Mount Saint Vincent University
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“That's definitely a part of who we are”: Nova Scotian mothers managing embodied identities and navigating expectations via dual modality feeding

by
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Abstract

Background: Human milk is considered to be the optimal food for infants due to associated health benefits. With that, feeding human milk is frequently equated with breastfeeding, despite the growing prevalence of human milk expression in high-income countries and the known impact of feeding modality on health outcomes. Little is known about the experiences of mothers who breastfeed, and express and bottle-feed human milk (i.e., practice dual modality feeding). However, the experience of dual modality feeding is likely unique, and situated differently within the pervasive culture of intensive mothering, as well as external and internalized expectations that women negotiate.

Main research objective: To explore the lived experiences of Nova Scotian mothers practicing dual modality feeding during the first five months postpartum.

Methodology and methods: This research is guided by an interpretive phenomenological approach. Data were collected via repeated, semi-structured, one-on-one interviews. First, data were deductively coded and thematically analyzed. Data analysis was guided by a theoretical framework comprising feminist new materialism, intersectionality, and elements of critical health studies. Moreover, inductive coding was employed, from which a theoretical model of dual modality feeding was developed.

Findings: The experience of dual modality feeding is distinct and involves constant negotiation of tensions among three aspects of women's self-identity, which are collectively theorized as the Tri-Self: Motherself, Womanself, and Otherself. These identities are embodied and formed under the expectations of feeding culture, the lactating body, and the non-feeding world (i.e., all areas of life unrelated to motherhood), respectively. The women who participated in this study attempted to satisfice the needs of each aspect of their self-identities by performing actions that prioritize one of the identities and suspend the others. Practical aspects of dual modality feeding emphasize choosing a feeding method based on circumstances and dealing with various challenges in the context of the feeding culture, social circumstances, and supports. Moreover, dual modality feeding plays an important role in the overall motherhood experience.

Conclusions: Dual modality feeding occupies a unique space within the culture of intensive mothering. Dual modality feeding mothers experience high levels of pressure and expectations tied to the feeding culture. Due to the inadequacy of available supports, feminist-informed support programs and advocacy tailored to dual modality feeding families are needed.

Dedication

To all mothers out there. I bow to you.

***

С пониманием и благодарностью

Когда глубокой темной ночью
Ты смотришь внутрь и наразрыв.
Поверь мне, я ведь знаю точно,
О чем мы здесь все говорим.

Одно, другое там, и третье,
А дальше просто не вдохнуть.
Как будто кто-то душу плетью
И раз, и два, и в добрый путь!

И голоса твердят наперебой,
Что ты им всем и все должна.
Но те приходят и уходят,
А ты-то у себя одна.

И там ведь есть еще хоть что-то,
Пусть даже очень далеко.
Я знаю. Нет, я верю!
Спасибо им. А вам поклон.

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As I sit on my balcony on a sunny summer Halifax day with a large cup of black coffee and write this section, I think about how incredibly privileged and honored I am to have been able to do this work.

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Table of contents

Abstract **3**

Dedication **4**

Acknowledgements **5**

Table of contents **7**

List of tables **9**

List of figures **10**

List of abbreviations **11**

1. Introduction **12**

2. Terminology **13**

3. Literature review **14**

3.1. Health benefits of feeding human milk *14*

3.2. Breastfeeding as an ideological phenomenon *16*

3.3. Modalities of feeding human milk *18*
3.3.1. Human milk expression 20
3.3.2. Feeding of expressed human milk 22
3.3.3. Commodification and commercialization of feeding human milk 23

3.4. Determinants of feeding human milk *25*
3.4.1. Geographic trends 26
3.4.2. Socioeconomic factors 26
3.4.3. Cultural factors 27
3.4.4. Familial factors 28
3.4.5. Individual factors 29
3.4.6. Cessation of human milk feeding 30

3.5. Experience of feeding human milk *31*
3.5.1. Breastfeeding experience 31
3.5.2. Experience of expressing and feeding expressed human milk 33
3.5.3. Guilt and shame 34
3.5.4. Feeding human milk in public 35

4. Research gap and significance **39**

5. Research objective **39**

6. Theory and methodology **40**

6.1. Theoretical framework *40*

6.2. Research methodology *43*
6.2.1. Researcher's positionality 44

6.3. Research methods *45*
6.3.1. Recruitment and sampling 45
6.3.2. Data collection 45
6.3.3. Data analysis 46
6.3.4. Ethical considerations 46

7. Results and discussion **48**

7.1. Participants *48*

7.2. The Tri-Self: A theoretical model of women's experiences of dual modality feeding *51*
7.2.1. Managing embodied identities 54
7.2.2. Motherself in the feeding culture 55
7.2.3. Womanself in the lactating body 65
7.2.4. Otherself in the non-feeding world 72

7.3. Feeding and everything else that comes with: Practices of dual modality feeding *77*
7.3.1. "But generally, it's just the breast": Choosing a feeding method based on connection and convenience 78
7.3.2. "I thought it'd be easy, and it wasn't": Dealing with feeding challenges and concerns 80
7.3.3. "They always say you can use breastmilk for everything": Non-feeding uses of expressed milk 83
7.3.4. "[A]t least a year if not longer": The road ahead 85

7.4. Implications for future support programs *87*

8. Study limitations **90**

9. Conclusions **91**

References **92**

Appendices **107**

List of tables

Table 1. Demographic characteristics of study participants 49

Table 2. Biosketch of study participants. 50

List of figures

Figure 1. The Tri-Self: A theoretical model of the experience of dual modality feeding. 53

Figure 2. Conceptual framework of reasons and enablers of dual modality feeding in the Canadian context. 88

List of abbreviations

CCHS – Canadian Community Health Survey

CI – Confidence interval

EHF – Exclusive human milk feeding

HIC – High-income country

IBCLC – International Board-Certified Lactation Consultant

IPA – Interpretive phenomenological analysis

IQ – Intelligence quotient

LGBTQQI – Lesbian, gay, bisexual, transgender, queer, questioning, and intersex

LMIC – Low-middle income country

MSVU – Mount Saint Vincent University

OR – Odds ratio

REFINE – Responsive Feeding of Infants with Expressed Milk

RH – Relative hazard ratio

UNICEF – United Nations Children's Fund

UPEI – University of Prince Edward Island

WHO – World Health Organization

1. Introduction

Feeding human milk is recommended across the globe as an infant feeding method that supports optimal growth and development, and decreases an array of health risks for mother and infant alike (1,2). Feeding human milk comprises infant feeding directly from the breast as well as other modalities, including bottle, cup, and finger feeding (3). The experience of feeding human milk is a gendered phenomenon that encompasses a variety of biomedical, relational, economic, sociocultural, political, and psychological aspects, and holds a multitude of meanings within the contexts of women's, infants, and their families' lives (4–6). In contrast, the dominant discourse positions feeding human milk within a neoliberal, positivist, healthist, and biomedical paradigm (hereafter referred to as the bio-healthist paradigm) that ignores the complex purpose, costs, benefits, barriers, and experiences of feeding human milk (5,7). Dominant discourse of feeding human milk constructs it as a health practice in part by focusing solely on its biomedical benefits for infants and mothers (5,7).

