverse sample of 20 women about their experiences with any BME over the course of the first postpartum year. They noted that one participant stated that “pumping also makes you feel a lot more liberated...that you can do things and you can leave”. Feelings of freedom and empowerment may be factors contributing to a positive and satisfying experience, but their relationship with duration and infant feeding decisions has not been explored in EE-BMF women.

Concerns about breast milk supply were commonly documented in the literature on women’s experiences of BME. Johnson (2013) found that women who practiced PE-BMF for more than half of their infant’s feedings acknowledged the benefits of breast milk, but also equated being able to supply breast milk with being a good mother. They found that BME useful in monitoring that supply and served as a way to improve the supply as needed. In contrast, during focus group interviews with 56 women with milk supply concerns, participants conveyed that BME allowed them to see the quantity produced which intensified concerns about their ability to produce enough. In this context of low milk supply, they thought so highly of their expressed breast milk that in some instances were afraid to use their stored supply, rather saving it for future use in the case of illness (Flaherman et al., 2016). Similarly, participants in O’Sullivan et al. (2017) sample of 41 women placed a high value on their milk and saved it for use during illness, while others stated that their reasons for BME was a way to either increase their stored milk supply or alleviate oversupply issues. Seeing the amount of breast milk being produced along with the ability to store and make decisions about its use are experiences

that women who practice DBF do not have as breast milk is transferred directly into the infant's mouth. This different experience may evoke different emotions and feelings that influence women's experiences and decisions which warrants further exploration.

Another aspect of the experience of milk expression was how women learned about and how to express breast milk. Dietrich Leurer et al. (2020) conducted a study of 35 mothers in Canada in which the participants reported on their information seeking behaviors and information needs on BME. The participants reported that they most often sought information and advice from registered nurses and lactation consultants. However, when seeking information from registered nurses and physicians, these types of providers often couldn't provide the information they needed and when they did provide information, it was inconsistent.

Flaherman et al. (2016) also found during focus group interviews that women reported feelings of frustration due to receiving inconsistent advice about expressing milk from healthcare providers including nurses and lactation consultants. A common inconsistency reported was when to start expressing milk with some nurses and lactation consultants recommending early BME for comfort through times of engorgement while others advised not to use BME in the first few weeks as a method of preventing engorgement. These studies both had samples of women that practiced PE-BMF, but findings of inadequate or inconsistent information for women on BME is troubling when considering the context of EE-BMF. For women practicing PE-BMF, they may have been able to provide breast milk via DBF despite information needs about BME. If women who EE-EBMF have similar experiences, lack of information or guidance could disrupt their ability to exclusively provide breast milk. However, their experiences were

unaccounted for in this previous research and more studies are needed to determine if the information needs of women who practice EE-BMF are being met during their infant feeding experience.

Another source of information found by Dietrich Leurer et al. (2020) was peers on the internet. Yamada et al. (2019) also found while monitoring a BabyCenter online forum, that there were 543 posts from women seeking information about BME with the most common topics being strategies for BME, coping with difficulties, and storage and preparation of expressed breast milk. Jardine (2019) focused on women that practiced EE-BMF in a cross-sectional survey distributed to a multinational audience online in an effort to describe information seeking behavior and prenatal knowledge about EE-BMF. Participants indicated that they did not receive information on their method of feeding prior to birth from their healthcare providers and sought information elsewhere. Seventy-one percent of the 1215 women had not heard of exclusive expressing (Jardine, 2019). The 29% of women who did have knowledge of EE-BMF prior to birth reported fewer feelings of frustration, insecurity, depression, and disappointment in their infant feeding experience. It appears as though women's level of knowledge on their feeding method may shape their perceptions of their experience. This relationship needs further exploration and explanation from the perspectives of women. Results indicating that information needs of women who PE-BMF or EE-BMF are not being met by nurses and lactation consultants presents a problem that requires further exploration to better support women in their chosen feeding methods.

Flaherman et al. (2013) designed the Breast Milk Expression Experience scale (BMEE) to measure mothers' personal appraisal of the experience of breast milk

expression in the early postpartum period. The instrument was developed based on existing literature and experiences of women who express. It was tested in a sample of 68 women during a randomized controlled trial comparing hand expression to use of an electric pump during the first few days postpartum. This sample was too small to determine construct validity. The instrument contains three subscales: social support for expression, ease of learning how to express, and personal experience. Despite the inability to determine construct validity, the scores on the BMEE prior to discharge from the hospital were shown to be predictive of BME behavior at one month. Means higher than three were associated with a greater likelihood of BME at one month. However, the authors did not state whether these women who were expressing at one month were EE-BMF, PE-BMF with DBF, or whether the comparison group was DBF or had terminated all BMF. In addition to only being intended for use in the early postpartum period, it was only administered to women who were expressing due to difficulties latching. Therefore, it may not be valid for those who electively choose to EE-BMF rather than DBF. Moreover, items that were dropped during the initial testing pertaining to embarrassment while pumping and being seen by others while pumping may not have been relevant in the hospital setting but may be of importance to those expressing milk at home around family and friends rather than healthcare workers. Studies are needed to determine factors of importance for women in their experiences of EE-BMF to develop and validate scales on BME experiences.

Factors Related to BME

Several studies have investigated the reasons for BME. In an analysis comparing results of the Perth Infant Feeding Study (PIFS) I and PIFS II, national longitudinal

surveys in Australia, Binns et al. (2006) found that breast milk expression was a management strategy for breastfeeding difficulties and discomfort given that the most common reasons for expressing were oversupply, engorgement, sore nipples, and mastitis. Storing milk, latch problems, and to have milk for someone else to feed to the infant were reported as well, but less commonly. Flaherman et al. (2016) had a similar conclusion and called BME “part of a strategic plan to improve breastfeeding” (p.293) as women in their study with milk supply concerns reported during focus group interviews that they used BME to increase their milk supply, supplement DBF when needed, and in place of DBF when encountering breastfeeding difficulties. Clemons & Amir (2010) also found in a survey study that women reported breastfeeding challenges as reasons for BME. In their sample of 903 women, 51.6% reported engorgement as a motive, however, a larger proportion 57.2% also reported storing extra breast milk as for BME.

In a prospective cohort study in China, Jiang et al. (2015) followed 384 women from birth to 6 months postpartum and questioned women about their feeding practices. They asked about reasons for BME and divided participants into groups based on feeding method (DBF, DBF with PE-BMF, and EE-ABMF) for data analysis. Similar to Clemons & Amir (2010), Binns et al. (2006), and Flaherman et al. (2016), participants reported engorgement and latch problems to be the most common problems in the early establishment of breastfeeding. However, Jiang et al.’s (2015) findings also included that the reasons for BME changed over the six-month time period of the study and that reasons varied by method of feeding. By six weeks postpartum, women who were combining DBF with PE-BMF practiced BME mainly due to oversupply (58%) and to store extra breast milk (38%) with less common reasons being latch or suck difficulties

(27%), to increase supply (26%), nipple pain (22%), mastitis (10%) and flat nipples (3.5%). In contrast, of the women practicing EE-BMF, most (88.5%) reported latch or suck problems, with some indicating flat nipples and mastitis (23% and 22%), some wanted others to have the opportunity to feed (31%) or cited returning to work (21%) as their reasons for expressing. Geraghty et al. (2012) also compared reasons for BME in participants who were either DBF or PE-BMF in the first month postpartum as part of a longitudinal cohort study. In contrast to Jiang et al.'s (2015) that breastfeeding problems were more commonly reported among those expressing breast milk, Geraghty et al. (2012) found no significant relationship between breastfeeding problems (e.g., perceived insufficient milk supply, latch issues) and feeding method.

Lacking in the studies performed by Geraghty et al. (2012), Flaherman et. al (2016), Clemons & Amir (2010), and Binns et al. (2006) was data on the proportion of infant feeds that were expressed breast milk. Therefore, it is unknown if these motivations are the same for women doing extensive amounts of BME as is the case for women practicing EE-EBMF. This could explain why in the Jiang et al.'s (2015) study in which participants practicing PE-BMF were compared to those EE-BMF there were differences in reasons for BME by feeding group but not in Geraghty et al.'s (2012) in which women practicing BME were not divided by PE-BMF and EE-BMF. The contradictory findings and the lack of studies exploring EE-EBMF indicate that more exploration of this feeding experience is warranted.

Felice et al. (2016) further divided the various reasons for BME listed as options on the IFPS II categorized them as elective or nonelective based on their previous qualitative explorations. They classified BME reasons of for mixing with food, to have an

emergency supply of milk, to donate to another baby as “elective”. “Non-elective” reasons included to relieve engorgement, nipples too sore to nurse, to increase milk supply, for feeding baby when participant did not want or could not breastfeed, and to keep milk supply when unable to nurse. The classification was based on the authors’ viewpoint that non-elective reasons were comprised of barriers or difficulties that were seemingly not within the mothers’ control that made expressing the only option if BMF was the goal. In a survey of mothers who were members of the Australian Breastfeeding Association as only 0.4% selected that expressing milk was a preferred method of feeding their infants (Clemons & Amir, 2010). While these findings may suggest that women feel compelled to express breast milk rather than choose BME as a feeding method, Felice et al. (2016) applied categories determined from a separate qualitative inquiry onto an existing survey and it is unclear whether the participants responding to the survey also would have classified their reasons as non-elective. The use of this classification system by these researchers implies that women do not autonomously choose this feeding method. The unique realities of women who EE-EBMF need to be heard to investigate how feeding choices are made.

Maternal and infant characteristics that were associated with higher likelihood of BME were identified in several studies. Most associations examined were between the practice of *any* breast milk expression and characteristics such as income, employment status, and birth characteristics, maternal body mass index (BMI) and feeding intentions while only two studies examined how the practice of *exclusive* breast milk expression was associated with these characteristics. Return to employment postpartum was found to be a predictor of breast milk expression in the United States (Geraghty et al., 2012;

Labiner-Wolfe et al., 2008) and in China (Bai et al., 2017; Jiang et al., 2015). Returning to work within 6 months of the infant's birth was strongly associated with an increase in likelihood of expressing by 4 weeks postpartum as evidenced by an adjusted odds ratio of 7.67 (Geraghty et al., 2012). Labiner-Wolfe et al. (2008) analyzed a sample of women in the U.S. who responded to the IFPS II (n=3606) and compared with women who were not employed in the previous 4 weeks to women who were employed and their BME practices between 1.5 and 4.5 months postpartum. A higher proportion of women who were employed reported regularly expressing breast milk (46% vs. 17.8%, $p<0.001$), while a lower proportion of employed mothers expressed only occasionally (34% vs. 47.2%, $p<0.001$), or not at all (20% vs. 35%, $p<0.001$). Women responding to the IFPS II were noted to be more highly educated, predominantly white, and with higher incomes than the general U.S. population, so these results cannot be generalized among employed women with different sociodemographic backgrounds. In a sample of 500 participants in Singapore, women who were employed during pregnancy were more likely to report BME postpartum (AOR=2.53) (Pang et al., 2017). Unlike Geraghty et al. (2012) and Labiner-Wolfe et al. (2008), Pang et al., (2017) only assessed employment status antenatally. These studies are limited in their generalizability due to samples of highly educated and higher income women. They also lacked samples of women who were EE-EBMF. Employment is likely to be a factor in BME decisions due to separation from infants, but the experience may be different for those with differing backgrounds, access to maternity leave, and proportion of expressed BMF. Studies are needed that explore BME within the context of women's lives to understand the interplay of employment and BME decisions among those who EE-EBMF.

Socioeconomic factors have been associated with likelihood of breast milk expression in several studies. In a prospective cohort study with 2450 participants, Bai and colleagues' (2017) used the highest monthly income as the reference. With each income bracket lower, there was a decrease in the odds of expressing at months one, two, and three months postpartum. The lowest odds of expression were among those making less than 15,000 Hong Kong Dollars per month (the equivalent of \$1928 USD at the time of the study) at 3 months postpartum with an adjusted odds ratio of 0.19. Similarly, in the U.S., participants making greater than 350% of the federal poverty line were more likely to be expressing breast milk compared to participants with incomes below 185% of the federal poverty line (OR=1.62, $p<0.05$) according to an examination of the IFPS II (Labiner-Wolfe et al., 2008). Felice et al. (2016) utilized the same dataset, and therefore had similar findings. Feeding expressed breast milk only was also associated with having a university education in one study (Pang et al., 2017). It appears from these results that socioeconomic factors such as higher income and educational attainment result in greater likelihood of BME. These studies did not include women who EE-EBMF, however, and mechanisms behind the association are unknown. In the U.S., women of lower socioeconomic status may have less access to supplies needed for BME or jobs that allow break time to do so. Exploration of their choices and inclusion of women of various socioeconomic levels who EE-EBMF is needed to understand this phenomenon.

It has also been shown that mothers without breastfeeding experience are more likely to express milk. According to the IFPS II, only 19.4% of mothers who had breastfed previously regularly expressed breast milk, while 37.4% of those without experience expressed regularly ($p<0.01$) (Labiner-Wolfe et al., 2008; Felice et al., 2016).

Pang et al. (2017) examined association with parity and found that primiparous mothers were 1.54 times more likely to express breast milk than multiparas. While these associations were with any breast milk expression, the trend is consistent in mothers who exclusively express as well as evidenced by decreased odds of exclusive expression at 1 month (OR=0.42), 2 months (OR=0.38), and 3 months (OR=0.42) among mothers with previous breastfeeding experience compared to those without (Bai et al., 2016). The association between weight and breast milk expression has also been investigated. Higher maternal BMI at 1 week postpartum increased the likelihood of expressing (AOR=1.28) as did each 100g decrease in infant birth weight (AOR=1.34) (Geraghty et al., 2012). In contrast, Leonard et al. (2011) found no difference in the proportion of women who tried to express milk across BMI categories of 2288 respondents to the IFPS II. Adjusting for covariates, it appeared that obese women had decreased odds of expressing successfully compared to overweight and normal weight women, but the association was not significant after adjustment. These associations between parity, experience, and weight show the various contextual factors that can impact likelihood of BME. Qualitative explorations are needed to understand how these factors shape these infant feeding decisions.

Theory Use

The literature review included a total of 36 articles spanning topics related to breast milk expression. There was a scarcity of research guided by theory. Of the 37, only 1 utilized theory. Johnson et al. (2009) analyzed audio diary entries from the first week after hospital discharge and follow-up interviews with 16 women in England. A feminist

poststructuralist theoretical perspective was used to explore the practice of BME. There were no theory-guided studies that explored EE-BMF.

Theory guides nurse researchers, the use of evidence-based practice interventions, help define goals, and assist in better understanding relationships (Smith & Parker, 2015). Theory based development of measurement tools can contribute to an instruments validity when concepts have been well-defined. Bai & Dinour (2017) cited the needed to develop measures well-aligned with theory constructs and to correctly and reliably study behaviors in relation to theory. Nurses, midwives, physicians, and lactation consultants have an opportunity to play a crucial role in the support of women who want or need to express breast milk, but better understanding of the relationships and outcomes are needed to provide recommendations. Utilizing theory that utilizes the concept of satisfaction and accounts for the diversity of infant feeding methods and experiences can help better understand these relationships in the context of breast milk expression. Yet, neither the MBFES nor the BMEE, measures of satisfaction are theoretically based nor is it known whether these measures would be valid in a population of exclusively expressing women due to the paucity of research including this population.

The Situation Specific Theory of Breastfeeding

The Situation-specific Theory of Breastfeeding (STB) was developed to provide a holistic view of breastfeeding decision-making and maintenance that incorporates aspects of social support and maternal perceptions beyond what can be described by commonly used theories such as the Theory of Planned Behavior (Nelson, 2006). Within the STB, breastfeeding is defined as “a method of infant feeding that involves an intimate, vulnerable relationship between a mother and infant that is personal, engrossing, and

physical, and requires commitment, adaptation, and support” (p.17). This contributes to the core concept of the theory “salutary breastfeeding”, defined as “breastfeeding that promotes the emotional, mental, and physical health of the mother, infant, and family” (p.19). The experience of nature is personal, is impacted by interactions between mother and infant, the mother and support networks, and the mother and her societal and situational contexts. Informed maternal decision-making can be facilitated by promoting agreement and harmony within these interactions to lead to a more positive breastfeeding experience. Criteria used to identify a salutary breastfeeding experience are a level of breastfeeding that: reflects informed decision-making and guidance that considers the individuality and unique risk-benefit ratios for the dyad, is manageable for the mother and family from their perspective related to maternal-infant readiness and capacity, is satisfying and enjoyable to both mother and infant, is empowering, is a balance between maternal and infant needs, and that strengthens relationships of the mother and infant while protecting other relationships.