A bio-healthist understanding of feeding human milk shapes research, infant feeding recommendations, and promotional materials that emphasize the superiority of feeding human milk, but also human milk itself, to other feeding modalities or human milk substitutes (e.g., 'infant formula') (8). Public health messaging seldom specifies modality of feeding human milk, practically equating feeding at the breast with feeding expressed human milk any other way, despite known differences between feeding modalities (9). Human milk feeding modality may impact responsiveness of feeding (10–12), as well as nutritional and immunological properties of human milk (9,13). Moreover, maternal practices and experiences differ substantially in case of expressing and feeding expressed human milk in comparison to breastfeeding (10,14). An expanded and multifaceted understanding of women's experiences of feeding human milk is required in order to better support lactating mothers (5,6,15).

This research project used an interpretive phenomenological approach (16) and a theoretical toolkit comprised of elements of feminist new materialism (17), intersectionality (18), and critical health studies (19–21) to shed the light on the experiences of Nova Scotian mothers who concurrently practice breastfeeding and bottle-feeding expressed human milk (hereafter referred to as dual modality feeding) over the first five months postpartum.

2. Terminology

Feeding human milk is commonly referred as 'breastfeeding' which can be a source of confusion considering the prominence of human milk expression ('pumping') in high-income countries (HICs) (3,9,22). My thesis proposal centers the experiences of mothers who feed directly from the breast, and express human milk and bottle-feed human milk to the infants. Along with associated chores and non-feeding uses of human milk, I collectively refer to these practices as 'dual modality feeding'.

I use the term 'breastfeeding' to refer to direct feeding at the breast only. If the modality is not specified, I use a more general term 'feeding human milk'. In HICs expressed human milk is typically delivered via bottle versus other possible means (10). Hence, I use the term 'bottle-feeding' to refer to the practice of feeding expressed human milk. Although expressing human milk for donation and feeding donor human milk occur in the Canadian context (23), these practices are beyond the scope of this study. Therefore, I use the term 'human milk' to refer to mother's own milk. In cases where I discuss bottle feeding of human milk substitutes (e.g., formula feeding), this is explicitly stated.

I recognize that feeding human milk is not exclusive to cis-gender women or birth-mothers to the infants who are being fed with human milk (24). Diverse members of the lesbian, gay, bisexual, transgender, queer, questioning, and intersex (LGBTQQI) parent community who feed human milk may not identify with the terms 'mother' and 'breastfeeding', potentially preferring the use of terms such as 'parent' and 'chestfeeding' or 'co-nursing' among other options (24,25). There is a body of literature that outlines unique challenges experienced by the LGBTQQI parents and calls for better lactation supports for LGBTQQI families (25). Although I acknowledge the importance of research, education, and support of LGBTQQI parents in the area of feeding human milk, this goes beyond the scope of this inquiry. Therefore, I use gendered terms such as 'mother' and 'female' throughout this manuscript.

3. Literature review

3.1. Health benefits of feeding human milk

Human milk is recognized worldwide as the optimal food for infants because it is associated with myriad health benefits (2). Currently, the World Health Organization (WHO) recommends 'exclusive breastfeeding'[1] of all infants until 6 months of age, when human milk is accompanied by appropriate complementary feeding for up to two years and beyond (2). Health Canada, the Canadian Paediatric Society, Dietitians of Canada, and the Breastfeeding Committee for Canada issued a joint statement that supports the implementation of WHO recommendations for infant nutrition, including the overall duration of feeding human milk, as well as the specific six-month duration of exclusive human milk feeding (EHF) (26).

The numerous benefits of human milk for infants are well-researched and supported by extensive evidence (1). It is also well-known that human health is shaped by a multitude of factors, including the social determinants of health (27). In Canada, these include Aboriginal status, race, gender, ability, income, housing, early life, education, employment, working conditions, job security, social exclusion, food security, social safety net, and health services (27). Therefore, the benefits of feeding human milk presented below should be interpreted with caution and understood in the context of the aforementioned social factors that may have a greater influence on health outcomes (27).

Consumption of human milk supports optimal growth and development and is associated with decreased risk of an array of acute diseases and chronic conditions both in infancy and later life (1,2). Human milk is protective against infantile infection-induced morbidity and mortality (1), as well as the incidence of non-communicable diseases (1,28). For instance, any consumption of human milk is associated with a 35% reduction (odds ratio (OR) 0.65; 95% confidence interval (CI) 0.49-0.86) in lifetime incidence of type 2 diabetes (1). Consumption of human milk for 6 months or longer increases the protective effect on childhood leukemia to 20% (OR 0.80; 95% CI 0.72-0.90) (29). In HICs, the protective effect of human milk consumption for any period of time on infant mortality is mostly attributed to the reduction in risk for sudden infant death syndrome and necrotizing enterocolitis, by 36% (OR 0.64; 95% CI 0.51-0.81) and

[1] 'Exclusive breastfeeding' is defined as feeding only human milk (using any feeding modality), without the addition of any other foods or liquids (including water) with an exception of medicines, vitamins, and minerals (2).

58% (OR 0.42; 95% CI 0.18-0.96) respectively (1). The six-month duration of EHF is particularly important as it was found that early introduction of other foods before 6 months is associated with early maturation of infant gut microbiota (30) and higher risk of gastrointestinal infections (31).

Consumption of human milk is also associated with higher intelligence quotient (IQ) test results (1,32). For instance, a 30-year prospective Brazilian study (n=3493) showed that adults who were fed human milk for one year had, on average, intelligence quotient (IQ) scores 3.76 points higher (95% CI 2.20-5.33), and had attained 0.91 more years of education (95% CI 0.42-1.40) and significantly higher monthly incomes, compared to peers who were breastfed for less than a month (32). This association held after adjusting for multiple confounders, including maternal age, education, income and smoking, as well as infant factors including gestational age, birthweight and type of delivery (32). The adjustment of the data in the aforementioned study is of particular importance as the demographic and socioeconomic differences between mothers who do and do not breastfeed are well-known and widely considered as confounding factors in this area of research (28). Geographic, socioeconomic, demographic and other determinants of feeding human milk will be discussed in detail later (see Section 3.4).

Human milk has a biologically appropriate nutritional composition and contains a multitude of bioactive components, including anti-pathogenic, anti-inflammatory, and immunomodulatory molecules that are believed to compensate for the deficiencies of newborns' developing immune systems (33). Besides the unique composition of human milk, the process of feeding at the breast itself is believed to contribute to its beneficial effects, specifically through increased infant satiety responsiveness (34) and maternal responsiveness to infant's feeding cues (35) (see Section 3.3).

Furthermore, feeding human milk is associated with significantly reduced risk of several types of cancer and type 2 diabetes among mothers that increase with longer lactation duration (1,36). Specifically, as compared to mothers who never fed human milk, the risk of ovarian carcinoma was lowered by 17% (OR 0.83; 95% CI 0.78-0.89), 28% (OR 0.72; 95% CI 0.66-0.78), and 37% (OR 0.63; 95% CI 0.56-0.71) among mothers who fed human milk for less than 6 months, for 6 to 12 months, and for a year or longer, respectively (36). Feeding human milk for any period of time is associated with a lowered risk of breast carcinoma by 22% (OR 0.78; 95% CI 0.74-0.82), extended to a 26% (OR 0.74; 95% CI 0.69-0.79) lower risk with breastfeeding for

12 months or longer (36). Moreover, the results of a recent 30-year U.S.-based prospective cohort study showed that feeding human milk has a graded protective effect on the incidence of maternal type 2 diabetes: authors reported a non-significant risk reduction in women who fed human milk for 6 months or less (relative hazard ratio (RH) 0.75; 95% CI 0.51-1.09), but a 48% (RH 0.52; 95% CI 0.31-0.87) significant risk reduction in those who fed human milk for longer than 6 months (37).