The assumptions of this theory are that self-determination related to feeding decision-making is a right of families, the primary commitment of the nurse is to the patient, families have the right to complete and accurate information presented at their level of understanding, along with risks, benefits, and options to aid in informed decision-making, nurses are committed to patients as unique individuals requiring unique plans of care, and the nurse includes the patient in participation in planning and implementation of care (Nelson, 2006, p.18). Maternal and infant readiness and capacity for breast milk feeding are reflective of health status, characteristics, experience, knowledge, goals, and feeding behaviors. This is the state at which mothers and infants enter the decision-

making period prenatally or during the early postpartum period during and after which they encounter various networks. Conflict or congruity can be encountered in interaction with institutional networks (e.g., staff, policies, education, and counseling practices), informal psychosocial networks (e.g., family, partner, friends), or formal professional networks (e.g., nurses, physicians, lactation consultants). The levels of conflict or congruity encountered have the potential to impact the mother's perceptions and balance of maternal and infant well-being leading to either or more negative breastfeeding experience or a salutary breastfeeding experience. The theory proposes that a more salutary breastfeeding experience will lead to longer duration of exclusive breastfeeding and higher rates of breastfeeding, but studies test these proposed relationships and development of measurement instruments for salutary breastfeeding are needed.

This theory is fitting with a narrative design because it acknowledges that there are key points and interactions during the process of breastfeeding that may serve as turning points in a mother's journey toward a successful breastfeeding experience. The story-telling nature of narrative interviews, that often contain stories that can be placed in a chronological order with key players and turning points (Kim, 2016), will allow women to shed light on the validity of this assumption of the theory. Rather than using the theory to prescribe the interview process, this study will inform whether the theory has validity in describing the experiences of women who EE-BMF as it has not yet been used to study this population. Furthermore, the definition of salutary breastfeeding is closely aligned with the categories defined by Leff and colleagues (1994) related to successful breastfeeding in that there are physical and psychosocial elements for both mothers and infants that contribute to the mother's perception of a positive experience. Yet, this

previous definition and measurements of satisfaction were not derived from theory. The criteria of salutary breastfeeding additionally expand the concept of successful breastfeeding as previously defined with the components of decision-making and protection of other familial and supportive relationships which makes for a more holistic model of a positive experience. Combining an exploration of the experience with theory will strengthen and confirm validity of these concepts within a specific population of BMF mothers.

Limitations and Gaps

The findings from this review of the literature highlight important, well-established knowledge surrounding breastmilk expression along with critical gaps and conflicting evidence that need to be addressed. First, there is a lack of clarity in operational definitions of breast milk feeding methods. Infants receive breast milk via DBF, PE-BMF, EE-BMF, or a combination of methods. Without appropriate classification of feeding methods, it is unknown how structural and intrinsic factors impact the infant feeding experiences and choices of women practicing different methods of BMF. Additionally, applying the term “breastfeeding” to all methods of BMF, leads to assumptions that BMF pertains to DBF and suppresses the voices of women who express. Studies of the experiences of women who practice BME, especially EE-BMF, to further justify the need for a classification system that recognizes them as BMF women.

As shown in the review of literature, women express milk for a variety of reasons. Yet very few women in these studies practiced EE-BMF and their motivations and intentions may differ from those practicing PE-BMF. Qualitative interview findings confirmed quantitative survey data identifying that major reasons for BME include breast

or nipple problems, latch or suck problems, storing to be fed later or by others, or to increase supply. However, there was little exploration into how these factors impact mothers' overall experiences, how they changed over time, and how they shaped infant feeding decisions, especially in those that exclusively express. The majority of surveys that assessed reasons for BME were cross-sectional in nature, yet women's reasons and methods of feeding may change over time. This leads to a gap in knowledge surrounding reasons for expression as they relate to women's overall perception of their BMF feeding experience. There is especially a gap in this exploration in women who EE-BMF.

There was a consensus in the characteristics of mothers associated with breast milk expression. However, there was still much conflicting data surrounding the effects of BME on duration of BMF leading to a gap in understanding factors that may impact how long women EE-BMF. This is especially concerning given the findings of Keim et al (2019) and O'Sullivan et al. (2019) that national surveillance questionnaires used to track BMF in the U.S. may be inaccurate at determining duration of BMF in women who express breast milk. This evidence has made clear that we do not yet understand the impact of feeding mode on duration. Qualitative explorations are needed to determine women characterize their infant feeding methods and the factors that shape the trajectory of their BMF journey.

There are also gaps in the literature related to how societal contexts such as policy and healthcare shape women's infant feeding choices and experiences. National policy and healthcare changes may have made breast pumps more accessible and affordable and provide greater demand for them. Studies do show increasing prevalence in breast milk expression. Exclusive breast milk expression also increased, yet few studies examined

this phenomenon specifically. Moreover, data sets in the U.S. tended to be older, such as the IFPS II which is now over a decade old, having been collected between 2005 and 2007. In addition to a lack of quantitative data since major policy changes such as the ACA, there has been little qualitative exploration of BME behaviors and experiences, especially in women who EE-BMF, since these policy changes were enacted.

An additional gap in understanding of contextual factors that impact BME pertains to maternal employment. Protected breaktime for nursing mothers may also be making human milk feeding after return to work more feasible. Some studies found return to employment to be a factor associated with BME, however, Eglash and Malloy (2015) note that many women still find it difficult to express for the time needed to adequately maintain supply. Therefore, policies that encourage the use of breast pumps as a substitute for maternity leave reforms may cause working mothers to disproportionately hold the burden of BME. There have been few studies since these changes, and none have explored return to work as it relates to the experience of EE-BMF.

There is a gap in knowledge of the experience of women of color and women with low socioeconomic status who express milk. Most samples in the literature reviewed have been comprised of white, married women of high socioeconomic status which may not capture the experiences of all women who express breast milk. Women from lower socioeconomic backgrounds may have to return to employment earlier requiring early and frequent breast milk expression but also tend to have work environments less conducive to the time and space needed for breast milk expression. Even the Infant Feeding Practices Survey II (IFPS II) was noted to not be nationally representative with

respondents being predominantly Caucasian, having higher income, higher education, and of older ages. More research that targets exclusively expressing mothers, especially those of varied racial and sociodemographic backgrounds needs to be conducted. Studies related to satisfaction are also limited in their generalizability due to married, highly educated samples that in the U.S. have also been mostly white women. The voices of women of color and their perceptions of the experience of BME, specifically EE-BMF, are absent from the literature and need to be included to capture a fuller understanding of this experience. Purposive sampling of women of color who EE-BMF is needed.

There were also gaps in the literature related to outcomes related to breast milk expression for mothers and families. Some alluded to mothers' dissatisfaction with the experience of breastmilk expression through negative feelings and perceptions, however research on outcomes has still largely been focused on exclusivity and duration of breastfeeding rather than maternal psychosocial factors. Effects on maternal mental health, fatigue, and sleep were not assessed. It was noted that the time needed for milk expression was inconvenient and could affect mothers' perceptions of bonding time, yet this may affect social roles and family relationships as well. These aspects were not discussed in the literature and reflect the omission of the experiences of mothers who exclusively express. While expressing occasionally or while at work may not impact the balance of home life, mothers who express during all parts of the day may manage these roles and relationships differently and have differing support needs to aid in that management. The absence of this perspective from the literature has created a gap in our knowledge of how EE-BMF impacts women's lives and therefore makes healthcare providers less able to support them. This study will fill this gap by exploring the

experience of women of EE-BMF in its entirety to gain an understanding of the realities of these women and their lives.

There is a gap in knowledge related to what constitutes a positive BMF experience from the perspectives of women who EE-BMF. The concept of Salutory Breastfeeding offers a more holistic view of a positive BMF experience, but there is a lack of research confirming the validity of the construct. Since its inception, the theory has not been used to guide explorations of the experience of breast milk feeding. While offering a more limited view of the experience, satisfaction has been explored, but not among women practicing EE-BMF. Measurement of satisfaction has also been limited to samples that are either directly breastfeeding, formula feeding, or designed for use in only the early postpartum time frame. Single-item measures of satisfaction lack clear definition of the construct being measured making the validity of the results questionable. This may explain why there are inconsistencies in factors contributing to satisfaction and the lack of efficacy of interventions aimed at improving satisfaction. Neither the MBFES nor the BMEE are theory-based. They are also not validated in women who EE-BMF. There is a need for examination of the experience of exclusive expression from the maternal perspective that can be combined with theory for future measurement of satisfaction in this population.

This study will begin to close these gaps by gaining the perspectives of women who EE-BMF, who have previously been omitted from the literature. This exploration using the Situation-Specific Theory of Breastfeeding will determine whether there is evidence of the construct of salutory breastfeeding in the narratives of women's experiences of EE-BMF. Additionally, by obtaining narrative accounts of women's

whole feeding experience, this study can illuminate contextual, structural, and intrinsic factors and events that shape BMF feeding decisions and behaviors.

Chapter 3 Methods

Philosophical Underpinnings

Methods of inquiry are guided by sets of beliefs, or paradigm, about the nature of knowledge and how that knowledge is obtained. These beliefs consist of the epistemological and ontological views of the researcher. The ontological position of the researcher refers to what reality consists of while epistemology refers to beliefs about how knowledge of that reality can be obtained (Scotland, 2012). These beliefs shape the questions posed by researchers and their methods of answering them. In other words, how the researcher believes reality exists determines their approach to obtaining that knowledge.

Frequently used in scientific research, the positivist paradigm is one in which there is a singular and objective reality that can become knowable by an impartial researcher, free from context and values (Scotland, 2012). This paradigm guides the researcher to approaches utilizing indicators as representations of variables identified by the researcher to operationalize, measure, and explain phenomena (Goertz & Mahoney, 2012). These methods have been used to quantitatively describe relationships between factors influencing breastfeeding intentions, duration, and exclusivity, and satisfaction. However, positivism assumes a concrete, singular experience of infant feeding and satisfaction. In actuality, a mother's infant feeding experience is multifaceted. For example, the physical reality of breastfeeding differs between mothers as evidenced by whether breast milk is provided directly at the breast or expressed. Mothers also exist within diverse social contexts with varying value beliefs. Therefore, mothers' perspectives of

infant feeding satisfaction are complex and abstract. Without first defining the meaning of this experience from the mothers' perspectives, we cannot yet accurately identify indicators that best measure satisfaction or other factors important to women who express milk. Thus, this ontological standpoint within the positivist paradigm is not apt for inquiry into mothers' unique breastfeeding experiences.

Conversely, a constructivist paradigm acknowledges multiple realities that are inherently linked to the contexts in which they are experienced. Knowledge of these realities can only be constructed from perspectives from the lived experience and an interactive process between the researcher and respondent (Guba & Lincoln, 1982). Value systems are evident in all aspects of the research process from the constructivist point of view and necessitate the use of reflexivity to remain true to the voices of the participants (Broido & Manning, 2002; Guba & Lincoln, 1982)

Constructivism assumes an interactive process where participants create knowledge. However, Scotland (2012) points out that the inherent values and biases of the researcher, historical, and social contexts of the research have the potential to increase the vulnerability of the researcher's interpretation imposed on the participants. This is especially the case in populations (e.g., women and people of color) whose voices have been underrepresented or suppressed. Therefore, I have chosen a feminist philosophical approach for this study. In using this form of constructivism, I will attempt to minimize the risk of bias, by centering the research on breastfeeding women, their lived experiences with infant feeding, and the contexts that frame those experiences (Broido & Manning, 2002).

Feminist Philosophy

As females are uniquely able to produce breast milk, it may appear implausible that there has been a lack of women's voices in our current knowledge of the breastfeeding experience of mothers who exclusively express. Indeed, breastfeeding is fundamentally a feminist issue as it relates to women's bodies. However, the "breast is best" mentality prevalent in society has centered breastfeeding promotion and research around what is best for the infant (Volk & Franklin, 2020), ignoring the experiences and enjoyment of infant feeding for women. There are opposing views within the feminist philosophy related to breastfeeding. Breastfeeding has been viewed by feminists as empowering; yet placing the infants' needs at the center of breastfeeding reduces women's sovereignty over their own bodies and may ignore the importance of their own personal fulfillment (Badinter, 2012; Volk & Franklin, 2020). Additionally, women are faced with conflicting demands as they navigate the bodily commitment required to feed breast milk while maintaining personal identity in the workforce (Lee, 2018).

As noted in the literature, including data from my completed preliminary study (Chapter 4), societal definitions of breastfeeding as feeding directly at breast have placed limitations on how women define their infant feeding experiences. Friedman (2009) calls for a feminist view of breastfeeding that utilizes "language of choice, acknowledging the tremendous physical and emotional impact on mothers" (p.27). The unique voices of these women and their experiences of satisfaction have not been heard and their choice to exclusively express breast milk is not widely included in current societal definition of breastfeeding. As such, care must be taken when constructing knowledge of this phenomenon to not further reduce the value of the individuality of women's experiences

using societal and historical interpretations. Therefore, research from a feminist philosophical perspective is necessary to ensure that the voices of women whose infant feeding method has been traditionally underrepresented in the breastfeeding literature are heard.

Research Design

A qualitative, descriptive design utilizing narrative method was used to examine the lived experiences of mothers who exclusively express breast milk from a feminist theoretical perspective. In narrative inquiry, the researcher encourages participants to engage in storytelling to provide detailed accounts of an experience (Petty et al., 2012). Though not necessarily told in chronological order, the stories have a temporal component, plot structure, and context (Creswell & Poth, 2018; Kim, 2016). Knowledge is created through the intersubjective, meaning-making process between storyteller and listener (Chase, 2018).

Narrative methods are well-suited for research from a constructivist, and more specifically feminist, epistemological standpoint because personal narratives of participants' lived experiences can be used to gain insight into phenomena that have been suppressed in scientific research (Chase, 2018). Guba and Lincoln (1982) suggest that personal realities "must be dealt with in a holistic fashion" (p.239). By providing a platform for mothers to tell their stories of infant feeding from beginning to end, I can gain an understanding of the experiences, influences, and contexts that contribute to feelings of breastfeeding satisfaction or dissatisfaction among mothers who exclusively express. Narratives can be useful for highlighting turning points or transitions within stories (Creswell & Poth, 2018) which lends itself to investigating the stories of women

who had intended to directly breast, but ultimately ended up exclusively expressing breastmilk.

The concepts of salutary breastfeeding and breastfeeding satisfaction require further definition within the context of breast milk expression. Becker (1982) notes that through individual narratives of experiences, differences can be used to bring new meaning to concepts of existing theory and perhaps redefine the dependent variables of theory. For example, breastfeeding researchers have defined the concept of breastfeeding satisfaction based on the experiences of mothers who have fed at breast and the predominant dependent variables in quantitative breastfeeding research are exclusivity and duration. Mothers who exclusively express breast milk may have differing experiences of satisfaction that need to be incorporated into existing theories or new theories created. Therefore, a qualitative narrative approach is necessary in defining breastfeeding satisfaction from the mother's perspectives.

Research Questions

The research questions to be addressed in this qualitative study are:

1. What is the feeding experience for women who exclusively express breast milk?
2. How do women describe their infant feeding goals and intentions?
3. What factors influence women's experiences of infant feeding?
4. Do the narratives of women who exclusively express breast milk detail characteristics of salutary breastfeeding?

Participants and Setting

Purposive sampling was employed to capture a diverse sample of participants that were practicing or had practiced EE-EBMF for their infant within the past year.

Purposive, maximum variation sampling to obtain diverse perspectives can improve the external validity, namely the transferability, of the findings (Petty et al., 2012). Two groups of women, those who intended to EE-EBMF and those who intended to directly breastfeed but ultimately arrived at EE-EBMF, will be invited to participate in this study.

Social media, namely Facebook (Facebook, 2020), was used for recruitment. Facebook (2020) will be used because of its potential to reach large numbers of people within a short period of time. This method of recruitment was successful for recruiting 15 participants during a preliminary study detailed in Chapter 4 from four Facebook groups for mothers. One of the limitations of the preliminary study was the lack of racial diversity within the sample. Therefore, efforts will be made to post in Facebook groups designed for breastfeeding mothers of color (e.g., African American Breastfeeding Network, Breastfeeding Support Group for Black Moms, Black Breastfeeding Mamas Circle Group).

After obtaining approval from Marquette University's Institutional Review Board, a recruitment flyer describing the study's purpose, eligibility criteria, and a link with QR code to an eligibility screening survey was posted in groups whose members are women who express breast milk. Women were eligible to participate if they are age 18 or older, could speak and read English, and had given birth to a term (greater than or equal to 37 weeks gestation) singleton infant within a year. They must have exclusively fed their own breast milk (no donor milk) for at least two weeks by only expressing their milk and had

no maternal or neonatal complications at birth requiring separation of the mother and infant (e.g., Neonatal Intensive Care Unit admission). To complete the interview, they must also have had access to a telephone or access to a computer with stable internet connection. Mothers of multiples or infants with complications including prematurity encounter additional barriers to breastfeeding leading to different experiences unique from those of term infants; therefore, were excluded from this study. Additionally, literature on the experience of expressing milk in the NICU is extensive; yet there is a gap in the literature on EE-BMF for term infants.