3.2. Breastfeeding as an ideological phenomenon

The discussion of feeding human milk cannot be limited simply to the health benefits it provides. Breastfeeding is a complex gendered, racialized, and classed sociocultural phenomenon that bridges women's private and public lives in the context of a patriarchal, capitalist, white supremacist society (20,38,39). Breastfeeding is a prominent feminist issue as it is deemed a symbol of motherhood, demonstrating nurturing and provision of nourishment, but can be also constructed as a duty that has to be performed in order to achieve a neoliberal notion of 'good mothering' (40–42).

Feminist thinkers have developed a multitude of contrasting perspectives of breastfeeding (6). For instance, in the liberal feminist perspective, breastfeeding is seen as a source of gender-based oppression that is rooted in heteropatriarchal assumptions about traditional female roles and the gendered division of labour (43). In contrast, in cultural feminism, breastfeeding is seen as an important maternal practice that represents a unique form of female embodied subjectivity and therefore, needs to be valued, embraced, and protected among women's rights (38). Through this perspective, feminist thinkers argue that breastfeeding should be included in feminist politics focused on changing structural and social environments so these can fully accommodate lactating bodies as they do non-lactating (male) bodies (44). Breastfeeding has also been analyzed as a particular material specificity of a female body in new material feminisms. This perspective rejects the dualism of culture and nature, as well as essentialization of breastfeeding experiences by exploring lactating bodies in contexts of biology, culture, history, technology, discourse, and social power relations these are situated in (45,46). The source of oppression is linked to privileging mind over body combined with medicalization of breastfeeding, that, in turn, devalued the importance of female embodied knowledge and situated lactating mothers under the purview of the patriarchal medical establishment (45).

Breastfeeding is shaped by the larger ideologies of contemporary western societies, most prominently, heteropatriarchy, capitalism, and neoliberalism (20). Breastfeeding is both an embodied practice and a heavily scrutinized and stigmatized gendered function controlled by the medical establishment in HICs (4,39,47,48). Breastfeeding is also shaped by the dominant discourses of medicalized 'good motherhood' and 'good citizenship' in the context permeated with inequalities and preoccupied with a moral obligation of good health (4,49–51). In contemporary western contexts health is viewed through a prism of individual responsibility and 'lifestyle choices' (52) that denies the impact of social determinants of health (27). Therefore, achieving good health by decreasing risks and choosing 'healthy lifestyle' is perceived as an obligatory component of 'good citizenship' (i.e., healthism) (53).

When viewed through a neoliberal lens, breastfeeding is positioned as one of the many health practices, and women who breastfeed are presented as making a particular 'choice' that brings them closer to the ideological goal of 'good mothering' (6,54). However, racial and class disparities in the rates of feeding human milk suggest that breastfeeding is a marker of social status and a privilege that is not equally available to all women (6,15,54,55). Moreover, despite a longstanding acknowledgement from WHO and United Nations Children's Fund (UNICEF) of breastfeeding as an "integral part of the reproductive process with important implications" (56), contemporary discourse often focuses on pushing women to make the 'right choice' to breastfeed (i.e., breastfeeding imperative) and thus, take personal responsibility for this major public concern, rather than situating feeding human milk among women's rights and social justice issues (6,15,38).

This positioning of breastfeeding as merely a 'choice' is inappropriate as numerous studies have shown that women in HICs feel extremely pressured to breastfeed while lacking necessary supports or the right to refuse it in a society that mandates that a 'good mother' acts selflessly and puts the interests of her child above all else (41,42,49,50,57,58). Similar to the discourse of pregnancy, infants' needs are seen as inherently more important than women's, which are often diminished as simply 'desires' (49,57,59). Therefore, contemporary mainstream positivist breastfeeding advocacy creates an obligation to breastfeed and works as "a disciplinary force enacted upon women, rather than a force working for women" (60), leaving those who cannot accomplish their own or prescribed breastfeeding goals with feelings of failure and guilt (42) (see Section 3.5.3).

Despite the societal acceptance of the breastfeeding imperative, women's work of producing and feeding human milk has been consistently undervalued (6,43). One of the notions that has been repeatedly linked to this phenomenon is the medicalization of infant feeding that led to the commodification of human milk and disembodiment of mothers who produce it (6,20,42) (see Section 3.3.3). Contemporary breastfeeding discourse focuses on the superiority of health benefits of human milk compared to human milk substitutes available in the marketplace (8). Therefore, breastfeeding can be seen as both reproductive and productive work, that, in turn, in the context of a neoliberal capitalist society, is separated from the product (6,8,20). The phenomenon of putting the value of breastfeeding on human milk rather than the whole feeding interaction has important implications as it contributes to the equalization of feeding at the breast with feeding expressed human milk in public health policies (6,9).

Human milk is often framed as the optimal food for infants (2), however the phenomenon of breastfeeding represents significantly more than just food; it has been described as a "complicated mix of food, biology, gender, caregiving and love" (7). While lactation is a biological function, it is important to consider breastfeeding as an embodied practice (45,48) and a sociocultural activity (40) that is shaped by the prominent ideologies of the contemporary western societies (20). These wider perspectives on feeding human milk augment the dominant reductionist biomedical representation of breastfeeding by emphasizing the complexity of this phenomenon and allowing for a more comprehensive analysis of the experiences of lactating mothers (4).

3.3. Modalities of feeding human milk

The term 'breastfeeding' is traditionally used to refer to feeding at the breast, where the processes of milk being removed from the breast and fed to the infant occur simultaneously (3,9). However, 'breastfeeding' is sometimes used to refer to human milk feeding without differentiating feeding modality which may include direct feeding at the breast, as well as expressing milk and having the mother or another caregiver feed it to an infant using a bottle, spoon, finger, or cup (3). Research similarly lacks nuance in understanding if and how various feeding modalities may differently impact infant and maternal outcomes and experiences (9,14). Moreover, common terminology and research overlook the process of expressing human milk

itself despite the staggering prevalence in HICs across the globe (9), including a burgeoning group of exclusive pumpers[2] in the United States (61).

Equating breastfeeding and bottle-feeding expressed human milk has raised various concerns related to infant health outcomes. These include issues around food safety of the expressed milk (e.g., pathogenic bacterial contamination), nutritional and immunological properties of expressed milk (9,13), potential development of nipple confusion (62), as well as altered responsiveness of the feeding (10–12).

Responsive feeding comprises a set of caregiver behaviours during feeding that involve identification and appropriate response to infant's hunger and satiety cues (63,64). It is based on the notion that infants have an innate ability to self-regulate food intake to meet their nutritional needs, and cue caregivers with various signals to indicate hunger and fullness at different ages (65). Since infants are entirely dependent on caregivers for the provision of food, their self-regulation has the potential to be overridden by controlling caregivers who exhibit non-responsive feeding behaviours (12). In contrast, responsive caregivers allow the infant to lead the feeding (64) which fosters the development of the capacity for the ideal food intake self-regulation in later life (65).

Breastfeeding is associated with higher degree of responsiveness, in part because mothers have no visual cues to measure and control infant milk intake (12,35). In the case of bottle-feeding, caregivers are able to visually assess the amount of milk consumed by an infant and change feeding behaviours accordingly (10,65,66). These findings are supported by qualitative reports of mothers who were more commonly feeding on demand and following infant cues during breastfeeding, but following schedules and feeding pre-determined amounts of human milk during bottle-feeding (10). Some mothers prefer bottle-feeding to breastfeeding due to perceived efficiency (based on decreased time of feeding) (67,68), which also raises concerns around responsiveness. Notably, it has been hypothesized that the differences in responsiveness between breastfeeding and bottle-feeding may be in part due to personality characteristics and parenting styles, with mothers who prefer to have more control choosing bottle-feeding over breastfeeding (35,69).

[2] 'Exclusive pumping' refers to a practice characterized by mothers feeding their infants with expressed human milk only, without any feeding at the breast (61).

3.3.1. Human milk expression

Human milk expression is mechanical removal of milk from the breast through compression of the breast by massaging (i.e., hand expression) or using a manual or electric breast pump (commonly referred as ‘pumping’) (70). Use of an electric pump is the most prevalent method of human milk expression in HICs (70,71). Electric-powered human milk expression can be done in isolation or combined with hand expression (known as ‘hands-on pumping’) (70), or even simultaneously with breastfeeding, which will not be explored further here.

The phenomenon of human milk expression has been known for centuries (13). Expression with a goal of colostrum removal was discussed by Avicenna (AD 980–1036), whereas expression of human milk for infant feeding is known to have been practiced by women since at least the 16th century (72). A breast pump was invented in the 19th century, although the first models were often ineffective and therefore, not used by many women (71,73). Modern breast pumps sold since the early 1980s made human milk expression more efficient, fast, convenient, and discreet (71,73). Technological advances in breast pump design along with drastically increased participation of women in the workforce and contributed to a major shift in feeding practices in HICs that has been considered “a quiet revolution” (73).

In HICs today, human milk expression is a prevailing practice. Data from the Infant Feeding Practices Study II collected between 2005 and 2007 shows that in the United States 85% of breastfeeding mothers of infants aged 1.5-4.5 months expressed at least once and 6% reported feeding with expressed human milk exclusively (74). More recently, all 40 participants of a small retrospective cohort study of the women who attended the Cincinnati Children’s Breastfeeding Medicine Clinic reported expressing their milk at some point between 2008 and 2010 (3). The results of the survey in Ohio showed that out of the mothers who fed human milk, 85% fed expressed human milk at least once and 7% fed expressed human milk exclusively in 2012 (75).

Data from Australia and Singapore suggest that the popularity of human milk expression may be continuing to increase across HICs. In Australia, its prevalence has increased notably, with 38% and 69% of mothers reporting expressing human milk in 1992-1993 and 2002-2003, respectively (76). Furthermore, a 2008 online survey with members of the Australian Breastfeeding Association found that 98% of mothers had some experience with expressing and 4% fed expressed human milk exclusively (77). In Singapore, exclusive pumping is considerably

more prevalent, with 9% and 18% of mothers feeding only expressed human milk to their infants between 2000-2001 and 2006-2008, respectively (78). To date, there is no Canadian data on the prevalence of human milk expression and exclusive pumping.

There is a wide variety of possible reasons for the increased popularity of human milk expression (22,71). These may include lactation challenges, such as difficulty establishing breastfeeding or latching, breast engorgement, mastitis, nipple pain, as well as concerns about either undersupply or oversupply of milk (68,71,77). Other potential factors also include involvement of other caregivers in infant feeding (10,68,71,74) and returning to work (10,71,74,77). Some mothers have also indicated that they express human milk for storage (10) or to maintain milk supply (14) with a goal of prolonging the overall duration of feeding human milk. Moreover, desire for body autonomy (68,79), past trauma and anxiety (22), as well as avoidance of stigma associated with either feeding at the breast in public (22) or formula-feeding (67) may also be important motivational factors for human milk expression.

Reasons to express human milk often change during lactation period and may differ from intentions held during pregnancy (14). Felice and colleagues argue that maternal motivations for human milk expression can be classified as elective and non-elective, as well as anticipated and unanticipated (14). Mothers more commonly report unanticipated non-elective reasons (e.g., milk supply-related concerns, need to supplement feeding at the breast) during the first month postpartum, whereas anticipated elective and non-elective motivations are more prominent later in the infancy (e.g., to create surplus of milk for storage, to replace feeding at the breast during necessary or desired separation from the infant) (14).

Most of the research on human milk expression available to date is based on the data from the United States, while Canadian research in this area is scarce. This is of particular importance as the U.S.-based findings may be not applicable to Canada due to the prominent differences in public health and parental leave policies, as well as healthcare systems between the two countries (80). For instance, American mothers identify having to return to employment soon after birth as a significant reason to express human milk (10). In the United States (on a federal level), women are only eligible for an unpaid leave for up to 12 weeks following childbirth (81). In contrast, in Canada, mothers are eligible for up to 15 weeks of maternity benefits, followed by a maximum of 35 weeks of standard or 61 weeks of extended parental benefits (82).

Not all Canadian mothers take full maternity and/or parental leave and those who return to employment while feeding human milk face major challenges with pumping in the workplace, even in healthcare settings. For instance, a recent article in The Canadian Medical Association Journal described lack of proper lactation accommodations, as well as adverse reactions from colleagues, experienced by Canadian doctors who continued feeding human milk after returning to work (83). Furthermore, a 2019 survey of 170 Canadian physicians revealed that 73% of mothers reported that the workplaces lacked adequate lactation spaces and 67% did not have enough time to express human milk during residency (84). Similarly, in a qualitative study from an Atlantic Canadian university, student mothers also identified specific challenges with pumping that were mostly related to the lack of appropriate lactation spaces (85). Participants resorted to expressing human milk in washrooms, as well as parked cars, and they experienced issues stimulating letdown due to feelings of stress, embarrassment, and discomfort (85).

3.3.2. Feeding of expressed human milk

Expressed human milk can be fed via a variety of means, including with a bottle, cup, spoon, syringe, or a finger (86). Although bottle-feeding remains a prominent way of feeding expressed human milk in HICs, if mothers are also breastfeeding it is currently recommended that bottles are not introduced before six weeks and alternative methods of feeding expressed milk are used to avoid nipple confusion (87).

Whereas feeding of expressed milk typically occurs concurrently with breastfeeding, the data on the impact of human milk expression on the overall duration of human milk feeding is conflicting. Human milk expression may prolong the overall human milk consumption period through the use of previously expressed stored milk. In a small U.S.-based cohort study, 95% of breastfeeding women fed their infants expressed milk along with breastfeeding; 25% of mothers continued to feed expressed milk after they stopped expressing and 13% fed expressed milk after they ceased lactation completely (3). In contrast, a secondary analysis of the data from the Infant Feeding Practices Study II showed that the mothers who expressed human milk at least once between 1.5 and 4.5 months postpartum ceased feeding any human milk six weeks earlier than mothers who fed at the breast exclusively (88). Moreover, increased frequency of human milk expression was associated with shorter duration of feeding human milk, with the greatest difference of 3.5 months seen between mothers who expressed more than 14 times in 2 weeks

and mothers who fed at the breast exclusively (88). Mothers who expressed with the outlined frequency stopped feeding at the breast 5.5 months earlier than the mothers who only fed at the breast, potentially indicating that although human milk expression can prolong the period of human milk consumption for an individual infant, it does generally negatively impact lactation duration (88). It should be emphasized that these results are based on the data from the United States, where mothers may turn to human milk expression due to the need to return to employment in the early postpartum period in an absence of the paid maternity leave, which is different from Canada (see Section 3.3.1).