In a narrative design, the sample size is more dependent on the quality and depth of detail in each narrative rather than a certain suggested number of participants and few guidelines exist for sample size in qualitative research (Creswell & Poth, 2018; Guest et al., 2006; Kuzel, 1999). Therefore, detailed descriptions of accounts were obtained, and recruitment continued until there was appropriate data saturation. While there is no consensus on methods for measurement of saturation, it is defined as the point when new information obtained during data collection produces little change to the existing codes and themes that have emerged (Guest et al., 2006). Kuzel (1999) suggests that saturation can be achieved in as few as 6 units of analysis for a homogenous sample and approximately 12 to 20 for samples chosen for maximum variation. In this study, data collection continued until saturation was reached. There are few guidelines on methods of assessing saturation other than reaching a point when little new codes are developed, information relayed becomes redundant, and an adequate level of both depth and breadth of information has been reached (Kim, 2016). Therefore, recruitment continued until there was appropriate data saturation.

Strategies were employed to encourage participation in the study. Due to the impersonal nature of flyers and social media posts, strategies were be employed to create trust and interest. Researchers have found contextual cues (i.e. researcher information, affiliation, photos) can build trust can increase participation (Pan et al., 2014); therefore, study information flyers included my photo and my background as a nurse, IBCLC, and PhD student. Additionally, financial incentives also encourage participation in research (Eleanor & Cong, 2013; Kennedy & Ouimet, 2014). Therefore, \$20 gift card will be distributed to participants upon completion of the interview.

Data Collection

To screen for eligibility, interested women were directed to a Qualtrics survey (Qualtrics, 2019) that first described the requirements for participation and confirmed continued interest in participation. Women with continued interest meeting eligibility criteria were asked for a phone number and email address to be contacted if eligibility criteria were met. Those who do not confirm interest or did not meet criteria were informed that they are ineligible and no further information was collected. Potential participants completing the survey were emailed a consent form to be read prior to the interview. The email included information regarding interview scheduling.

Eligible women participated in individual narrative interviews using Microsoft Teams (Microsoft Corporation, 2020). The option of audio only or videoconference was based on each participant's preference, internet accessibility, and access to devices capable of using Teams video software. Participants without access to internet or the Teams application software could participate in Teams interviews with phone audio only by calling a toll-free number with access code provided for each Teams meeting.

Advantages of conducting telephone or videoconference interviews as an alternative to face-to-face interviews are the ability to access participants across a wider geographical area, convenience in scheduling, decreased needs for transportation, and compliance with social distancing recommendations during the current COVID-19 pandemic.

Videoconferencing also allows for the ability to collect nonverbal data such as body language or facial expressions that could be of importance in providing context to participants' narratives despite the inability to meet in person.

At the time of the audio or video-recorded interview, I read the consent form and obtained verbal consent prior to the start. Interviews lasted between 30 and 60 minutes. Participants were asked to share their story of infant feeding experiences in their own words using the prompt: "Tell me the about feeding your baby from the earliest time you thought about feeding your baby all the way until now." Probing questions were used as needed to obtain additional information related to intention and satisfaction related to the experience. The following probing questions were developed based on the criteria for salutary breastfeeding in the Situation Specific Theory of Breastfeeding (Nelson, 2006). Probing questions include "Tell me about:

- how you made decisions about feeding your baby."
- your daily life while pumping for your baby."
- your feelings about feeding pumped milk."
- any events, situations that changed how you felt about feeding your baby."
- your relationships with family and friends during your pumping experience."

Interviews were concluded with the open-ended question “What else would you like to share about pumping for your baby?” After completion of the interview, participants will be e-mailed a \$20 gift card for Amazon, Target, or Walmart depending on preference of the participant. Interviews will be audio- or video-recorded depending on method. Participant confidentiality was protected by assigning participant numbers and all documents and recordings were de-identified and kept in a secure, password protected storage system. Recordings were transcribed by Microsoft Teams. In addition to the recorded narratives, a short questionnaire (Figure 1) was used to gather demographical data was administered verbally as I recorded answers.

Figure 1 Demographic Profile Survey

<p>1. Marital Status:</p> <p><input type="checkbox"/> Single</p> <p><input type="checkbox"/> Married</p> <p><input type="checkbox"/> Separated</p> <p><input type="checkbox"/> Divorced</p> <p><input type="checkbox"/> Widowed</p>	<p>7. Were you employed outside of the home prior to your child's birth?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>
<p>2. Highest education level completed:</p> <p><input type="checkbox"/> Some high school</p> <p><input type="checkbox"/> High school diploma</p> <p><input type="checkbox"/> GED</p> <p><input type="checkbox"/> Some college</p> <p><input type="checkbox"/> College degree</p> <p><input type="checkbox"/> Graduate school or higher</p>	<p>8. If you answered yes to question #7, how many weeks did/will you take off before returning?</p> <p><input type="checkbox"/> _____ weeks</p> <p><input type="checkbox"/> I do not know</p> <p><input type="checkbox"/> I do not plan on returning</p> <p><input type="checkbox"/> N/A</p>
<p>3. Household income:</p> <p><input type="checkbox"/> Under \$20,000</p> <p><input type="checkbox"/> \$20,001-\$40,000</p> <p><input type="checkbox"/> \$40,001-\$60,000</p> <p><input type="checkbox"/> \$60,001-\$80,000</p> <p><input type="checkbox"/> \$80,000 and above</p>	<p>9. What is your race/ethnicity?</p> <p><input type="checkbox"/> Asian/Indian/Pacific Islander</p> <p><input type="checkbox"/> Black/African American</p> <p><input type="checkbox"/> Hispanic</p> <p><input type="checkbox"/> Native American</p> <p><input type="checkbox"/> Non-Hispanic White</p> <p><input type="checkbox"/> Mixed Race</p> <p><input type="checkbox"/> Other</p>
<p>4. When was your baby born?</p> <p>____/____ (mm/dd)</p>	<p>10. How was your baby born?</p> <p><input type="checkbox"/> Vaginal</p> <p><input type="checkbox"/> Planned Cesarean</p> <p><input type="checkbox"/> Unplanned Cesarean</p>
<p>5. How many weeks pregnant were you when you delivered?</p> <p>_____ weeks</p>	
<p>6. How long did you exclusively feed your baby breast milk? ("Exclusive" means that your baby was receiving only breast milk with no formula, juice, water, or complementary foods)</p> <p>_____ days _____ weeks _____ month</p>	
<p>11. Prior to your child being born, did you plan to feed breast milk, and how?</p> <p><input type="checkbox"/> Yes, directly breastfeed only</p> <p><input type="checkbox"/> Yes, mostly direct breastfeed and some pumped milk</p> <p><input type="checkbox"/> Yes, mostly pumped milk and some direct breastfeeding</p> <p><input type="checkbox"/> Yes, pumped milk only</p> <p><input type="checkbox"/> No</p>	
<p>12. Is this your first baby? _____ yes _____ no</p>	
<p>12a. If not, how many children do you have? _____</p> <p>and how were your previous children fed? _____</p>	

Data Analysis

In narrative inquiry, the participants' stories as told from their own perspective are the units of analysis from which the researcher gains knowledge about their experience. Additionally, observation of participants during interviews offers deeper contextualization of the narratives contributing a detailed description necessary for transferability (Petty et al., 2012). Therefore, notes were taken during interviews regarding nonverbal cues such as tone of voice, body language, and facial expressions, when applicable. These notes were added to the transcribed interviews. Analysis of this data began concurrently during data collection. After completion of the interview, an audit trail was kept that contained the development of codes and themes beginning to emerge from the data collected during each interview. In addition to the audit trail, memos became part of a reflexive journal to self-reflect on factors that could influence my interpretation of the narrative. As reflexivity is important in narrative research due to the intersubjective nature of knowledge creation, transparency about what is known about one's self contributes to the confirmability, dependability, and credibility of the products of the research (Bishop & Shepherd, 2011; Crawford & Kimmel, 1999; Petty et al., 2012). For example, as a healthcare provider, I may be biased toward an emphasis on exclusive breast milk feeding for six months. However, this may not be a goal of women who EE-BMF and acknowledging this potential bias aided in gathering women's voices about goals rather than my own.

After transcription, the interviews were read in their entirety to gain familiarity with the text and to confirm accuracy and ensure dependability of the data. Thematic analysis (Creswell & Poth, 2018; Ravitch & Carl, 2016) began by compiling notes and

summaries taken during interviews to develop an initial coding schema and applying this coding schema to each narrative. Code generation and refinement continued throughout the analysis with data management using NVivo software (International, 2020). Codes were then organized and classified into themes. Comparisons were made between groups and within groups (Ayres et al., 2003) to identify commonalities and differences in infant feeding experiences and behaviors based on feeding intention. Codes and themes were discussed with an expert in narrative analysis to enhance rigor. A selection of participants who agreed to be contacted again had an opportunity to review the themes to confirm or dispute the validity of the interpretation (Birt et. al., 2016). Demographic data was analyzed using descriptive statistics in Microsoft Excel.

Steps were taken to ensure the trustworthiness. Guba and Lincoln (1982) outlined the following terms as markers of trustworthiness in qualitative research: confirmability, dependability, credibility, and transferability. Confirmability speaks to whether the findings genuinely arise from the inquiry with little bias from the researcher. This was attained using the audit trail and reflexive journaling to trace themes, codes, and interpretations back to original pieces of data. The audit trail and journal also served to increase dependability, or the degree to which the research could be repeated. Credibility refers to whether the participants would find the interpretations and conclusions of the researcher to be valid representations of their experiences. Peer debriefing with an expert in narrative research enhanced this study's credibility. To enhance the credibility of this study, a selection of participants who agreed to be contacted again were asked to review themes to confirm that they were accurate representations of their experiences. Finally, transferability, or the ability to use findings in similar contexts was enhanced by

purposively sampling to achieve maximal variation in the sample and offering thick description of the narratives to facilitate judgements about applicability.

Conclusion

Narrative research design aligns with the epistemological and ontological beliefs that knowledge of the experience of feeding exclusively expressed breastmilk must come the lived experience of mothers. The feminist philosophy underpinning the study provided a platform for the lived experiences of mothers who exclusively express to shed light on the impacts of breastfeeding intentions, duration, exclusivity, and satisfaction for women who express. The use of Facebook and Teams make this study unique in that a larger population of women will have the opportunity to participate. From a larger population, a more diverse sample can be selected to strengthen the literature surrounding the experiences of mothers who exclusively express.

Chapter 4: Findings

Introduction

There is a gap in knowledge related to the experiences of women who practice exclusive expression of breast milk for term infants. To explore and gain a better understanding of these experiences, I conducted two narrative inquiries from a feminist philosophical perspective. This chapter contains manuscripts that detail each of these studies and the findings of each.

The first manuscript presents findings from a study in which I conducted interviews with participants practicing different feeding methods and compared the experiences of those who practice direct breastfeeding and with experiences of those who practiced exclusive expression. This study demonstrated the feasibility of using social media as a recruitment tool to purposively sample women who practiced exclusive expression for the second study. After the first study, I noted that all but one of the participants that practiced exclusive expression had prenatally intended to directly breastfeed. Therefore, I determined that there was a need to purposively sample participants who had intended to practice exclusive expression along with those that had prenatal intentions to directly breastfeed to compare these experiences. Manuscript two details the findings of this study.

Comparing Experiences of Feeding Breast Milk by Direct Breastfeeding and Exclusive Expression

Objective: To provide understanding about feeding experiences of women who provide breast milk through direct breastfeeding, exclusive expression, or a combination, and to compare each in terms of maternal satisfaction. **Design:** A qualitative, descriptive design. **Setting:** Participants were recruited from motherhood and breastfeeding support groups on Facebook. Groups had state- or national- based memberships. **Participants:** A total of 15 women who had given birth to a healthy, term infant within the past 12 months and had fed breast milk for at least 2 weeks participated. **Methods:** Narrative interviews were used to gather experiences from the participants' perspectives. Questions were guided by the Situation Specific Theory of Breastfeeding. Interviews were analyzed for themes that were compared between feeding groups. **Results:** Three themes emerged describing breast milk feeding journeys of the participants: *Facing Challenges, Not Alone on the Journey*, and *Finding Joy in a Common Goal*. Within themes, there were nine subthemes: *Sources of Fatigue, Finding Relief, Body Failure, Pumping in Isolation, Partner Support, Social Support, Sources of Enjoyment, Mixed Feelings, and Bonding*. **Conclusion:** Regardless of the method, mothers who provide breast milk share common experiences and feelings of satisfaction. Expressed breast milk feeding offers some a way to provide the benefits of breast milk while preserving a balance between maternal and infant physical and mental health needs. Healthcare professionals' preparation to discuss various methods of breast milk feeding is crucial to supporting mothers in meeting their individualized needs.

Keywords: human milk, breast feeding, breast milk expression, lactation, bottle feeding, maternal health, qualitative research

Key Messages

1. The practice of exclusive expression is growing, but the experience of women who use this method for breast milk feeding is not well understood.
2. Women enjoy being able to provide breast milk even when their experience does not align with their prenatal intentions.
3. Clinician support of breast milk feeding should include practical and informational support, regardless of method, without contributing to pressure and guilt.

Comparing Experiences of Feeding Breast milk by Direct Breastfeeding and Exclusive Expression

It is recommended that infants receive breast milk for the first six months of life (American Academy of Pediatrics, 2012; American College of Obstetricians and Gynecologists, 2018; World Health Organization, 2002). Yet, in the U.S., this standard is not met (Centers for Disease Control and Prevention [CDC], 2018). Nationally, only 25% of infants are exclusively fed (e.g., no supplementation with formula, water, etc.) breast milk at 6-months, a decrease from 47% at 3 months (CDC, 2018). Although 25% exclusivity meets Healthy People 2020 breastfeeding objectives (U.S. Department of Health and Human Services, n.d.), it is a dismal number considering exclusive breast milk feeding for the first 6-months of life is a national and global standard. This downward trend in breast milk feeding-rates over time suggests factors exist that impact exclusive breastfeeding resulting in early discontinuation and overall breastfeeding cessation. Influences such as professional and social support, self-efficacy, infant feeding intentions, and satisfaction have been shown to affect breastfeeding decisions and duration (Cooke et al., 2003; Liu et al., 2017; Schmied et al., 2011).

On the other hand, research examining the impact of breast milk feeding method (direct breastfeeding or exclusive expression) and maternal satisfaction on breast milk feeding exclusivity and duration specifically in term infants is vastly limited. Direct breastfeeding (DBF) occurs when the infant receives breast milk directly from the breast. In contrast, exclusive expression is the practice of providing only breast milk that has been expressed and fed to the infant via a bottle. The latter has been widely supported in cases where direct breastfeeding is not possible due to maternal or infant illness, infant

prematurity, or to establish milk supply (AWHONN, 2015; Eglash & Malloy, 2015; Flaherman & Lee, 2013; Ryan et al., 2013; Spatz & Edwards, 2016). However, increasing numbers of mothers are electing exclusive expression for healthy, term infants (Johns et al., 2013). Some data suggests that exclusive expression leads to early weaning (D. L. Bai et al., 2017; Geraghty, Davidson, Tabangin, & Morrow, 2012; Jiang et al., 2015), yet there is a paucity of research on the experience of exclusive expression for term infants from the woman's perspective. Factors that negatively impact breast milk feeding exclusivity and duration among women providing any expressed milk include inconvenience of expressing (Felice et al., 2017), pain or other reactions caused by breast pumps (Flaherman et al., 2016; Johns et al., 2016), and a general dissatisfaction with expressing (Clemons & Amir, 2010). The findings neglected contextual factors that may be involved in the maternal experience and most evidence on exclusive expression is derived from special populations (e.g., preterm, or low birthweight infants).

In an effort to quantify maternal breastfeeding experience including aspects of satisfaction and enjoyment, Leff and colleagues (1994) developed the Maternal Breastfeeding Evaluation Scale (MBFES). Researchers using this scale showed that higher scores are associated with exclusive breastfeeding at five months (Hongo et al., 2017). Positive maternal attitudes toward breastfeeding have been associated with exclusive breast milk feeding outcomes (de Jager et al., 2013; Wouk et al., 2020). Additionally, among women feeding breast milk at two months postpartum, positive emotions were associated with exclusive breast milk feeding at six months and may facilitate maternal mental health throughout the first postpartum year (Wouk et al., 2019; Wouk et al., 2020). These studies as well as national breastfeeding statistics do not

explicitly identify exclusive expression as a feeding method. Furthermore, the MBFES includes language related to direct breastfeeding and have failed to explore these relationships in terms of exclusive expression (Kestler-Peleg et. al, 2015). The omission of exclusive expression as a feeding method as a factor may impact our understanding of the relationship between maternal infant feeding experience and maternal feeding satisfaction. With implications for infant and maternal health, it is important researchers gain an understanding of breast milk feeding experience in all forms.

Most studies exploring mothers' experiences with infant feeding have focused on direct breastfeeding in general populations and exclusive expression for special populations, but there is a dearth of research on maternal satisfaction of exclusive expression for healthy term infants. It is critical to understand the experiences of women who use various methods to provide breast milk to their healthy term infants in order to further investigate impacts on maternal satisfaction, exclusivity, and duration. Therefore, the purpose of this study was 1) to explore the infant feeding experiences of women who practice direct breastfeeding, exclusive expression, or combination of methods to provide breast milk to their infants, and 2) compare these experiences in terms of maternal satisfaction.