Mothers who breastfeed and express human milk concurrently typically prefer to feed at the breast while leaving bottle-feeding to other caregivers (10,14). This preference may be related to the phenomenon of 'bonding' with an infant through feeding that is a prominent theme in women's encounters around human milk expression (68) and in the context of the contemporary 'involved fatherhood' discourse (89). Feeding at the breast can be perceived by the partners as a barrier to their bonding with an infant and therefore, lead to the feelings of exclusion, inadequacy, and incompetency that can be potentially countered by bottle-feeding, as well as involvement in other caring activities (90). The phenomenon of 'bonding' through bottle-feeding can be seen by mothers as beneficial for infants, as well as a more important and pleasurable 'bonding' option for other caregivers, especially, partners, in contrast to other caregiving activities, such as bathing or diaper changing (68). On the other hand, 'bonding' through bottle-feeding may also be deemed inferior compared to 'bonding' through breastfeeding, potentially explaining mothers' preference for the latter (68). While some mothers feel pressure to facilitate 'bonding' for other caregivers (68,91), others experience guilt when their partners bottle-fed the infants, citing perceived infant's preference for the breast or questioning their partner's feeding practices (89). Moreover, when expressed human milk is fed by other caregivers, their feeding practices may differ from maternal approach (10). For instance, mothers reported that even if they fed on demand and followed infant hunger and satiety cues at home, other caregivers often relied on schedules and encouraged bottle-emptying (10).

3.3.3. Commodification and commercialization of feeding human milk

It has also been widely argued by feminist scholars that human milk expression may contribute to the further commodification and commercialization of feeding human milk because

it orients the focus on human milk as a product superior to human milk substitutes, which disappears from view the act of breastfeeding (89) and the bodies and reproductive labour of women who produce the milk (6,20,92,93). In other words, once human milk is expressed, it becomes a product that has its own value, separate from the maternal body that has produced it (8,20,89).

The commodification of human milk flourishes under the dominant ideology of capitalism that views bodies as merely a set of parts where breasts are milk production machines and transport systems that, if needed, can be substituted with another option available on the marketplace (8,20,92,93). Capitalism encourages the neoliberal language of free 'choice' that disregards the influence of the systems of power and oppression that put some members of society in less favourable circumstances and making some 'choices' unavailable to them (20). Moreover, under the capitalist ideology, productive work in the public sphere is valued more than reproductive nurturance work in the private sphere, which, in combination with commodification of human milk, creates a situation where women are encouraged, and often without choice but to combine early return to paid employment with human milk expression (6). In this case, expressed human milk holds an additional value as a gateway to increased earning potential (89).

Commodification of feeding human milk is present in maternal descriptions of breastfeeding dominated with mechanistic notions of time and measurement (93). The prominence of commodification and commercialization of feeding human milk are particularly evident in how mothers who express human milk describe their experiences and motivations to express their milk (89,94), as well as how feeding human milk is portrayed on the Internet (95), social media (96), and in public health materials (89). Women conceptualize expressing human milk as manufacturing a product with a significant exchange value due to its superiority to human milk substitutes, as well as the potential to be translated into increased earnings and amount of personal or social time (89). Human milk expression is also impacted by other commercial influences, such as from companies that produce breast pumps and other pieces of equipment that are positioned as necessary for the facilitation or improvement of the experience of feeding human milk (89,94,95). In a study by Taylor and colleagues, first-time mothers (even those with limited incomes) described that they felt the need to buy a wide variety of products (e.g., various types of bottles and nipples, breast shields and shells, bottle warmers and sterilizers

etc.) that were presented as indispensable by the manufacturers in order to reach their lactation goals (94).

Commercial information about human milk expression provided by the manufacturers and distributors of pumping supplies is prominent on the Internet and often replied upon in place of advice from health professionals that is limited in this area (94,95). Information available on the Internet is often inconsistent and biased toward expression using commercially produced breast pumps rather than hand expressing (95), despite the evidence that suggests that both options are equally effective and safe when done correctly (13). Therefore, commercial influences create the perceived need for human milk expression using a breast pump, potentially exacerbating the inequalities that may prevent women from being able to feed human milk (95).

3.4. Determinants of feeding human milk

The health benefits of feeding human milk for both mothers and infants are well-established (1). Feeding human milk is promoted by influential international organizations such as WHO (2) and UNICEF (97), as well as national (98) and provincial public health departments (86,87). Feeding human milk is considered a public health priority worldwide due to the potential to prevent over 800,000 deaths (1) and provide monetary savings of U.S.$300 billion per year (99). Moreover, considering the complex multilayered determinants of feeding human milk that are discussed in detail below, feeding human milk should be seen as a collective societal responsibility, rather than the responsibility of individual mothers (99).

Low rates of feeding human milk are not necessarily associated with a lack of knowledge or an informed choice not to breastfeed. For instance, recent research from the U.S. showed that although young women often have the knowledge of the benefits of feeding human milk and intentions to breastfeed, they face structural and societal barriers preventing them from following through with their plans (55). Although feeding human milk is established as a public health priority and a societal responsibility (99), it is not recognized among women's rights (6,15,38) or as a right of the infant to be fed (100). Despite a substantial body of knowledge suggesting that breastfeeding is associated with particular intersections of class, race, education, and marital status, breastfeeding promotional materials and public health messaging still present infant feeding through the neoliberal rhetoric of 'choice' (6,8,54). Specifically, women's ability to reach the WHO's recommended six months of EHF is impacted by the socioeconomic,

geographic, and social contexts of women's lives rather than a health practice that solely depends on individual mother's intentions, decisions, and actions (5).

3.4.1. Geographic trends

Rates of feeding human milk vary substantially across the globe (1). The highest prevalence of any human milk consumption at 12 months was shown in southern parts of Asia, sub-Saharan Africa and regions of South America, whereas most HICs report lower rates of feeding human milk (1). These range from less than 1% in the United Kingdom to 97% in Bangladesh, with variation between; for instance, 9%, 27%, 35%, and 86% in Canada, the United States, Norway, and Cameroon, respectively (1).

In Canada, in 2018, the vast majority of mothers initiated feeding human milk: 91% of mothers aged 18 to 34, and 93% of mothers 35 to 49 years of age (101). With that, only 33% of younger mothers (aged 18 to 34) and 42% of older mothers (aged 35 to 49 years) sustained EHF for the recommended 6 months (102). Rates of feeding human milk also vary regionally in Canada, from 24% and 29% of EHF at 6 months among Quebec mothers aged 18 to 34 and 35 to 49 years, respectively, as compared to 43% among younger mothers and 57% among older mothers in British Columbia (102).

In 2018 Nova Scotia reported among the lowest rates of initiation of human milk feeding in Canada: 86% of mothers aged 18 to 34 and 92% of mothers aged 35 to 49 years. The rates of EHF in Nova Scotia are also among the lowest in the country, with 22% of younger mothers EHF to 6 months, and no reliable published data for older Nova Scotian mothers (102). Nationally, there was no significant difference in the rates of initiation of human milk feeding and EHF between rural and urban areas according to the data from 2009-2010 Canadian Community Health Survey (CCHS) (103).