Methods

Design

To examine factors related to maternal satisfaction, a qualitative, design utilizing a narrative approach was selected to examine the experiences of mothers who use exclusive expression, who directly breastfeed, and those who use a combination of

feeding methods. In narrative inquiry, the participants' stories as told from their own perspective are the units of analysis from which the researcher can gain knowledge about their experience through analyzing narratives for ways participants assign meaning to events shared about their breast milk feeding story. Participants' stories shed light on how they perceive themselves and their experiences.

Core constructs of the Situation-Specific Theory of Breastfeeding (Nelson, 2006) guided the study. The principal concept of this theory is salutary breastfeeding, a view of successful breastfeeding that incorporates the subjective aspects of infant feeding such as satisfaction, enjoyment, role and identity, and manageability. An assumption of this theory is that a more positive breastfeeding experience can be reached through breastfeeding support that acknowledges the need for a balance between the maternal subjective experience, the importance of duration, and the autonomy of maternal decision-making. The Situation Specific Theory of Breastfeeding is consistent with a narrative approach in its acknowledgement of the importance of the individual's unique experience.

Setting and Participants

Ethical approval was granted by the Primary Investigator's (PI) university Institutional Review Board. Between January- February 2020, potential participants were recruited using a social media outlet. A recruitment flyer was posted to 4 Facebook groups whose members included those practicing direct breastfeeding, exclusive expression, and combination feeding. Three of the groups' membership were based in a midwestern state and at the time of recruitment, memberships totaled 768, 1,388, and

4,887, respectively. The fourth group included members from across the nation (28,000 members).

Women were invited to participate if they had given birth to a term (>37weeks) infant in the preceding twelve months and had exclusively fed only their own breast milk for at least two weeks via direct breastfeeding, exclusive expression, or combination feeding. Additional inclusion criteria consisted of being age 18 or older, able to speak and read English, and had no maternal or neonatal complications at birth requiring separation of the mother and infant (e.g., Neonatal Intensive Care Unit admission).

Study Procedure

After contacting the PI, each potential participant was screened for eligibility based on inclusion criteria. Interviews were arranged with participants meeting inclusion criteria and expressing interest in participation. Interview mode (phone or in-person) was based on the participant's preference and proximity to the researcher's location. Participants gave verbal consent to be interviewed and audio-recorded after reading a consent form after which they completed a demographic survey. The PI began each interview by explaining that the purpose was to listen to women's stories of their infant feeding experiences. Interviews opened with the prompt, "Tell me about your infant feeding experience, from the very beginning when you considered how you would feed your baby until now." Probing questions were developed using the Situation Specific Theory of Breastfeeding as a guide to obtain more information related to personal enjoyment, satisfaction, and feelings of success related to the feeding experience. Examples of probing questions are listed in Table 1.

Data Analysis

Participant demographic data was analyzed using descriptive statistics. The PI and another research team member performed the qualitative data analysis. Audio-recordings were transcribed using NVivo automated transcription service (QSR International, 2020) and checked for accuracy. Researchers independently read the transcripts in their entirety to familiarize themselves with the stories told by the participants (Ravitch & Carl, 2016). After a complete reading, relevant segments of the texts were assigned codes. The authors compared their individually coded text to discuss and compare. A consensus on codes was developed through discussion, after which similar codes were organized into categories and subsequently into themes. Comparisons were made between groups based on feeding method to determine differences in satisfaction, enjoyment, and overall experiences.

Results

Participants

Fifteen women participated in this study. A summary of the participants' demographics is provided in Table 2. The sample was mostly white, had a partial college education or higher, of high socioeconomic status, and were married. The average infant age was 7-months. The average duration of exclusive breast milk feeding was 4.8 months ranging from 2-months to 7-months. Six participants were still providing breast milk at the time of the interview. Prenatally, all participants had intentions to feed breast milk, but many ($n = 8$) did not feed in the manner they had intended. Of the six participants who planned to directly breastfeed exclusively, half exclusively expressed. Eight planned

to feed a combination of expressed milk and direct breastfeeding: three continued combination feeding, three directly breastfed, and two exclusively expressed. Only one participant intended to and carried out exclusive expression.

Themes

When comparing the stories of breast milk feeding, three themes emerged: *Facing Challenges*, *Not Alone on the Journey*, and *Finding Joy in a Common Goal*. Within these themes, there were nine subthemes: *Sources of Fatigue*, *Finding Relief*, *Body Failure*, *Pumping in Isolation*, *Partner Support*, *Social Support*, *Sources of Enjoyment*, *Mixed Feelings*, and *Bonding*. A summary of themes, subthemes, and distinguishing characteristics are provided in Table 3. Within each theme and subtheme, key differences were noted between participants who directly breastfed and those who exclusively expressed.

Facing Challenges

Regardless of feeding method, breast milk feeding was described as challenging by all participants. They described experiencing sources of fatigue especially during the early postpartum period. Through various mechanisms, they were able to persevere in their breast milk feeding journeys. As all but one intended to feed at the breast, obtaining a proper latch or not in the early weeks was a key turning point in determining the trajectory of participants' experiences. Once participants withstood these early challenges, many felt that their final feeding method made breast milk feeding easier for them.

Sources of Fatigue. Frequency of feedings was described as a significant source of fatigue and exhaustion in the early weeks for both groups. Participants who direct breastfed, either as a sole feeding method or in combination with expressing, described having a good start to breast milk feeding. They had no latch issues and produced adequate quantities of breast milk yet found frequent feedings to be exhausting. One participant described being “exhausted and sleep deprived” when “there’d be nights like in the middle of the night when my baby wakes up every two to three hours. It [would] be nice if someone else could feed him.” Another felt that during the postpartum hospital stay, the task of tracking feeds seemed like “undue stress, unless the baby’s really losing weight or there [is] some kind of health concern.” After overcoming early challenges, women feeding directly at the breast faced later frustrations. These included returning to work and infants biting at the breast during feedings. Even when latch was not an issue, some participants switched to exclusive expression because they found frequent feedings at the breast and fatigue to be overwhelming:

I probably exclusively breastfed [direct breastfed] for about 2-weeks. After that, I think everything took a toll on me. It was a lot trying to wake up and have her latch. So that just became overwhelming to me... She latched really well. I was probably breastfeeding every two hours and that was really challenging . . . I just really needed to sleep.

Body Failing. All except one of the participants who were exclusively expressing intended to direct breastfeed. The early postpartum weeks for these participants were filled with latch attempts and uncertainty about milk supply in addition to the fatigue from frequent feedings. Some participants sought assistance through lactation

consultations, used nipple shields, and continued attempts to latch. One participant stated that she was “pretty much traumatized from it [latching].” When these attempts failed to produce expected infant weight gain or relieve nipple pain, feelings of frustration and disappointed in their bodies were noted. Hearing that breastfeeding can be difficult, one participant went in with the expectation that she “would be OK if [she] couldn’t get it.” However, as she attempted to direct breastfeed, she reported being “really disappointed in myself and just frustrated . . . it was my fault that [baby] couldn’t get it because of my nipples being too flat”. Another echoed there “was some frustration when we found out she wasn’t taking or getting anything and like . . . I was constantly feeling like what am I doing wrong?” Yet another said her body was “not doing what it’s supposed to do...I kind of felt inadequate.”

Pumping in Isolation. After switching to exclusive expression, participants were pressured throughout their journeys to “just keep on trying [to latch]” or “just stick with [direct breastfeeding]” by family, friends, and healthcare providers which left them feeling alone as exclusive expressers. Later, they encountered an inability to perform other tasks or be around people while pumping as many used the words “stuck” or “tied” to their pumps each time they expressed milk. Several talked about having to pump privately. One participant described the discomfort with pumping in front of others by making a comparison to direct breastfeeding:

I just feel like you have to go and be somewhere else when you're pumping because if you're just breastfeeding in public [the baby is] covering your nipple. If you're pumping in public, if you were to do that, your nipples are in the flanges

and they're see through. I think you're more open and vulnerable pumping than you are breastfeeding.

Finding Relief. Participants who directly breastfed found relief from the fatigue in knowing that it would get better, their babies were growing, and trusting infant feeding cues rather than tracking and timing feeds. These observations gave them the confidence to continue. “It gets really easy because they don’t eat as often. I knew it was going to get better, so that’s why I stuck with it.” Another stated that she continued because direct breastfeeding on demand (feeding upon infant hunger cues versus a schedule) during the night was easier than if she “had to wake up in the middle of the night and make a bottle, whether it was breast milk bottle or a formula bottle, I think [it] could create some stress in his and my relationship.” Women who directly breastfed dealt with the challenge of returning to work by either staying at home or introducing combination feeding (expressed breast milk and direct breastfeeding). All three participants who practiced combination feeding returned to work within 12 weeks. Half of the direct breastfeeding participants were employed and returning to work but had seven or more months of maternity leave while the other half were stay-at-home mothers.

In contrast to those direct breastfeeding who felt that their bodies and infants’ hunger cues were in sync, exclusively expressing participants who had felt that their bodies were failing were relieved to see the quantity of milk their babies were receiving and developed routines:

I documented every single ounce she took, and it was good for me to be reassured that I knew that she was getting something, so that offered some relief ... the

reassurance of knowing how much she was getting helped me and my mental health significantly.

Those who practiced exclusive expression described daily schedules. Timetables allowed them to sleep and share feeding responsibilities. One said that since her husband could help with feedings, they could get into “a routine to where I instead of feeding her directly on the breast every two hours or every hour and a half ... I would just have to pump maybe every three hours.” For one participant, once she “started to accept exclusively pumping that was kind of a relief” it offered her “a way to be able to feed him without having the stress that [direct] breastfeeding had caused.” Participants who expressed also stated that better equipment such as wearable pumps, less time-consuming cleaning, and greater acceptability of expression in public would make their method easier.

Not Alone on the Journey

Having a support network was crucial to continuing to provide breast milk. Participants appreciated feeling as if they were not alone in their feeding journeys. Whether feeding directly at the breast, exclusively expressing, or combination feeding, they found support in their partners and co-workers. Participants actively sought support through social networks, especially online communities, for information and support. The amount and type of support provided varied.

Partner Support. Participants who directly breastfed commended their partners for supporting their decisions to feed breast milk and their “continued cheerleading” along the way. Despite not being able to assist in providing breast milk, partners were still able to provide physical support. A participant described how her husband “stepped

up as far as taking care of [other children's] needs" and grabbing pillows for her to make her time spent nursing easier. Partners of participants who exclusively expressed also served as supporters in the decision to express and cheerleaders reminding them that they were "doing a great job". In addition to caring for older children, significant others were praised for their physical assistance with infant feedings. Some participants described that their partners would feed the infant expressed breast milk from a bottle while they simultaneously pumped. Some partners also assisted with cleaning pump parts and handling and storage of breast milk. Women appreciated that their partners were able to share in the feeding responsibilities like one that "did the middle of the night feedings throughout" with those night feedings lasting until the baby was about eight months old.

Social Support. Participants in all groups sought online networks of other breast milk feeding women. Whether to vent or ask a question, the 24/7 presence of online support was important and comforting. "It's just nice to feel like not alone. Especially those late, late, late nights where you're just sitting up and it seems like no one else in the world could possibly be up with you. They describe a form of solidarity." One participant stated that this was "vital to having a healthy nursing relationship."

Some women also attended in-person support groups such as La Leche League meetings and "Mommy and Me" support groups. Coworkers were also important social supports for the combination and exclusive expresser participants employed outside of the home. One exclusive expressing participant would express at the same time as a co-worker noting, "I'm not sure I would have made it as long as I did without her camaraderie." Others reported receiving encouragement from non-infant feeding colleagues. She stated:

co-workers literally be like, 'take your time, do what you want to do.' And I know it wasn't like a fake thing. It was literally them being like, 'we get why you're anxious and we get why you don't want to do it and you feel bad like leaving, but it's something you have to do for yourself and for your kid.' I leaked once at work and they're like 'Yeah, we get it, you've got to go and when you've gotta go.' So, it was pretty nice seeing and them telling you that.

A key difference in support received by these participants was revealed in the descriptions of support for their chosen method of feeding. Only two participants who fed at the breast spoke of lactation consultants who had helped them. Yet, several of the exclusively expressing participants spoke of an inability to latch even with lactation consultations. More importantly, they spoke of not being provided information on exclusive expression. "They never offered a pump or talked to me about pumping." One wanted to know it was an option "or if I would have known where to find more information about it. It was not something that they mentioned in the hospital or anything". Even when latching wasn't working "it was either you breastfeed, or you just give them formula... There were other options outside of, you know, all or nothing".

This polarized approach to infant feeding options made women feel alone and unsupported in their chosen method to exclusively express. The push from family members to switch to formula instead of continuing to exclusively expressed was frustrating. "You want somebody to kind of cheer you on like, oh, you're doing a good job. This is great what you're doing." "I really crave and wanted support and wanted people to just kind of rally around me." Participants instead cited Facebook, YouTube, and Instagram as resources for information and support.

Finding Joy in a Common Goal

Sources of Enjoyment. Largely motivated by the health benefits such as immunological and nutritional components, the primary goal for participants was to provide breast milk. So regardless of the feeding method used, participants found joy in being “the one” that would supply their infants’ nutritional needs. Not only were their infants “thriving and healthy” but “it’s something only I can do that no one else can do it for him except for me ... I’m his sole nutrition provider right now and that feels nice.” One directly breastfeeding participant said excitedly “I grew them from just my body for the first six months! It’s just a really satisfying thing...I mean it kind of makes you feel like a badass.” An exclusive expresser also felt “empowered” because she was “still able to provide such great nourishment for my baby via pumping”. In all feeding groups, words like “happy”, “proud”, “glad,” and “just a really good feeling” were used to describe how “producing something that’s so good” made them feel.

Some participants who fed directly at the breast described it as a “comfort to both” mom and baby and a “relaxing time”. While participants who expressed milk did not report this experience, they did gain additional enjoyment from their abilities to build an oversupply of milk. One donated to a friend and said of the experience:

it makes you feel good. It means having to pump more here and there, but if you feel really good because the roles are reversed, I would hope that one of my friends would be willing to help me as opposed to having to find donor milk from a stranger.

Seeing the stockpile of milk gave one a sense of “satisfaction in filling up bottles and seeing the numbers” and gave some exclusive expressers the ability to reach their breast milk feeding goals of a year while being able to stop expressing sooner.

Bonding. Providing breast milk was a bonding experience for participants and their babies and offered a sense of connection. Direct breastfeeding participants credited the physical “closeness and touch” while feeding for their bond. One combination feeding participant described the bonding time of sharing “little moments” like when she was feeding and would “look down at him and he [would] smile and then go back to eating.” While not as frequently described as bonding and closeness, participants who exclusive expressed also spoke of a connection they felt by being the only one able to provide benefits to their infants. These provisions were enough to “feel like I bonded with her and even when I'm not with her, that I'm doing something for her”. Participants who were expressing talked about the bonding that occurred with others who took part in infant feeding:

it was nice for my husband. I could tell that he was missing part of the bonding. I mean, yeah, they can change diapers and that kind of stuff was different than actually like providing nourishment for your child. So that part of me made me happy seeing how it changed their interaction and my husband more feeling connected to the baby

Mixed Feelings. There were mixed feelings about the process of feeding breast milk that varied by feeding group, but all agreed that the end result of feeding breast milk made it worth the effort. While direct breastfeeding was generally described as enjoyable and satisfying, women also felt that the inability to leave and being touched so often

contributed to what one participant called a “mental toll of breastfeeding” further stating, “to not be able to leave your kid for more than two hours at a time can be exhausting.” Another longed to share the responsibility and it “would be nice if someone else could feed him”.

While breast milk expression gave participants the ability to foster the infants’ relationships with others, they also felt at times as though they were missing out on time with family, friends, or the infant when taking time away to express milk and responsible for feeds. The time-consuming nature of expression made women feel a “love-hate relationship” with infant feeding. They loved being able to provide breast milk, but the process of pumping was not always enjoyable. One said of expressing:

I dreaded it. I hated it . . . the first 30 seconds of it was extremely painful, like painful enough that I had to grind my teeth and just bite down and it was overwhelming . . . but then after 30 seconds, I didn’t feel anything and then I could pump for hours and it was fine.

This same participant, however, also said “Even if I could go back [to direct breastfeeding] . . . I still think I would have pumped because the reassurance of knowing how much she was getting at that time helped me and my mental health significantly.” Another also said that despite the challenges that she thought she would “lean more towards” exclusive expression over directly breastfeeding in the future.

While they considered exclusive expression to be the best option and a way of providing breast milk that worked for them, some mourned the loss of the direct breastfeeding experience and felt guilt about not meeting the expectation to feed at the breast.

it's like mom guilt, this just like always feeling guilty about something, right? So, I knew that with pumping. I was still able to do it, get her what she needed, but I missed out on that bonding and missed out on the convenience. What is it they say, "boob is best"? . . . So, I felt this pressure that this is what is best. And so, when you're not meeting what I think that society or what is said out there in social media, is that was kind of hard . . . I think there was some jealousy and like other moms who just can have their baby come up, they latch on and they start taking milk and it's like they make it look so easy. So, then you wonder, why is this so difficult for me?

Another felt guilty about choosing exclusive expression even though she did not experience latch issues. She found expressing easier so it "felt like a bit of a cop out" for her.

Discussion

This study is unique in that the experiences of participants who exclusively expressed breast milk for healthy term infants were compared to those who fed directly at the breast. Understanding the factors related to breastfeeding exclusivity has been limited by definitions of breastfeeding used in research and data collection. This study expands those definitions by including participants practicing different methods of breast milk feeding and exploring their experiences. Additionally, it is the first to examine these experiences in terms of satisfaction and enjoyment using the lens of the Situation Specific Theory of Breastfeeding.

The first aim of this study was to compare the experiences of participants based on feeding method. A major divergence in their experiences occurred when exclusive

expressing participants stopped directly breastfeeding due to latch difficulties or fatigue. Pain and feeding problems are often cited reasons for discontinuing breastfeeding (Bai et al., 2015; Balogun et al., 2015; Newby & Davies, 2016) and for any milk expression (Jiang et al., 2015; Flaherman et al., 2016; Felice et al., 2016). While Flaherman et al. (2016) found expression to be used as a strategy to improve direct breastfeeding, participants in this study used expression as a strategy to replace direct breastfeeding to achieve the ultimate goal of providing breast milk. Exclusive expression may be a way that women can navigate the demands of early motherhood, their own needs, and still provide for the nutritional needs of their infants through breast milk.

Social support, especially online support was crucial to participants' abilities to continue feeding breast milk. Recent studies have shown the importance of social media and social support in improving breastfeeding outcomes. Researchers have found that participation in social media breastfeeding support groups, had positive effects on exclusive breastfeeding both directly and indirectly through breastfeeding confidence and knowledge (Wilson, 2020). A qualitative study of eight breast milk feeding mothers revealed that women had increased self-efficacy due to knowledge and confidence gained from social media groups along with increased agency due to the 24/7 accessibility of support and information (Black et al., 2020). These studies did not include women who exclusively expressed breast milk. The participants in this study similarly credited social media for their abilities to find information and keep going; thus, supporting social media as a valuable resource for breast milk feeding women regardless of feeding method.

Participants who were expressing felt that they were giving their infants the best nutrition but had conflicted emotions surrounding their choices. An emphasis on the

“breast is best” mentality and promotion of breastfeeding (usually at the breast) as the superior feeding choice has been found to lead to guilt in women who formula feed or are unable to meet their breastfeeding goals (Benoit et al., 2016; Fallon et al., 2017; Hvatum & Glavin, 2017; Komninou et al., 2017; Stallaert, 2020). Additionally, Jardine (2019) found that negative feelings such as guilt were more likely to be experienced by women unfamiliar with the practice of exclusive expression prior to delivery. Others have reported feelings of judgement or stigma from society and healthcare providers regarding breast milk expression (Dietrich Leurer et al., 2020; Johnson et al., 2013). This study adds to this existing knowledge that women who are unable to meet their infant feeding intentions feel guilt, however, more studies are needed to determine whether these feelings persist in women who intend to practice exclusive expression in a society in which it is not yet a widely accepted practice.

Participants in this study were satisfied with and enjoyed their breastfeeding journeys, despite early challenges and many not feeding in the way that many had intended. They mentioned several key criteria of salutary breastfeeding as defined by the Situation Specific Theory of Breastfeeding (Nelson, 2006) such as satisfaction, enjoyment, and empowerment. These feelings were heavily tied to their bodies’ ability to produce breast milk and support their children’s growth. Exclusive expressers also used expression to strike a balance between their own physical and mental needs with their infant’s nutritional needs, representing consideration of the risk benefit ratio also necessary for salutary breastfeeding. More studies are needed to compare experiences of women who intended to feed by exclusive expression.

Limitations

There was little diversity within the sample of participants which limits transferability of these findings, particularly, to women of color. This could be due in part given low rates of breast milk expression, especially among African American women. In one sample of inner-city African American women, only 13.2% expressed breast milk (Bream et al., 2017). Limited diversity within the Facebook groups utilized to recruit participants could also have impacted sample diversity. More research with intentionality to recruit women of color is needed to determine whether their experiences are similar. Furthermore, only 6 out of 15 participants were exclusively expressing, and 5 of this 6 did not intend to exclusively express. Larger samples of women with intentions to exclusively express are needed to understand and compare experiences. All participants in this study self-identified as women and mothers, but future research should incorporate inclusive, non-gendered language to support all families that feed breast milk that may not identify as such.

Conclusion

As the landscape of breast milk feeding changes, providers must be prepared to support women in whichever method they choose to provide breast milk. Furthermore, the importance of maternal satisfaction has often been neglected in breastfeeding research focused basing breastfeeding success on duration and exclusivity outcomes. It is imperative for clinicians to support a positive, satisfying, and enjoyable experience of breast milk feeding regardless of method used. Acknowledging exclusive expression as a viable option for breast milk feeding may improve clinicians' support.

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Table 1

Probing Questions Guided by Situation-Specific Theory of Breastfeeding (SSTB)

Probing Question	Construct	Rationale
“How did that make you feel about how you feed your baby?”	Salutary Breastfeeding	Satisfaction, enjoyment, and feelings of empowerment are criteria for salutary breastfeeding
“What helped you continue feeding breast milk when things were difficult?”	Salutary Breastfeeding	Manageability is a criterion for salutary breastfeeding
	Support Networks	A proposition of the SSTB is that the amount and quality of support may influence progress toward salutary breastfeeding
“What would you do differently if you could do it all again?”	Salutary Breastfeeding	Encourage participant reflection on decision-making processes to identify experiences that are contrary to salutary breastfeeding criteria
	Maternal readiness and capacity	Knowledge, past experiences, and expectations are elements of maternal readiness and capacity which impacts interactions with the infant, support networks, and breastfeeding

Table 2.

Participant Demographics

	Direct Breastfeeding n=6 (%)	Combination n=3 (%)	Exclusive Expression n=6 (%)
Race			
Black/African American	0	0	1 (17)
Hispanic	0	0	2 (33)
White, Non-Hispanic	5 (83)	2 (67)	3 (50)
Mixed- Race	1 (17)	1 (33)	0
Marital Status			
Married	6 (100)	3 (100)	6 (100)
Level of Education			
Some high school	0	0	0
High school diploma	0	0	0
GED	0	0	0
Some College	1 (17)	0	1 (17)
College Degree	3 (50)	3 (100)	1 (17)
Graduate school or higher	2 (33)	0	4 (66)
Income^a			
Under \$20,000	0	0	0
\$20,001-40,000	0	0	0
\$40,001-60,000	1 (17)	0	0
\$60,001-80,000	1 (17)	0	1 (17)
\$80,000 and above	3 (50)	3 (100)	5 (83)
Parity			
Primiparous	1 (17)	1 (33)	3 (50)
Multiparous	5 (83)	2 (66)	3 (50)
Feeding Intention^b			
DBF only	3 (50)	0	3 (50)
Mostly DBF and some EBM	3 (50)	3 (100)	1 (17)
Mostly EBM, some DBF	0	0	1 (17)
EBM only	0	0	1 (17)

^a One participant in direct breastfeeding group declined to answer^b DBF=direct breastfeeding, EBM=expressed breast milk

Table 3

Comparison of Direct Breast Feeders and Exclusive Expressers

Theme: Facing Challenges		
Subtheme	Direct Breast Feeders	Exclusive Expressers
Sources of Fatigue	Frequent feedings Exhaustion Biting	Frequent feedings Pressure to feed at breast
Finding Relief	Return to work Feeding on demand Infant weight gain	Building routines Seeing Quantity Acceptance
Body Failure		Latch difficulty/pain Supply concerns
Pumping in Isolation		Pressure to feed at breast Tied to pump
Theme: Not Alone on the Journey		
Subtheme	Direct Breast Feeders	Exclusive Expressers
Partner Support	Encouragement Physical Support	Shared Responsibilities Physical Support Encouragement
Social Support	Online support groups Workplace support	Online support groups Lack of support from healthcare providers and family
Theme: Finding Joy, Common Goals		
Subtheme	Direct Breast feeders	Exclusive Expressers
Sources of enjoyment	Health benefits Sole nutrition source	Health benefits Sole nutrition source Breast milk donation
Mixed Feelings	Inability to share responsibilities	Love-hate relationship Guilt
Bonding	Closeness Providing comfort	Family members bond Providing nourishment

Unseen, Unheard: Qualitative Analysis of Women Experiences of Exclusively Expressing Breast Milk

Abstract

Background: Breast milk feeding has numerous benefits for women and infants. Positive maternal experiences with breast milk feeding impacts exclusivity, duration, and maternal mental health. Most research focuses on women feeding directly at the breast. Some women elect to feed exclusively expressed milk to their healthy, term infants rather than feed directly at the breast. Little is known about what constitutes a positive experience among this population. **Aim:** The aim of this study was to explore women's experiences of exclusive expression. **Methods:** Interviews were conducted to collect qualitative data from a purposive sample of 21 women practicing EE via phone or videoconference. Interviews were analyzed for themes. **Results:** Three themes: *Unseen and Unheard, Doing it My Way, and Getting into the Groove*, and 8 subthemes: *Breast is Best, Missed Opportunities for Healthcare Provider Support, Fighting for it, What Works for Us, A Sense of Control, Preparation, Tricks of the Trade, and Making it Manageable* were identified. Despite challenges including a lack of support from healthcare providers, and a lack of acknowledgement as breastfeeding mothers, exclusive expression offered participants a method to continue breast milk feeding in a way that they found to be satisfying. **Conclusion:** This study provides insight into experiences of exclusive expression. Societal pressure to feed from the breast may have negative emotional consequences for women electing to exclusive expression. There is a need for more

information and support for breast milk expression from healthcare providers along with a reframing of how breast milk feeding is discussed and promoted.

Keywords: human milk, breast feeding, breast milk expression, lactation, bottle feeding, qualitative research

Unseen, Unheard: Qualitative Analysis of Women Experiences of Exclusively Expressing Breast Milk

Statement of Significance

Problem	Little is known about the experiences of women who exclusively express breast milk for healthy, term infants. An understanding is necessary to support a positive maternal feeding experience.
What is Already Known	An increasing number of women elect to feed exclusively expressed breast milk. This practice has been associated with early weaning.
What This Paper Adds	This study provides evidence that women who exclusively express have positive experiences such as bonding, shared responsibility, and manageability. However, these positive experiences occurred in spite of missed opportunities for healthcare provider support for exclusive expression and societal views that fail to acknowledge women who exclusively express as breastfeeding mothers.

Introduction

It has been well-established that infants who receive breast milk and women who produce milk have improved health outcomes compared to infant formula (AAP, 2012; Bibbins-Domingo et al., 2016; Binns et al., 2016). Because many of the benefits of breast milk are dose-dependent, major health organizations recommend exclusive breast milk feeding (feeding only breast milk with no formula, water, or complementary foods) for the first six months of life (AAP, 2012; American College of Obstetricians and Gynecologists,

2018; Association of Women's Health, Obstetric, and Neonatal Nurses, 2015). In the US, only a quarter of infants exclusively receive breast milk for six months, falling well short of the World Health Organization (WHO) targets of 50% by 2025 (WHO, 2014).

Nationally, exclusivity rates descend from 47% of infants receiving exclusive breast milk feeding (BMF) at 3-months to 26% at 6-months (CDC, 2020).

Positive maternal experiences and emotions have been shown to be associated with higher rates of exclusive BMF and longer duration. For instance, higher scores on the Maternal Breastfeeding Evaluation Scale (MBFES), a tool that includes aspects of satisfaction and enjoyment, was associated with greater likelihood of exclusive breastfeeding at five months (Hongo et al., 2017). Additionally, positive emotions during breastfeeding and positive maternal attitudes toward breastfeeding have both been associated with exclusive BMF outcomes (de Jager et al., 2013; Wouk et al., 2019; Wouk et al., 2020).

The research on these emotional and experiential factors have been focused direct breastfeeding (DBF), defined as feeding an infant latched at breast. For instance, the MBFES was designed based on experiences of successful BMF from the breast and contains language specific to DBF (Leff et al., 1994). Therefore, it is difficult to generalize the findings to those practicing other methods of breast milk feeding as this can also occur through expression of breast milk that is bottle-fed to the infant. The practice of breast milk expression is common, and globally, there is an increasing number of women who practice exclusive expression (EE), in which infants are fed exclusively fed breast milk that is expressed without latching to the breast (Jiang et al., 2015; Pang et al., 2017). Data on the practice of EE and associated factors in the U.S. is limited as

national surveillance questionnaires and much of the BMF research lack specificity on feeding methods and proportion of feeds at breast vs. expressed breast milk. This limits conclusions that can be drawn regarding factors impacting BMF in this growing population of women who practice exclusive expression.

There are few studies examining the experience of EE. In a previous study conducted by Anders et al. (2021), the experiences of participants who exclusively expressed were compared to those who fed directly at the breast. All participants found satisfaction in providing breast milk to their infants. Participants who ultimately practiced EE despite intentions to DBF were left with subsequent feelings of frustration and guilt that their experience did not match their intent. While EE allowed them to provide breast milk while negotiating early postpartum fatigue and latch problems, they experienced a lack of support from healthcare providers and negative feelings towards their bodies that they viewed as failing. Because many participants practicing EE in this study had prenatal intentions to DBF, these findings are not generalizable to persons with intentions to practice EE. There is a scarcity of literature related to satisfaction for persons intending to practice EE from birth.

There is a gap in knowledge related to what constitutes a satisfying BMF experience from the perspectives of women who EE. Additionally, there is not currently a theory-derived definition of a holistically satisfying and positive experience of BMF that has been confirmed through research. The Situation Specific Theory of Breastfeeding (SSTB) was developed by Nelson (2006) to provide such a view. The core construct of salutary breastfeeding is defined as “breastfeeding that promotes the emotional, mental, and physical health of the mother, infant, and family” (Nelson, 2006, p. 19), but there is a

lack of research confirming the validity of the construct. Since its development, the theory has not validated via empirical methods. The criteria for salutary breastfeeding are similar to descriptions of satisfaction used in the Maternal Breastfeeding Evaluation Scale but also incorporate the additional elements of informed decision-making and contextual aspects such as familial and social relationships that offer a more holistic view of the experience.

The main proposition of the SSTB states that the amount of conflict or congruence with between maternal and infant readiness with various support networks (including healthcare providers) during the infant feeding decision-making period influences movement toward either a negative or salutary breastfeeding experience. If healthcare providers are to support a salutary BMF experience for women who practice EE, there is a need to understand the experience from the maternal perspective. Therefore, the aims of this study were to explore the experiences of persons who practice EE with the specific research questions: a) What is the feeding experience for women who EE? b) How do women describe their infant feeding goals and intentions? c) What factors influence women's experiences of infant feeding? and d) Do the narratives of women who EE contain empirical evidence to support the construct of salutary breastfeeding?

Feminist Theory

This research was conducted from a feminist philosophical perspective. Some researchers who use feminist theory have noted that breastfeeding can be viewed as empowering, a way of embracing the nature of the female body (Drouin, 2013; McCarter-Spaulding, 2008). However, breastfeeding promotion research has focused on

what is best for the infant (Volk & Franklin, 2020), ignoring the experiences for those providing the milk. This medicalization and moralization of breastfeeding promotion centered on the needs of the infant has brought critique from feminist scholars and liberal feminists. Placing the infants' needs at the center of breastfeeding reduces women's sovereignty over their own bodies, may ignore the importance of their own personal fulfillment, and does not acknowledge the social constraints impacting feeding choices (Drouin, 2013; Volk & Franklin, 2020). Additionally, societal norms of breastfeeding as feeding directly at breast have placed limitations on how women define their infant feeding experiences (Anders et al., 2020).

The unique voices of women who choose to practice EE is not widely represented in current societal, medical, or research definitions of breastfeeding. As such, care must be taken when constructing knowledge of EE to not further reduce the value of the individuality of women's experiences by imposing societal breastfeeding goals and interpretations. Therefore, research from a feminist philosophical perspective is necessary to ensure that the voices of women whose infant feeding method has been traditionally underrepresented in the breastfeeding literature are heard.

Methods

Ethical Considerations

Ethical approval for this study was obtained from the Primary Investigator's (PI) university Institutional Review Board. Participants were provided and read an information sheet and verbal consent was obtained prior to beginning the interviews.

Study Design

This study employed a qualitative design with narrative analysis. Narrative methods are well-suited for research from a feminist epistemological standpoint because detailed stories of participants' experiences can be used to gain insight into phenomena that have been suppressed in scientific research (Chase, 2018), as is the case for those exclusively feeding breast milk via exclusive expression to term infants. After participants shared their stories, probing questions (Table 1) were used as needed to obtain deeper understanding (Kim, 2016).