3.4.2. Socioeconomic factors

In HICs, including Canada, feeding human milk is well-known to be associated with high socioeconomic status (1), but the data should be analyzed carefully to distinguish between the determinants of initiation of human milk feeding and EHF as these often differ, with a few notable exceptions. Specifically, higher household income, higher education level, married or

common-law marital status, and non-Aboriginal status are consistently associated with higher initiation of human milk feeding and EHF rates nationally (103,104).

Mothers in the lowest income quintile and those who were widowed, separated, divorced, or single were significantly less likely to initiate human milk feeding (104). In 2011-2012, 77% of Canadian mothers who successfully EHF to 6 months were over 30 years of age; 76% had attained postsecondary education, and 91% were married or in common-law relationships (105). The results of 2009-2010 CCHS showed that mothers in the highest income bracket were significantly more likely to EHF to 6 months compared to mothers in the lowest and second-to-lowest income quintiles (103). There was no significant difference in the rates of EHF up to six months by immigrant status and racial background, with a notable exception of Indigenous mothers who were significantly less likely to feed human milk exclusively, compared to all other groups (103).

In Canada, recent immigrants (those who immigrated within the past 5 years) are more likely to initiate feeding human milk than women who were born in Canada or immigrated more than 5 years prior (104). However, there is no significant difference in the rates of EHF at 6 months postpartum between immigrant and non-immigrant, non-Indigenous mothers (103). Predictors of exclusive human milk feeding at 4 months differ among immigrant and non-immigrant mothers of various ethnical backgrounds, with an exception of a single factor – EHF at 1 week (106). Overall, the impact of migration on feeding human milk is complex and not limited to the acculturation and acceptance of the normative practices of the larger society but rather culturally constructed within a new geographic and social space (107,108).

3.4.3. Cultural factors

In HICs, breastfeeding has been criticized as being commodified, commercialized, and medicalized within the larger culture of 'scientific mothering' that puts emphasis on the biomedical understanding of feeding human milk controlled by the patriarchal medical establishment, rather than on women's work and experience of breastfeeding as a relational practice (6,20,42,109). Contemporary breastfeeding discourse has been described as contradictory due to the positioning of breastfeeding as 'natural' and 'easy', yet requiring medical surveillance, supervision, and prescription due to problematic 'unpredictability' of female bodies (42,45). This is apparent in public health materials that often present conflicting

messages, such as “Learning makes it natural” that can be found on the cover of *Breastfeeding Basics,* a book produced by the Government of Nova Scotia (87).

Historically, pregnancy, birthing, and breastfeeding were considered a women’s domain, defined by their embodied knowledge, while traditionally male-dominated medical establishment was concerned with treating adults (45,110). Prior to industrialization, infant feeding advice emphasized feeding on demand that was subsequently substituted in the 19th century with a reliance on feeding schedules, which has likely contributed to the prevalence of concerns with low milk supply, mistrust in the abilities of women’s bodies, and increased need for medical supervision (110). By the mid-19th century, the medical establishment embraced the invention of infant formula that was presented as a superior feeding option compared to breastfeeding, which was deemed ‘unpredictable’ and ‘unreliable’ (45,110,111). Later on, 1970s public outrage about unethical practices of major infant formula companies in low- and middle-income countries (LMICs) and the scientific research on benefits of human milk, allowed for the creation of the breastfeeding imperative that was defined on strict patriarchal biomedical terms (45,111). The infant feeding narrative became dominated by ‘expert’ advice, strict guidelines, medical monitoring, unrealistic expectations, and patriarchal norms, whereas the embodied knowledge of mothers was diminished (42,45). This has been made possible through the medicalization of breastfeeding, as well as institutionalization of midwifery and placing ‘expert’ status on people who may not have personal experience with breastfeeding, either as mothers or as infants (38,45). This cultural shift from breastfeeding to formula-feeding, back to the provision of human milk, disempowered and disembodied women by stripping them of the ability to create and pass on traditionally female feeding-related knowledge (45). Moreover, multiple drastic changes in infant feeding advice that occurred in a short time span created a gap in embodied knowledge and thus, lack of intergenerational mentorship and vicarious or personal experiences of breastfeeding (45) that may contribute to lack of confidence, anxiety, and isolation currently experienced by breastfeeding women in HICs (38).

3.4.4. Familial factors

Breastfeeding mothers are typically partnered, and infant feeding choices are known to be influenced by the preferences of partners and family members, specifically women’s mothers (112). In a Hong Kong-based study (n=1277) the odds of maternal EHF intentions were

increased by 32% (OR 1.32; 95% CI 1.13-1.55) with every additional family member who preferred feeding human milk (113). However, there is mixed evidence regarding the importance of partner preference. It is known that women are more likely to intend (OR 1.67; 95% CI 1.20-2.31) (113) and sustain EHF (RH of EHF cessation 0.8; 95% CI 0.6-0.9) if they perceive that it is their partner's preference (114). At the same time, in a study based in Scotland (n=108), Scott, Shaker, and Reid showed that even if the feeding attitudes of both parents are correlated, only the mother's preference is a significant predictor of the final infant feeding decision (115). Furthermore, partners also typically perceive birth-mothers to be the ones who should ultimately make the final decision about infant feeding (90).

Overall, the literature suggests that partner's preference for their infant to consume human milk, as well as support and involvement, positively impact initiation and duration of human milk feeding (114,116). The research with partners of breastfeeding mothers shows that partner's views are complex and often include both positive and negative attitudes. For instance, qualitative findings of an Australian study by Hansen, Tesch, and Ayton showed that partners viewed breastfeeding as healthy and natural for the infants but also potentially harmful for the wellbeing of struggling mothers and therefore, the family as a whole (117). Unlike mothers, partners prioritized perceived happiness and wellbeing of mothers and did not express feelings of failure in case of early cessation of human milk feeding (117).

3.4.5. Individual factors

The intention to EHF to 6 months is typically informed by a combination of behavioural, normative, control, and identity beliefs (5,99,118). Mothers cite health benefits of human milk as the main reason to breastfeed (79). Perceived benefits of breastfeeding also include the conceptualization of breastfeeding as 'natural,' crucial for 'bonding,' and paramount for 'good motherhood' (79).

Antenatal decision to feed human milk is a known predictor of initiation and overall duration of human milk feeding (5,99). Maternal exposure to breastfeeding and attendance at prenatal classes, as well as the perceived partner's and family members' preferences towards breastfeeding are all associated with higher intentions to feed human milk (113,118). However, mother's intention and initiation of human milk feeding do not guarantee EHF at 6 months even among well-educated and highly motivated women situated in socially advantageous positions

(119). Only personal experiences of breastfeeding previously or being breastfed as an infant were found to predict long-term breastfeeding outcomes by influencing attitudes, subjective norms, and self-efficacy (120), although research in this area is conflicting, potentially due to the level of satisfaction with previous experiences feeding human milk (121). Studies have found that experienced mothers are more likely to feed human milk exclusively for longer periods of time compared to first-time mothers (122). At the same time, short or negative previous experiences can adversely affect duration of human milk feeding with subsequent children (121,122). For instance, a recent Italian study showed that experienced mothers with negative previous breastfeeding experiences were less likely to breastfeed compared to first-time mothers (123). It has been hypothesized that significant lactation difficulties create an existential trauma that can result in a concomitant fear of future breastfeeding and a longing for it (124).