Participants

The target population for this study was women who had given birth and practiced exclusive expression within the past year. To obtain varied perspectives from a diverse sample, participants were purposively sampled from Facebook groups for persons who express breast milk. Between September-November 2020, a flyer containing a link to an eligibility screening survey was posted to selected groups. Those expressing interest were eligible to participate if they were age 18 or older, could speak and read English, had given birth to a term (greater than or equal to 37 weeks gestation), singleton infant within the past year, and had exclusively fed their own breast milk for at least 2 weeks using exclusive expression. Two groups, those who intended to EE and those who intended to directly breastfeed but ultimately arrived at EE, were invited to participate in this study. Exclusion criteria included parents of multiples and parents or infants with complications including prematurity or requiring Neonatal Intensive Care Unit admission.

Data Collection

The PI conducted interviews via Microsoft Teams between September and November of 2020. Participants were read a consent form and gave verbal consent to be interviewed and audio-recorded. Demographic data was collected using a survey that was read to participants while the PI recorded verbal responses. Participants were then asked to share their story of infant feeding experiences . After the storytelling phase of the interview, the conversational phase included asking probing questions as needed to obtain more information related to criteria for salutary breastfeeding from the Situation Specific Theory of Breastfeeding. Examples of probing questions are listed in Table 1.

Data Analysis

The transcribed interviews were read in their entirety by the PI and another member of the research team to gain familiarity with the text and to confirm accuracy of the data. Thematic analysis of the narratives (Creswell & Poth, 2018; Ravitch & Carl, 2016) began with development of an initial coding schema by each investigator independently. Code generation and refinement continued throughout the analysis with data management using NVivo software. Codes were then organized and classified into themes. The two investigators discussed codes and themes to reach a consensus. Comparisons were between groups and within groups (Ayres et al., 2003) to identify commonalities and differences in infant feeding experiences and behaviors based on feeding intention. Member checking with a portion of the participants provided confirmation of the investigators' interpretations. Demographic data were analyzed using descriptive statistics.

Results

Sample Characteristics

Demographic characteristics of the sample (N=21) are presented in Table 2. About half (n=10) had intended to practice EE while the rest (n=11) intended to either direct breast feed (DBF) or use a combination of feeding methods. Of the multiparous participants (n=6), four had practiced EE previously and had intentions to repeat with the current newborn, two had practiced EE previously or a combination and had not intended to EE breast milk this time. The average duration of exclusive breast milk feeding was 5.04 months (SD=1.20) with 5 participants still exclusively feeding breast milk at the time of the interview. All participants were still feeding at least some breast milk at the time of the interview. The average infant age at the time of the interviews ranged from 2.75 months to 10.75 months (M=6.41, SD=2.51).

Themes

Three themes *Unseen and Unheard, Doing it My Way, and Getting into the Groove*, along with 8 subthemes: *Breast is Best, Missed Opportunities for Healthcare Provider Support, Fighting for it, What Works for Us, A Sense of Control, Preparation, Tricks of the Trade, and Making it Manageable* were identified. The first theme reflects participants' experiences of the events and encounters that made participants feel that their concerns and support needs were not listened to and that they were not seen as breastfeeding mothers. The remaining two detail how they were able to continue practicing EE and how this method of feeding met their needs.

Unseen and Unheard

Breast is Best. Participants felt pressure from a variety of sources to not only feed breast milk, but to feed from the breast directly. Their goal of providing breast milk was not heard by others and often times the participants didn't feel as though they were seen as "breastfeeding mothers." This messaging started prenatally for participants that intended to EE. Even though it was one participant's "plan to start pumping. I went to a breastfeeding class and felt that it was like my only choice to try to breastfeed after that" while she eventually stuck to her plan, the lack of acknowledgement of her plan as an option led to "guilt of not being able to directly breastfeed". Several participants echoed the feeling that EE was not presented as an option. For others this continued in the hospital as

"the lactation consultants at the hospital where it was like breastfeeding or nothing. Not nothing, Of course you feed the baby, but there was this like sense of you can just keep nursing. Just keep nursing, just keep nursing. and it was like it didn't matter."

Another who planned to EE agreed that her "opinion [to exclusively express] didn't matter in the beginning" when hospital staff advised to her latch the infant directly to the breast.

When it was not their intention to EE, this pressure to get baby to the breast was "really hard, I feel like society kind of today expects us to breastfeed, and when we can't we feel like failures" when direct breastfeeding was not working. One participant described a friend's suicidal thoughts, which she believed stemmed from her unsuccessful breastfeeding experience due to the statement "breast is best". She felt

unheard when she was “telling her [obstetrician] it [direct breastfeeding] is not working”. She described her experience as “frustrating” when her provider “continued to push breastfeeding”.

Several participants described provider interactions that left participants feeling like they were not seen fully as breastfeeding mothers. When asked by the pediatrician “do you breastfeed or do you formula feed? I have to, you know, there ain’t no options for pump and I give him breast milk through the bottle, and they always look at you so crazy”. Another felt like the healthcare providers did not “know her [infant] as well just because that little checkbox [exclusive expression] isn’t on there.” One described these situations as making her feel like she was being “downgraded” while another compared the feeling to baseball players “who are taking steroids, they have an asterisk on them.” Feeding their infants in public brought scrutiny when they were seen feeding with a bottle. “People are like, ‘Oh, you should be breastfeeding.’ They don’t realize that I am.”

This judgement sometimes came with information that these participants found to be false such as “not giving them all the antibodies which of course isn’t true, and like you’re not gonna have like the bonding with the baby, and I just haven’t found really any of that to be true.” Even family and friends told participants that they were not really breastfeeding and asked repeatedly if they would try latched even when they intended to and carried out EE from the start.

Missed Opportunities for Healthcare Provider Support. Healthcare providers’ focus on the “breast is best” led to what participants perceived as a lack of support for their chosen methods or implications that it was outside of the norm. Subsequently, healthcare providers missed valuable opportunities to provide education on breast milk

expression. One participant noted that if she hadn't "researched it on my own, I probably would be exclusively formula feeding. I think there's a big opportunity for moms to note there is a viable third option." Others reported that they were not provided education or demonstration of pump usage because they were told not to express during breastfeeding classes. When education regarding pumping was provided, it left participants feeling discouraged. For example, an obstetrician told one participant that the "milk wouldn't be tailored to the baby since the saliva isn't getting on the nipple." Some participants, however, spoke of experiences that made them feel supported, being "cheered on" and reassured by nurses when carrying out her intentions of EE from the start. Others received valuable information about pump operation or how to ensure that pump parts were fitted properly to the breast in cases when different sizes were necessary.

Both participants who intended to EE and those that did not felt that at times, providers did not support participants' overarching goal of exclusively providing breast milk. When participants did not want to or had difficulty feeding directly at the breast, providers instead offered formula as the alternative. For instance, when one participant had difficulty latching,

They were kind of just like baby needs to eat. Like if you're not gonna feed her we need to give her a bottle [formula], and I was like you're not giving her a bottle [of formula]. I didn't ask for a bottle. I asked for help to see if I'm doing this right, and before we left the hospital, I ended up or they let me, they brought me a pump and I ended up pumping and feeding her from the bottle.

Another participant who did not feel supported in her decision to express when she was sent home with formula "just in case" EE didn't work out.

Similarly, hospital staff offered formula when supplementation was needed instead of breast pumps or donor milk. One participant described her baby as “too sleepy to latch” while in the hospital. When she asked for donor breast milk, she reports being met with eye rolling from staff. The participant instead hand expressed until later requesting a breast pump from a different staff member. Some infants were jaundiced after birth and needed increased intake. For one participant who started with direct breastfeeding, a lactation consultant “scared the bejesus out of me [participant]” when she urgently told her “He is sleepy. He is jaundiced! He is not getting all the nutrients he needs. You need to give him formula right now” without mention of the option of giving expressed milk. She felt as though using formula was the only option until she went home and started expressing.

Doing it My Way

Fighting for It. Participants described EE as a challenging way to provide breast milk. From the start, those who had planned to EE fought through tensions with others over their decision. In response to the push to DBF or use formula, one stated that “Luckily I was strong enough in my own personal will” while another described having to “really push back on them”. A participant who struggled against her husband’s desire to give infant formula waited for him to leave the house so she could throw away the formula. While it was worth it to be able to feed breast milk rather than formula, they had to “put the effort into it. It’s kind of like exercise, if you put the time and dedication into it, you know not everyone has time for it. You have to want it, you know, and I obviously wanted it.” By putting in this effort in the beginning, they were able to continue.

After the initial fight to start, participants also found it difficult to continue EE. They described the time-consuming nature of pumping and cleaning pump parts. They also noted additional expenses related to pumping such as accessories to make the process hands-free, storage items such as breast milk storage bags and additional freezers, and replacement or extra pump parts. As milk needed to be expressed several times each day to avoid complications like clogged ducts, mastitis, or decreased supply, participants felt reliant on the pump.

Bringing in an adequate milk supply also meant “kicking it into high gear” by expressing every two to three hours which felt like a lot of work. This time commitment is similar to DBF but with additional time for set-up and cleaning of pump supplies. Despite the time needed, participants described gratification in their accomplishments. “It just gave me a sense of pride that I didn’t give up . . . you know, in spite of the challenges, I was still able to do this for her and it felt like a necessary sacrifice.” The accomplishment of being able to provide breast milk made them feel that fighting through the challenges was worth it.

What Works for Us. Participants shared a variety of pragmatic experiences that led to or reinforced their EE experience. For those that did not intend to practice EE, expressing worked better than latching directly at the breast. While some had pain or nipple damage from latch attempts, others found they did not enjoy feeding directly at the breast as they had expected. Participants made statements such as “it [DBF] just wasn’t this amazing experience”, “I didn’t enjoy it”, and thought “maybe this isn’t for me”. One participant who used EE with her last child felt more comfortable and choosing EE again. She described herself as lacking confidence when attempting to latch as she had only ever

expressed previously. Another “fell into pumping” as she just started expressing more and more and found she did not miss direct breastfeeding. For others who intended to EE, it was a way that worked to avoid the difficulties they anticipated with direct breastfeeding such as latch problems due to flat nipples. They used the word “stressful” to describe thoughts of trying to latch and decided to bypass it by using EE. Even though EE was not the mainstream method for providing breast milk, it’s a way that worked for these participants’ lifestyles and bodies.

Participants described that EE gave them enhanced freedom to share feeding responsibilities. In their lives, it worked to have others help with feedings making it feel like a “team sport.” EE provided them with an opportunity for others to feed and bond with the infant. “It’s important to my family to keep us as bonded as we want to be. It allows my [older] daughter for the most part to get interaction with her [the infant].” While initially some worried that EE would not work for them because they thought they would miss out on bonding themselves, found that the route didn’t matter and bonding still worked for them as one participant stated:

Whether you're nursing or whether you're pumping, there will be moments where you feel like a cafeteria, you know, and then your sense of self is consumed by your sense of motherhood. It doesn't matter how you're doing it, how you're feeding your baby, you're still going to feel like you don't know who you are anymore. Like that there's this loss of individual identity because now my identity is inevitably, inextricably, permanently tied with hers . . . but you're trading it for this sort of profound connection that you have with your baby.

In addition to the positive feelings that many expressed about facilitating these bonds, some also knew they “would be going back to work” and would “have to pump there anyway.” Exclusively expressing eased the transition as one participant did not “have to get her [infant] off the breast” after a three week maternity leave and another wanted to “rotate through who was doing the middle of the night feedings” to minimize fatigue upon returning to work.

A Sense of Control. Providing breast milk in this way gave them a sense of control and ownership over the process and in some cases their bodies. Participants spoke of tracking their output of milk along with their infant’s intake which gave them reassurance in knowing that their infants were receiving enough. “I have that reassurance of doing the math at the end of the day and knowing how much he’s getting.” One participant expressed that she had anxiety surrounding her infants’ intake and another also said it benefitted her psychologically to have knowledge of how much her infant was eating. This control carried over into their schedules as well with some describing structured routines that gave them control over when milk was expressed rather than feeding when the infant is hungry as in direct breastfeeding. Keeping track of and controlling their supply of milk allowed participants to plan when they could stop expressing but continue to provide stored milk.

EE also gave some participants a sense of bodily control and autonomy. When meeting resistance with her chosen infant feeding method, one stated “it’s my body and I’ll choose what I want to do with it” while another was uncomfortable with the thought of a direct latch and others touching her breasts to assist with latching stating “at some point this is my body too.” Another echoed the discomfort with the repurposing of her

breasts after already experiencing the transition of pregnancy: “my body is mine and you know, your breasts are, for me, were used like in sexual ways and then having a baby and it’s going from you know like a body change.” For others, the need for this control over their breasts was limited to feeding in public as EE provided freedom from having to “always have to be like here out in public and whip out my boob”.

Getting into The Groove

Preparation. Participants described various ways that they became physically and mentally prepared for feeding breast milk. With an intention to EE, some began research and preparations during pregnancy. Yet, with extremely limited access to resources and information, one felt that “we were figuring it out by ourselves along the way”. Those who attended breastfeeding classes received little information about milk expression. Therefore, social media proved to be a valuable information source. One said that knowledge gained made her “feel more empowered” and another stated knowing that “exclusively pumping existed was already a bonus point for me ‘cause I’ve read stories of some women who didn’t know that exclusively pumping was a thing at all.” For those who had practiced EE with a previous child, their prior positive experience made them feel prepared and confident.

For others who did not know of EE as an option and had not envisioned needing to express, research occurred after the infant was born. For one participant this meant having to supplement with formula, until she found the necessary information to begin EE. She described that this was difficult because resources she trusted, such as pediatrician and CDC websites, lacked information on EE. Doing this preparation and

research after the infant was born left participants to “figure it out by ourselves along the way.”

Learning the Tricks of the Trade. Along the way, participants described learning about equipment and tips through a combination of advice from social media groups and their own trial and error experiences. Choosing pumps was an important decision during the journey. Common factors in determining which pump suited each individual were portability and suction. Pumps with adequate suction were necessary to avoid complications like plugged ducts, mastitis, or low milk supply. One participant noted that some pumps are made for only occasional use, not the frequent use that EE requires and were therefore not appropriate. Newer, wearable pumps that allowed users to EE “hands-free” offered time-savings and the freedom to perform other tasks which was important for participants with other children to care for or worked in settings that made milk expression during work hours challenging. Participants watched YouTube videos, read Instagram reviews, and asked questions in Facebook groups to gather EE tips and learn about equipment. They also learned about recommended pumping frequency and techniques like power pumping to establish supply from online support communities. One participant stated that “every person’s journey is different . . . and just kind of listening to my body” was an important part of the learning process.

Making it Manageable. Exclusive expression was viewed as time-consuming and hard work, especially in the early weeks when expressing 8 to 12 times per day to establish a good milk supply. At times it felt all-consuming but once it became part of the routine of daily life “it didn’t feel like it was such a daunting, demanding thing”

anymore. This was initially made more challenging for those without previous experience:

At the beginning I had to get in the groove of it because it was something I had not done ever and you kind of have to build a routine with it because it was very, very stressful at the beginning to know that you're going to commit so much time a day to pump every two to three hours.

Because the beginning of the EE journey was challenging, many used small, step-wise rather than long-term goals for breast milk feeding duration. Once reaching a goal such as three-months, they would assess the manageability to decide on the next goal. The initial burdensome feeling of “being tied to a machine” later turned into a time to “kind of decompress” when participants started to distract themselves doing activities on their phones or watching streaming videos. For all participants continuing to EE seemed more manageable after “dropping pumps,” meaning that once the milk supply was established, participants would decrease the number of milk expression sessions per day, oftentimes dropping the “middle of the night pump” to get more sleep at night. The majority of the participants described having an oversupply of milk that allowed for “dropping pumps” without having to sacrifice exclusive breast milk feeding. Participants with an oversupply often described storing milk that allowed them to wean from EE but continue to feed breast milk and in some cases donate excess breast milk. The prospect of discontinuing EE with a supply of milk stored to feed also made the task of expression seem workable.

Even if I choose to stop pumping literally today that I still have four months' worth of milk in my freezer so that's beyond a blessing to me... It just made me want to do it more because I knew I could supply everything that she needed.

The ability to donate some of the surplus of breast milk was a rewarding experience. For example:

It really gives you great joy to like, be able to give someone something that they are not able to either produce or like I said for adoption and you know, and I gave it away without you know much, maybe some milk bags in return, but it is very, very rewarding.

The COVID-19 Pandemic influenced the manageability of BMF. While in the beginning the pandemic was seen as an obstacle to obtaining support for latching, it later assisted in maintaining a manageable breast milk expression routine. Some participants were able to work from home once they returned to paid employment, a situation that they thought made expressing easier to accomplish.

Working from home I can work on the couch. I could work at my desk and work from the bed, and I do have like a pumping set-up, but it just gives me a lot more flexibility of course. If I was in my office, even though it's just 20 minutes a day, that's 20 minutes with the door locked. But it's also I have to get, you know, get it cleaned in the kitchen is not on my floor and all of that is just there would be so much more it would be so much more difficult if I had to be in the office for two of those pumps a day.

Another participant worked previously with children in various schools and homes and commented that if not for working remotely that she “probably have to get an electric pump and pump in my car or find another way to pump or not even be able to pump at all”.

Additionally, participants felt that they were able to maintain their milk expression daily routines without much difference on weekends due to stay at home orders. As one said, “pretty much the only places that I do go to are my doctor, her doctor, or my parents’ house, so there hasn't really been a time where I don't need, or I don't have access to my pump”. This enabled her to have a “concrete schedule with everything that’s going on.” Another also saw this as a benefit stating “before we were always on the go, and I don't know how I would be able to pump doing that. So, I'm actually really happy that we're kind of in this quarantine.”

Discussion

This study provides a unique contribution to the literature on breast milk feeding by detailing the maternal experience of EE term infants. An overarching theme was that participants felt unseen and unheard stemming from pressure to feed at the breast and subsequently received little support for their method from healthcare providers. Promoting only exclusive direct breastfeeding as the superior method of infant feeding and focusing on the health benefits ignores the realities that women face (Brown, 2016) and creates a dichotomy leaving women feeling guilty when that specific, narrow breastfeeding goal is not met (Benoit et al., 2016; Fallon et al., 2017; Hvatum & Glavin, 2017; Komninou et al., 2017; Stallaert, 2020). Even those who did meet their breast milk feeding goals via EE voiced feelings of guilt and did attempt latching due to this pressure.

Dietrich Leurer et al. (2020) found that participants who had ever expressed at all reported feeling negatively judged by healthcare providers for feeding expressed milk. It has been suggested that “creating an equal platform for all feeding options” (p.203) may reduce these types of negative feelings (Brown, 2018). The ways that society and

healthcare providers define and talk about breastfeeding may impact the experience of infant feeding especially for those who choose feed outside of societal norms. More studies are needed to examine provider knowledge, perceptions, and practices of EE to address this issue.

Pressure to feed at breast is also an example of the moralization of infant feeding that has been critiqued by feminist scholars (Drouin, 2013). Participants, in this study, were able to strike a balance between being empowered by their ability to produce milk and the constraints of the role of feeding the infant. Although at times they felt “tied to the pump” similar to DBF women, participants who EE also felt freedom to leave or return to work knowing their baby could easily be fed their breast milk by others. This made them feel that the transition to work was easier. McCarter-Spaulding (2008) notes that direct breastfeeding from a liberal feminist stance is a “gender difference that stands in the way of liberating women” (p.207). Furthermore, in the U.S. there is no paid maternity leave requirement which places social constraints on women who want to provide breast milk. EE is a method that feminist scholars and healthcare providers need to acknowledge in the face of these social constraints. The shared responsibility of infant feeding experienced by women who EE could be seen from this stance as a more equitable form of providing breast milk and allow for greater autonomy to be separated from their infants.

Online platforms such as Facebook, Instagram, and YouTube were important in meeting participants’ information and support needs regarding milk expression. This is not unexpected given that the sample was recruited through the use of such online support communities. However, in participants’ own research, they found little

information on EE from pediatricians or reputable sources such as library resources or healthcare organization websites. This is similar to findings by Strauch et al. (2019) that information sources included online parenting forums and one-way information websites and blogs but did not find any scholarly articles examining support for EE. Similarly, Dietrich Leurer et al. (2020) also found that for women needing to express milk at all, milk expression information needs were often not addressed by healthcare providers. With respect to EE, there are few information sources or classes available leaving many to do their own research from websites and online forums (Jardine, 2019). An online presence may be a method for healthcare professional to provide more support and information women who EE, but studies are needed on the exploration of social media as a tool for providing that support.

When discussing their goals and intentions, the overarching goal of participants in this study was to feed breast milk to their infants. To them, the route of delivery was less important than what was being fed. They also described step-wise and lengthening goals as their journeys proceeded based on manageability at each step. This reinforces findings that women find the prospect of exclusive breast milk feeding for six months daunting and have desires to view each breast milk feed as important (Brown, 2016). All participants were still feeding breast milk to their infants ranging from 2.5 months of age to almost 11 months of age, many with plans to continue to 1 year or beyond. Existing literature identifies exclusive expression as a risk factor for early weaning (Bai et al., 2017; Jiang et al., 2015). Yet these studies did not measure intentions or levels of support for EE. EE did not lead to early weaning for these participants. However, this was not a quantitative study with a sample size to provide adequate power for comparison. More

studies are needed to identify social and contextual factors involved in early weaning in this population to examine whether the relationships between EE and breast milk feeding duration persist when adequate EE education, anticipatory guidance, and support are present.

Participants' stories provided insight into the construct of salutary breastfeeding and the validity of the Situation Specific Theory of Breastfeeding (Nelson, 2006) for EE. Participants encountered sources of conflict, especially within professional and institutional support systems leading to some negative experiences. Specifically, institutional prioritization of direct breastfeeding resulting in lack of staff knowledge of EE and pressure to DBF conflicted with maternal goals and limited their abilities to find resources on EE. Providers and families were not always supportive of EE resulting in perceived judgement, guilt, and frustration. When participants intended to DBF, infant latch abilities were not always congruent with maternal physical abilities to feed resulting in pain.

When participants encountered congruence in their social support systems, such as social media support groups and families helping with infant feeding, more salutary experiences ensued. Positive experiences consistent with the criteria for Salutary Breastfeeding were feelings of empowerment, autonomy over their bodies and decision-making, bonding with their infants, bonding between the infants and others, shared responsibility, and manageability of EE. For these participants, a salutary experience outweighed the negative feelings leading to an overall positive view of their experiences. This study provides evidence of validity of this theory and its constructs for use in

women who EE. However, more studies are needed to further investigate these relationships and the potential impacts on duration and exclusivity of breast milk feeding.

Strengths and Limitations

This study is unique in its focus on the experience of only those who practiced EE for term infants. Therefore, a strength of this study is the inclusion of voices that have not previously been included in the literature on infant feeding. All 21 participants practiced EE for term infants while most literature on exclusive expression is either limited to special population such as premature or NICU populations or include those who express at all rather than practicing EE. Additionally, 62% of this sample were non-white making for an ethnically diverse sample.

Despite these strengths, there were limitations. First, this is a small sample and results cannot be generalized to the experiences of all people that practice EE. More studies are needed with larger samples including women from broader socioeconomic backgrounds are needed. Second, this study took place during the COVID-19 pandemic. Many participants noted impacts of the pandemic on professional and social support systems and employment situations that had effects on their EE journeys. These context-specific findings cannot be generalized and necessitate further research on experiences of EE outside of a pandemic.

Conclusion

While more studies are needed on the experience and practice of EE, providers can use this information to provide better support to families that feed expressed milk. Providers should assess their knowledge of breast milk expression and what and how

information is provided to breast milk feeding families in their care. Inclusive language acknowledging all methods of feeding breast milk should be utilized and care should be taken to recognize the goals and unique needs of each family. Feeding directly at the breast may not be feasible or desired by all parents, but EE may be a viable option for some to provide breast milk. Parents should be informed and supported in these feeding decisions by their healthcare providers and an online presence may be a method for providing that support that warrants future exploration.

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Table 1

*Probing Questions***“Tell me about...”**

<p>“... how you made decisions about feeding your baby”</p> <p>“... your feelings about pumping and feeding pumped^a milk”</p> <p>“...your daily life while pumping^a for your baby?”</p> <p>“...your relationships with family and friends during your pumping^a experience</p>
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^a Participants and the general population from which the sample came from used the terms pump rather than expression.

Table 2.

Participant Demographics

	Intention to EE	Did Not Intend to EE	Total
	n=10 (%)	n=11 (%)	n=21 (%)
Race			
Asian	2 (20)	1 (9)	3 (14)
Black/African American	2 (20)	6 (55)	8 (38)
Hispanic	0 (0)	1 (9)	1 (5)
White, Non-Hispanic	5 (50)	3 (27)	8 (38)
Mixed- Race	1 ^a (10)	0 (0)	1 (5)
Marital Status			
Single	3 (30)	3 (27)	6 (29)
Married	7 (70)	8 (73)	15 (71)
Level of Education			
Some high school	0 (0)	0 (0)	0 (0)
High school diploma	1 (10)	1 (9)	2 (10)
GED	0 (0)	0 (0)	0 (0)
Some College	2 (20)	2 (18)	4 (19)
College Degree	4 (40)	4 (36)	8 (38)
Graduate school or higher	3 (30)	4 (36)	7 (33)
Income			
Under \$20,000	0 (0)	1 (9)	1 (5)
\$20,001-40,000	1 (10)	2 (18)	3 (14)
\$40,001-60,000	4 (40)	0 (0)	4 (19)
\$60,001-80,000	1 (10)	2 (18)	3 (14)
\$80,000 and above	4 (40)	6 (55)	10 (48)
Parity			
Primiparous	6 (60)	9 (82)	15 (71)
Multiparous	4 (40)	2 (18)	6 (29)
Birth			
Vaginal	8 (80)	9 (82)	17 (81)
Planned Cesarean	1 (10)	1 (9)	2 (10)
Unplanned Cesarean	1 (10)	1 (9)	2 (10)

^a Participant self-identified as Black and White

Conclusion

These findings provide insight into the experience and practice of exclusive expression which providers can use to provide better support to families that feed expressed milk. I found that these participants had a salutary breastfeeding experience and that the Situation-Specific Theory of Breastfeeding and its constructs are valid for use in this sample of women who EE. I also found that these participants experienced pressure from healthcare providers to feed at the breast, and concerns and goals of these participants were often missed opportunities for providers to support and offer education on EE. More studies are needed to assess the knowledge and attitudes of healthcare providers in regard to breast milk expression and to further explore the experiences of women outside of the context of a pandemic.

Chapter 5 Conclusions, Discussion & Future Considerations

Introduction

There are few studies examining the experience of EE-EBMF. In a preliminary study I conducted, I compared the experiences of participants who exclusively expressed to those who fed directly at the breast. All participants found satisfaction in providing breast milk to their infants, however, as all but one intended to feed directly at the breast, those who ultimately practiced EE-EBMF were left with subsequent feelings of frustration and guilt that their experience did not match their intent. Because most participants practicing EE-EBMF in this study had prenatal intentions to DBF, these findings are not generalizable to persons with intentions to practice EE-EBMF. Additionally, there was a lack of ethnic diversity in the sample. Therefore, a gap in knowledge related to experiences of EE-EBMF among those of varying prenatal intentions and varying backgrounds existed. This prompted the use of sampling methods to attempt to fill these gaps for my dissertation study. This chapter provides an in-depth discussion of the findings of my dissertation study.

I recruited 21 participants from social media groups for women who express breast milk. I targeted groups specifically for people of color in order to recruit a racially diverse sample. During recruitment, potential participants were asked about their prenatal infant feeding intentions so that I could obtain a sample with those who intended to practice EE-EBMF and those who intended to DBF. I used narrative methods to conduct interviews to obtain their full stories of infant feeding from their perspective, consistent with feminist philosophical view from which I conducted the study. Consistent with

narrative interview methods outlined by Kim (2016) and the use of narrative in defining theoretical constructs (Becker, 1982), after participants finished the storytelling phase of the interview, I asked probing questions to explore whether the Situation-Specific Theory of Breastfeeding had validity for use in this population and more specifically how the construct of salutary breastfeeding could be defined by these participants' experiences. Care was taken to let their stories guide this portion of the inquiry rather than allow the theory to guide, and possibly overshadow, their voices.

Each interview lasted between 28 and 66 minutes in length. I took notes during interviews about facial cues, tone of voice, and body language in addition to my own thoughts as part of an audit trail and reflexive journaling to ensure trustworthiness. I listened to interviews to ensure accuracy of the transcriptions. After full reading of the narratives to gain familiarity, transcripts were read several times to develop codes which were then categorized into themes after confirming through peer debriefing. I conducted member checks with four participants who confirmed the thematic analysis of the stories.

I felt that saturation was achieved, and this was confirmed during peer debriefing with an experienced qualitative researcher. However, Kim (2016) notes that the human experience is unique and ever-changing and therefore true data saturation can never fully be achieved. This limits the external validity of the findings in that they may not be generalizable or transferable to others who EE. Therefore, recruitment continued until stories sounded similar and no new information was being gathered.

Summary of Findings & Conclusions

Research Question 1: What are the feeding experiences for women who exclusively express breast milk?

This study provides a unique contribution to the literature on breast milk feeding by detailing the experience of exclusive expression for term infants. An overarching theme was that participants felt unseen and unheard stemming from pressure to feed at the breast and subsequently received little support for their method from healthcare providers. Providers such as nurses, lactation consultants, and pediatricians “assisted” with direct breastfeeding by instructing repeated attempts to latch, but they did not listen to participants when they told them it was not working. Similarly, they encouraged latching and did not listen when participants had intentions to feed via EE. The dichotomy in feeding choices (direct breastfeeding or formula) meant that participants who practice EE-EBMF were not seen as breastfeeding mothers leading to feelings of frustration. Consequently, there were missed opportunities for healthcare providers to support and offer education on EE-EBMF. There was a lack of information sources and education on breast milk expression. Participants found much of their information and social support in online communities.

Despite this, participants spoke about the benefits to this method of EE-EBMF that worked for their lifestyles. They benefitted from the ability to share feeding responsibilities, facilitate bonding between not only between the infant and themselves but between the infant and others. They enjoyed the freedom that breast milk expression offered in that they could leave the infant with others. Time spent expressing milk

became a time for themselves that they could spend doing things that they enjoyed even though they felt reliant on the pump.

Breast milk expression was a time-consuming and sometimes expensive endeavor. However, most participants reported having an oversupply of milk. This enabled them to continue feeding after stopping production of breast milk and to even donate milk if they chose to do so. They expressed pleasure in the prospect of being able to discontinue producing milk prior to a year yet still feed breast milk to their infants. It was empowering for participants to see how much milk they produced. Participants also felt happy that their breast milk could support their infants' growth. Tracking this production also gave them a sense of control and satisfaction.

Research Question 2: How do women describe their infant feeding goals and intentions?

The main goal of these participants was to feed breast milk to their infants. To them, the method of feeding was less important than what was being fed to their infants. Almost half had intended to practice exclusive expression. They described coming to that decision because they wanted to feed breast milk for its health benefits but for various reasons breastfeeding directly did not appeal to them. Despite some initially feeling guilt due to pressure from others, they were content with following their intentions and many conveyed that they would exclusively express again for a future infant. Those that intended to directly breastfeed also were motivated to form that intention by the health benefits of breast milk along with the prospect of developing a bond with their infant. Some found they did not enjoy directly breastfeeding and were not upset by not following that intention. Others initially felt guilt, frustration, and feeling as though they had failed,

but after accepting EE as their new method of breast milk feeding found that their real goal was to give their infants breast milk and were happy to be able to do so. Participants did not start out with long-term goals for how long they would feed breast milk such as 6-months or a year. Instead, they described setting step-wise short-term goals, such as one month at a time, that lengthened over the course of their journeys. At each step, they reassessed the manageability and their enjoyment of the process to decide to continue and lengthen their goals. In doing so, they were able to feel accomplished as they met each goal and moved onto the next.

Research Question 3: What factors influence women's experiences of infant feeding?

Narrative analysis of the infant feeding stories shared in this study highlighted common key events that shaped participants' experiences. For those that intended to practice EE-EBMF, their in-hospital stays influenced their feelings about their EE-EBMF decisions. While in-hospital, participants felt pressure to feed at the breast as healthcare providers missed opportunities to support their EE-EBMF intentions. Some felt this pressure so strongly that they did attempt latching their infants to breast while in the hospital until they arrived home where they could EE-EBMF. This experience was frustrating and many expressed feelings of guilt. When they were home and able to follow their intentions to EE, participants felt control over their bodies and decisions. For many that intended to directly breastfeed, difficulty latching in the beginning was a turning point in their feeding journeys that led them to EE-EBMF. The establishment of a stable milk supply allowing for decreasing time spent expressing was also a turning point in participants' confidence in the ability to continue feeding breast milk.