Certain personality and psychological factors have also been shown to influence breastfeeding outcomes. Mothers who report higher confidence and comfort breastfeeding in public, as well as greater levels of self-efficacy and positive body image, are more likely to report longer EHF duration (125). Moreover, positive emotions experienced during breastfeeding not only impact overall breastfeeding experience, but also limit cessation of EHF before six months (126).

Parenting style may also correlate with the duration of feeding human milk, specifically with less controlling parenting styles having a positive effect on EHF to 6 months (35,69). It is important to note that the relationship between parenting style and feeding method may be bidirectional, as mothers with more controlling styles may be more likely to choose bottle-feeding whereas mothers who choose breastfeeding may adapt a more infant-led parenting style (69).

3.4.6. Cessation of human milk feeding

Perceived insufficient milk supply is the main reason for early human milk feeding cessation that typically occurs in the first two weeks postpartum (127). Approximately 35% of women globally cease breastfeeding due to concerns of insufficient supply (128), however primary lactation insufficiency is considerably less common, with an estimated prevalence of 5% (129). Perceived insufficient milk supply is typically self-reported by women based on their perceptions of infant behaviours, such as crying, fussiness, and increased frequency of feedings

(127), whereas lactation insufficiency is diagnosed through an objective measurement of production and infant growth (130). Importantly, recent Canadian research found no significant correlation between actual and perceived insufficient milk supply with the latter being linked with maternal self-efficacy (130). The prevalence of the concern with perceived low milk supply is an important feature of the medicalized infant feeding paradigm that fosters mistrust in women's bodies, and therefore, a desire to accurately measure and compare its natural abilities to established standards (67,68,93) while failing to address the lack of appropriate social supports for breastfeeding women (110).

The two most common reasons for discontinuing human milk feeding before six months cited by Canadian mothers are "not enough breast milk" (44% of women) and "difficulty with breastfeeding technique" (18% of women) (105). In Nova Scotia specifically, 74% of women who cease human milk feeding before 6 months, stop during the first 6 weeks postpartum; 25% do so within the first week (131). Mothers who breastfeed for less than a week cited "inconvenience/fatigue due to breastfeeding" and "not enough breast milk" as the two main reasons, accounting for 23% and 20% of breastfeeding cessations, respectively (131). In contrast, for Nova Scotian women who stopped feeding human milk after 6 weeks, "personal decision" was the most common reason (22%), followed by "not enough breast milk" (21%) and "returned to work/school" (20%) (131).

3.5. Experience of feeding human milk

3.5.1. Breastfeeding experience

Maternal expectations of breastfeeding are often described as 'natural' and 'easy,' but vastly differ from the reality of breastfeeding which requires skill and practice, and is often troubled by various challenges (40,79,132–134). This discrepancy may negate prenatal intentions (135) and contribute to further disempowerment and isolation of breastfeeding women (134). In a recent Italian study, 85% of first-time mothers reported the experience of breastfeeding being different from their expectations (136). In contrast to idealized and potentially unrealistic expectations that may be influenced by health professionals and family members (40,79), breastfeeding women in Canada, Italy, and the UK described their early experiences as difficult, overwhelming, and painful, calling for better guidance and support both prenatally and during the postpartum period (132–134,136,137).

Lactation difficulties during the first week postpartum may be of particular importance, as these were found to be significantly correlated with ceasing human milk feeding by ten weeks (135). This association was not found after twenty weeks, potentially showing the development of self-efficacy by overcoming early lactation challenges (135). This phenomenon was corroborated in a Canadian qualitative study that showed that mothers who overcome difficulties had a sense of accomplishment and pride (133). Moreover, the prevalence of lactation challenges tends to decrease with infants age, with 70% of low-income American mothers reporting at least one difficulty at one month, which decreased to 45% and 29% at three and five months, respectively (138).

Maternal assessments of their overall breastfeeding experience, as well as particular aspects of lactation, vary significantly (133,136). Importantly, 25% of first-time mothers in an Italian study found their breastfeeding experience at three months to be substantially more positive than they expected (136) and 70% of French mothers (both first-time and experienced mothers) reported being very satisfied with their experience at six months (139). Similarly, the majority of first-time and experienced mothers in a Canadian study viewed their breastfeeding experience as positive overall, describing various positive feelings and particular appreciation related to 'bonding' with an infant (133). It has been hypothesized that the change in perception of the satisfaction with an overall experience of a complex phenomenon, such as breastfeeding, may be impacted by the change in the initial expectations known as maturation bias (139).

Although some women perceive the idea or the process of breastfeeding negatively as a whole (79), negative aspects of the breastfeeding experience are typically related to lactation difficulties, uncertainty about milk supply, pain, time demands (133), as well as the lack of control over the lactating body and desire to 'get the body back' (79). In a Canadian qualitative study, mothers who described their experiences as negative often continued to breastfeed to prioritize infant health benefits (133). Striving to overcome obstacles and achieve successful breastfeeding by foregoing maternal needs may lead to feelings of distress and anxiety (134). The phenomenon of perseverance with breastfeeding despite lactation difficulties has been linked to the conceptualization of breastfeeding as an obligatory component of 'good motherhood' (79) (see Section 3.2).

3.5.2. Experience of expressing and feeding expressed human milk

While there is little research in this area, there is some evidence that expressing and bottle-feeding human milk elicit different feelings than breastfeeding (10,14,137). Mothers describe both positive and negative feelings about various aspects of human milk expression that are unique to this practice (70,140). Perceived benefits include sharing the responsibility of feeding and allowing other caregivers to 'bond' with the infant (68), avoiding exposing breasts in public (68), managing pain and anxiety associated with breastfeeding (68), and increasing or controlling milk supply (67,71,140). Moreover, human milk expression can be constructed as a way of negotiating more independence and freedom while keeping balance between motherhood and other aspects of mothers lives (14,67,68,89). With respect to negative experiences, these include pain, concerns around low milk volume (as women are able to see and measure it) (140), as well as time demands and the inconvenience of human milk expression (14,89,140). Mothers have also indicated confusion due to the conflicting information available around human milk expression and frustration with the lack of consistent advice from healthcare professionals on the topic (61,140,141).

It is important to note that the experience of human milk expression is dependent on the reasons for expression, as well as the physical space where mothers express milk (14,89). Mothers who express human milk due to return to employment often experience negative feelings related to the lack of choice or control (89). Moreover, mothers who express their milk at workplaces that lack appropriate lactation spaces often have to resort to expressing in bathrooms or storage closets, leading to feelings of embarrassment and isolation, as well as concerns around potential contamination of the expressed milk (14). In contrast, mothers who express with an intention to get time away from the infant or engage in social activities view human milk expression more positively (89).

In regard to the experience of feeding expressed human milk, mothers typically prefer feeding at the breast, leaving bottle-feeding to other caregivers with an intention of 'bonding' (see Section 3.3.2) or after returning to work (10). Women may resort to feeding expressed milk themselves when breastfeeding is unsuccessful or painful due to lactation difficulties (10). Perceptions of feeding expressed human milk differ, with mothers reporting both positive and negative attitudes to certain aspects of this practice (10). For instance, sharing the responsibilities of infant feeding may be perceived both positively as a way of negotiating free time and

facilitating ‘bonding’ with other caregivers, as well as negatively due to the loss of control over established infant feeding practices (10). Moreover, mothers commonly describe the frustration with the number of steps needed to prepare expressed human milk for feeding (10).