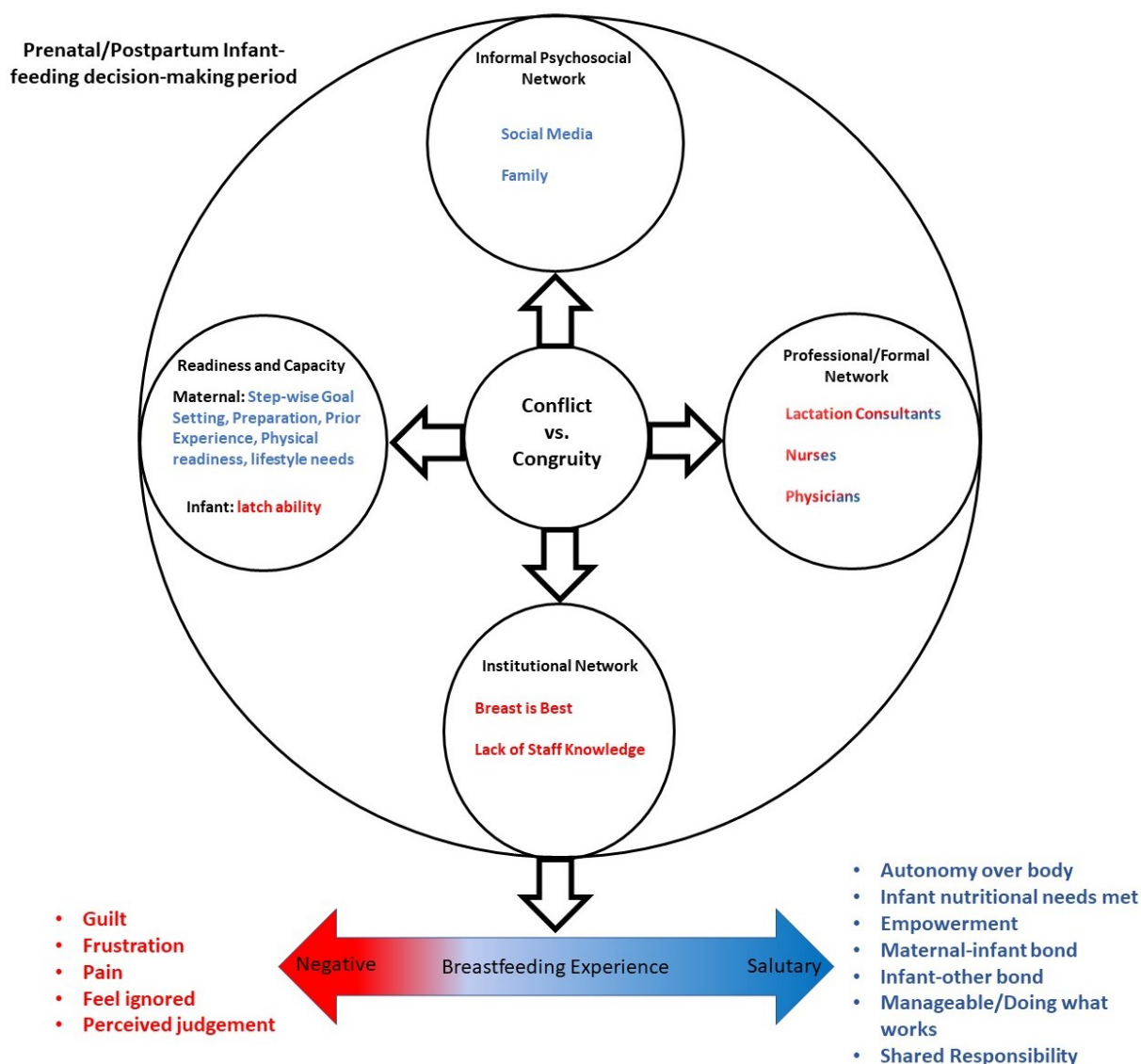
Interactions with others were also events that played a role in participants' experiences of EE-EBMF. When these participants encountered unsupportive interactions, they had more negative feelings such as guilt and frustrations. Examples included pressure from healthcare providers to DBF, missed opportunities for education or assistance with DBF or EE-EBMF, lack of acknowledgement of EE-EBMF as breastfeeding, or judgement from others for bottle-feeding. When these participants had interactions that were more congruent with their own goals, they had more positive experiences and feelings such as freedom, empowerment, and bonding with their infant. Examples included help from social media groups or providers in learning about pump equipment and strategies and family members' assistance.

Research Question 4: Do the narratives of women who exclusively express breast milk detail characteristics of salutary breastfeeding?

Participants' narratives included details of their experiences that align with criteria for salutary breastfeeding as defined by the Situation-Specific Theory of Breastfeeding (Nelson, 2006). Details from participants' stories begin to give insight into the applicability and validity of this theory for women who EE-EBMF. Figure 2 depicts how these participants' stories align with the theory and described details consistent with criteria for salutary breastfeeding (Nelson, 2006).

Figure 2.

Adaptation of The Situation Specific Theory of Breastfeeding in Women who Exclusively Express Breast Milk



Note. This model shows the infant-feeding decision-making period during which women and infants interact with institutional, informal psychosocial, and formal/professional support networks. When there is conflict (red) between these networks and maternal/infant readiness, capacity, or goals, there is movement toward a more negative breastfeeding experience. When there is congruence (blue) between them, there is movement toward a more salutary experience (blue).

A proposition of the theory is that conflict with support systems can lead to a more unsatisfactory experience while congruity between maternal goals, readiness, capacity, and those support systems leads to a more salutary breastfeeding experience. Areas of conflict that these participants experienced are displayed in red, while areas of congruence are in blue. Criteria for a salutary breastfeeding experience include that it is empowering, fosters the maternal-infant relationship while protecting other relationships, enjoyability and manageability that create a balance between meeting infant and maternal needs. The ways in which these stories represented these criteria is noted by the salutary end of the spectrum while events more consistent with a negative experience are on the opposite end of the spectrum.

Participants experienced a clash with the “breast is best” moto because they felt it did not include them fully as the baby was not at the breast. Instead, their choice was to provide breast milk in a way that worked for them to meet the needs of their lifestyle. This led to guilt for some and a lack of acknowledgement of their BMF method for others. Overall, a lack of support and education for EE-EBMF led to frustration, perceived judgement, and feelings of being ignored. Participant interactions with healthcare providers were mixed. Some were viewed as helpful, but for others, healthcare providers did not provide education about EE-EBMF as an option. Another area of conflict for participants who had intended to DBF was between their own readiness and capacity and their infants. Some of these infants were not able to latch effectively despite participants’ efforts. This led to pain and frustration until they turned to EE-EBMF.

Participants prepared either prenatally or during the postpartum period through the assistance and support of social media and family and in some cases their reliance on

previous experiences. When participants experienced this congruence between their goals and readiness to practice EE-EBMF, they felt empowered, enjoyed facilitating bonding with their infants, and they were able to create a manageable experience that met the nutritional needs of their infant while also meeting their needs for shared responsibility and what worked for them. Participants identified that EE became manageable through routines and strategies to decrease time spent expressing and that they were satisfied and empowered by their abilities to support their infants' growth. Participants felt that bonding was established between mothers and infants and with other family members that were able to share feeding responsibilities.

In the Situation-Specific Theory of Breastfeeding, Nelson (2006) posits that increasing levels of conflict can push movement towards an unsatisfactory breastfeeding experience instead of supporting a salutary experience. Indeed, these participants described times that their goals clashed with those of providers and subsequently described negative feelings such as guilt, frustration. Conversely, when they received informational or social support, they reported feelings of empowerment and satisfaction with their experience. Therefore, this study begins to provide empirical evidence for the propositions posited by this theory and depicts how persons practicing EE-EBMF experience salutary breastfeeding.

Discussion

This study supports the existing literature showing that promoting only exclusive direct breastfeeding as the superior method of infant feeding and focusing on the health benefits ignores the realities that women face (Brown, 2016) and creates a dichotomy leaving women feeling guilty and frustrated when their breastfeeding method goals are

not met (Benoit et al., 2016; Fallon et al., 2017; Hvatum & Glavin, 2017; Komninou et al., 2017; Stallaert, 2020). In this study, participants still were met with feelings of guilt and frustration due to this pressure even when they did meet goals of EE. Dietrich Leurer et al. (2020) did not study EE specifically but found that participants who had ever fed expressed milk reported feeling negatively judged by healthcare providers for it. It has been suggested that “creating an equal platform for all feeding options” (p.203) may reduce these types of negative feelings (Brown, 2018). Providers should assess lifestyle needs and goals of women in their care and present all viable feeding options. Supporting the needs and goals of the individual woman provides a more woman-centered approach to BMF support that may create a more positive feeding experience. More studies are needed to examine provider perceptions and knowledge of EE-EBMF to address this issue.

Online platforms such as Facebook, Instagram, and YouTube were important in meeting participants’ information and support needs regarding milk expression. This is not unexpected given that the sample was recruited through the use of such online support communities. However, in participants’ own searches for resources they found little information from pediatricians or scholarly sources such as libraries or healthcare organization websites. Similarly, Strauch et al. (2019) conducted a scoping review of literature regarding community support for EE-EBMF but did not find any scholarly articles examining support for EE-EBMF. They did, however, find that that information sources about EE-EBMF included online parenting forums and one-way information websites and blogs. Similarly, Dietrich Leurer et al. (2020) also found that milk expression information needs were often not addressed by healthcare providers for those

who express milk in any amount. With respect to exclusive expression, there are few information sources or classes available leaving many to do their own research from websites and online forums (Jardine, 2019). As women are looking to the internet for information, an online presence may be a method for healthcare professional to provide more support and information to this population, but studies are needed on the exploration of social media as a tool for providing that support.

Eleven of the participants in this study intended to directly breastfeed. A few found they did not like directly breastfeeding and preferred EE, but many turned to EE-EBMF after difficulties or pain with latching. Pain, difficulty latching, and perceived insufficient milk supply have been identified as factors leading to early discontinuation of breastfeeding (Bai et al, 2015; Balogun et al., 2015; Newby & Davies, 2016). Additionally, Jiang et al. (2015) found that of women practicing EE-EBMF, 89% had reported latch or suck problems. Of women who practice any breast milk expression, latch problems and breastfeeding difficulties have been commonly cited reasons (Binns et al., 2006; Flaherman et al., 2016). The practice of exclusive expression may offer a way to continue providing breast milk despite these common challenges. Women need more skilled lactation support when encountering breastfeeding challenges when they want to continue efforts. However, they should also be supported when they decide to continue feeding breast milk by other means if it meets the needs of the individual. Women who want to feed breast milk but do not enjoy directly breastfeeding should be offered EE-EBMF as an option.

Many who intended to practice EE-EBMF from the onset chose this option so that others could feed the infant, especially when planning to return to work. This is

consistent with findings that women, when employed prenatally, are more likely to express breast milk than not at all (Labiner-Wolfe et al., 2008). Geraghty et al. (2012) also found that women are more likely to begin expressing in the early postpartum period when planning to return to work within 6 months of birth. Direct breastfeeding exclusively for 6 months may be an unrealistic and unattainable goal for many American women. Sixty percent of mothers of children under one year of age participated in the labor force in 2019 (Bureau of Labor and Statistics, 2020) and there is no mandatory paid maternity leave in the U.S. Longer and paid maternity leave has been associated with increased breastfeeding initiation duration in the U.S. and globally (Mirkovic et al., 2016; Navarro-Rosenblatt & Garmendia, 2018; Stuerer, 2017). In addition to longer maternity leave, Stuerer (2017) found that workplace policies such as breaks and private space for breastfeeding or milk expression were facilitators to continued breast milk feeding. As this study was conducted during the COVID pandemic, some participants worked from home when they returned to paid employment. They noted that they thought milk expression was easier in the privacy of their own home than in an office or field setting where facilities may not be as comfortable. Policies allowing for paid leave or flexible remote work may be more conducive to making exclusive breast milk feeding goals attainable for women re-entering the labor force soon after birth.

This study was conducted using a feminist philosophical perspective. Pressure to feed at breast is also an example of the moralization of infant feeding that has been critiqued by feminist scholars (Drouin, 2013). These participants were able to strike a balance between being empowered by their ability to produce milk and the constraints of the role of feeding the infant. Although at times they felt “tied to the pump” in a similar

way to DBF women who must be with their infant, they also felt freedom to leave or return to work knowing their baby could easily be fed their breast milk by others. This made them feel that the transition to work was easier. McCarter-Spaulding (2008) notes that breastfeeding from a liberal feminist stance is a “gender difference that stands in the way of liberating women” (p.207). Furthermore, in the U.S. there is no paid maternity leave requirement which places social constraints on women who want to provide breast milk. EE-BMF is a method that these participants chose to continue and enjoyed.

Feminist scholars and healthcare providers should acknowledge that this is a method that may offer some women control and autonomy in the face of social constraints such as lack of maternity leave. The shared responsibility of infant feeding experienced by women who EE could be seen from this stance as a more equitable form of breastfeeding and allow for greater autonomy to be separated from their infants.

Inclusive language acknowledging all methods of feeding breast milk should be utilized and care should be taken to recognize the goals and unique needs of each family. Feeding directly at the breast may not be feasible or desired by all parents, but exclusive expression may be a viable option for some to provide breast milk. When speaking to women about their intentions for infant feeding, it is important to find out the kind of milk (breast milk vs. formula) they intend to feed but also their intentions for what kind of experience they would like to have. This can create a more open-ended discussion that can illuminate women’s reasons for choosing certain methods so that providers can discuss various options to meet the needs of each individual woman. In discussing goals, healthcare providers should help women create attainable goals and celebrate victories in meeting those goals even when they do not meet standards set by healthcare agencies.

Implications

Research

In qualitative research originating from a constructivist paradigm, it must be acknowledged that historical and social contexts within which the research is conducted have the potential to influence interpretation of the data (Scotland, 2012). The realities experienced by the participants is also linked to these contexts. This research was conducted during the COVID-19 pandemic. Participants acknowledged that the pandemic influenced various aspects of their EE-BMF journeys such as ease of milk expression while working from home and maintaining milk expression routines due to stay-at-home orders. Additionally, the researcher's experiences during the pandemic could have biased the interpretation. For instance, healthcare organizations and lactation advocacy groups released social media announcements promoting breastfeeding for immune benefits and there was debate regarding the separation of mothers from their infants after exposure to COVID-19. While I practiced reflexivity to limit the potential to impose my own beliefs on interpretation of the narratives, exposure to such media could have influenced my beliefs and thus the co-construction of knowledge during the research process. Therefore, it is necessary to explore these experiences outside of the context of a pandemic.

EE was not provided as an option when providers asked questions pertaining to infant feeding. More research is needed to determine how to obtain more accurate and specific surveillance data that acknowledges this method of breast milk feeding along with a nomenclature system that can be adopted by researchers to more accurately describe trends and factors related to breast milk feeding. Additionally, studies are

needed to explore the attitudes and knowledge of providers on EE-EBMF and whether interventions providing anticipatory guidance on milk expression has effects on BMF behaviors and experiences. As other studies have found EE-BMF to be a risk for early weaning, more quantitative studies are needed to identify social and contextual factors involved in early weaning in women who EE-EBMF. The use of social media or internet-based support by providers should also be investigated as many women use the internet to find information.

Research using wider samples are needed. Inclusion criteria also required that participants be over the age of 18. There may be adolescents that find EE-EBMF to be a viable strategy for providing breast milk to their infants and research is needed in this population to gather their attitudes toward breast milk expression. Additionally, 62% of this sample were non-white making for an ethnically diverse sample. However, this is a small sample and results cannot be generalized to the experiences of all people that practice EE-EBMF. More studies are needed with larger samples including women from broader socioeconomic backgrounds are needed.

Practice

Participants in this study felt as though they were not seen as breastfeeding mothers when providers asked infant feeding questions that did not include EE-EBMF as an option. They also felt unsupported in their goals due to a pressure to feed at the breast. This study sheds light on a method of infant feeding that needs to be incorporated in healthcare provider practice and education provided to families. Provider attitudes toward breast milk expression and their potential impact on maternal emotions and infant feeding outcomes should be explored. Awareness that EE-EBMF is an option and knowledge of

this experience will help providers use language inclusive of EE-EBMF when discussing infant feeding options. Recognizing that EE is a choice that works for some women's lifestyles may make them feel more supported in their decisions. Providing education on EE also provides true informed decision-making.

The ability to create and manage an oversupply of breast milk that allows women to discontinue breast milk production prior to discontinuation of breast milk feeding may be important to some women in allowing them flexibility and control over their bodies. It is known that the health benefits of breast milk for infants are dose-dependent. As such, women with an oversupply who would like to discontinue milk expression should be encouraged to continue providing stored breast milk to provide additional benefits for their infants.

Inclusive language acknowledging all methods of feeding breast milk should be utilized and care should be taken to recognize the goals and unique needs of each family. Feeding directly at the breast may not be feasible or desired by all parents, but exclusive expression may be a viable option for some to provide breast milk. When speaking to women about their intentions for infant feeding, it is important to find out the kind of milk (breast milk vs. formula) they intend to feed but also their intentions for what kind of experience they would like to have. This can create a more open-ended discussion that can illuminate women's reasons for choosing certain methods so that providers can discuss various options to meet the needs of each individual woman. In discussing goals, healthcare providers should help women create attainable goals and celebrate victories in meeting those goals even when they do not meet standards set by healthcare agencies.

Education

Participants in this study reported that providers lacked knowledge regarding the practice of EE-EBMF and pressures to feed at the breast. Educators in the health professions can use this to incorporate more BME education into lactation education. Healthcare providers should receive education on the use of breast pumps and breast milk storage to provide assistance or answer questions related to BME. Patient educational resources can also be improved to include more prenatal guidance on breast pumps and EE-EBMF as an option. Patient education can be made available online to increase accessibility to reputable sources.

Conclusion

While more studies are needed on the experience and practice of exclusive expression, providers can use this information to provide better support to families that feed expressed milk. Providers should assess their knowledge of milk expression and what and how information is provided to breast milk feeding families in their care. In counseling families on breast milk feeding, healthcare providers should discuss both advantages and disadvantages of various feeding methods that that families can make informed decisions about infant feeding that will work for them and meet their needs. Parents should be informed and supported in these feeding decisions by their healthcare providers and an online presence may be a method for providing that support that warrants future exploration.

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