3.5.3. Guilt and shame

Although maternal experiences differ among those feeding expressed human milk compared to mothers who only feed at the breast (10,14,137), both feeding methods have been linked to feelings of shame and guilt (137,142). No matter the feeding method, women are often faced with moral implications of both their intentions and actions, as well as both internal and external pressures and judgement (41,143).

Shame is often used interchangeably with guilt but there is a need to distinguish these two emotions (47,142). Guilt is an emotion of remorse or regret in a response to actions or circumstances beyond one’s true control and therefore, it does not involve self-condolement (144). Shame, on the other hand, is an internalized global negative emotion that is constructed through the difference between the ideal and the actual self (e.g., feelings of being ‘not good enough’), often in response to not reaching a goal (144). Beyond internalization, another important difference between guilt and shame is the involvement of the whole self in the latter that contributes to much higher potency and damaging potential of the latter emotion (142,144).

Importantly, negative emotions around feeding experiences are constructed differently in case of breastfeeding and bottle-feeding mothers (142). Taylor and Wallace argue that bottle-feeding mothers experience shame through ‘failure’ to reach the idealized notions of ‘good’ motherhood and womanhood (142), leading to mothers hiding their intentions to formula-feed or the fact that they are bottle-feeding from others, including health professionals (42,79,137). Moreover, when infant feeding method differs from the one intended, this discrepancy may lead to feelings of inadequacy, inferiority, and incompetence, internalized as shame (134,137). Breastfeeding women, on the other hand, may experience shame while feeding at the breast in public through the violation of modesty expected from them as ‘asexual’ and ‘innocent’ beings (68,142,145), as well as through the violation of the expectation of ‘good motherhood’ marked by confidence in case of lactation difficulties (91,145).

Canadian mothers who stopped feeding human milk earlier than initially planned described strong feelings of regret and guilt, even in cases where their breastfeeding experience was overall

negative or ceasing was related to physical difficulties (133). Mothers have also identified significant pressure to breastfeed and described that lactation difficulties led to feelings of inadequacy and self-blame due to the failure to achieve the idealized notion of 'good motherhood' (79,134,137). Importantly, judgement and blame for stopping feeding human milk earlier than prescribed or choosing to use infant formula are not only internalized, but also expressed by mothers to other mothers, especially if perceived that another mother failed to put enough effort to breastfeed (42). Overall, negative feelings related to not achieving initial lactation goals are often linked to the perceived level of commitment and persistence put into breastfeeding (79). Furthermore, positivist public health breastfeeding promotion (i.e., breastfeeding imperative) and practices of health professionals advocating for breastfeeding have been also linked to maternal guilt (47,137,142,146).

Although comparatively less is known about the emotional responses of mothers who bottle-feed expressed human milk, they also often report feelings of failure, specifically related to the perceived inadequacy of the amount of milk retrieved by expressing (10). Moreover, mothers who express human milk also described feeling guilty when leaving their infant to participate in social activities, despite the strong desire to do so due to the perceived preference of infant for the breast or potentially inferior feeding practices of other caregivers (10,89).

Although the experience of feeding human milk is mostly regarded as positive overall (133,136,139), pressure to breastfeed, as well as the dominant discourses of breastfeeding being 'natural' and compulsory for 'good motherhood' despite any obstacles are internalized by women, leaving them with feelings of shame, guilt, self-blame, and failure if the idealized expectations and the reality of breastfeeding experience do not align (79,146).

3.5.4. Feeding human milk in public

Feeding human milk in public is a prominent issue from both public health and feminist perspectives (40). Negative experiences related to breastfeeding in public have been identified as a significant barrier to successful breastfeeding (40) and a reason for early breastfeeding cessation (147). On the other hand, positive experiences of seeing other women breastfeed in person is associated with higher likelihood of intending to breastfeed (148), which, in turn, may impact initiation and duration of human milk feeding (5,99,149). Moreover, a survey conducted

in Toronto showed that mothers who felt comfortable breastfeeding in public were 2.9 times more likely to continue feeding human milk to six months (n=892) (150).

Feeding human milk has been widely described as a predicament where both breastfeeding and bottle-feeding in public are associated with fear, shame, guilt and other powerful negative emotions (137,142). While some women resort to bottle-feeding in order to alleviate the discomfort and undesired attention related to breastfeeding in public (10,67,68,79,145), others experience public disapproval, blame, and stigmatization while bottle-feeding in public (42,137).

In Canada, breastfeeding in public spaces is a protected right (151). A 2008-2009 Toronto-based survey (n=1453) found that 69% of mothers who fed human milk did breastfeed in public (150). Overall, breastfeeding in public is generally supported by Canadians, with the majority of respondents of the survey conducted in Ottawa in 2015 agreeing that breastfeeding was 'acceptable' at a restaurant and in the shopping mall, with 78% and 81% acceptance, respectively (152). On the other hand, the results of the qualitative study conducted in Nova Scotia and New Brunswick showed that support of breastfeeding in public is not universal, with 31 out of 47 participants reporting that breastfeeding is acceptable only if 'discreet' or performed in private areas of the public space (e.g., washrooms) (153).

Breastfeeding is a unique phenomenon as it represents both the moral high ground of 'good motherhood' and indecency at the same time (68). It is also influenced by the construction of the 'good maternal body' that is represented by archetypal 'innocent' Madonna (68). Women's work traditionally associated with the private sphere thus deemed inappropriate in public which represents the legacy of exclusion of uniquely female activities from the public sphere suited to only accommodate male bodies (6,38,54). This phenomenon has also been linked to the objectification of female bodies and particular sexualization of breasts in western societies under heteropatriarchy (6,68,91,137,145). It influenced the formation of a double-standard to body politics that allows for drawing attention to culturally desirable 'intact' breasts that are seen as sex objects in advertisements, on television and in magazines, but treats breastfeeding in public as 'indecent' (6,68,154). Both heteropatriarchy that views breasts as sex objects and contemporary commodification of feeding human milk disembody women by denying them the embodied experience of their breasts (154,155) and dictating the conditions for inclusion of breastfeeding women in the public sphere (38,54).

These ideological influences and lack of community support impact experiences of breastfeeding women who avoid breastfeeding in public or experience negative reactions when doing so (79,137,145). Breastfeeding in public is not a social norm in HICs (137,145) but rather an act that may be constructed as potentially problematic, which therefore, needs to be negotiated with others and performed in a certain way in order to be 'acceptable' (68,91,137,156). According to Leeming and co-authors, socially acceptable breastfeeding follows a particular 'etiquette' marked with both discreetness and confidence as these aspects fulfill the requirements of modesty and 'good motherhood' (91). Socially acceptable breastfeeding is deemed 'discreet' if the nipple is concealed and all signs of milk production are hidden as human milk may be perceived as both pure or nurturing and as a 'dirty' bodily fluid (91,145,156). The breastfeeding woman is also required to be particularly confident in public in order to avoid raising any concerns about infant's well-being and thus, her motherhood (91,145).

Women often associate breastfeeding in public with feelings of embarrassment and discomfort that can be experienced by the breastfeeding mothers themselves or perceived to be experienced by other people (79,91,145). Mothers experience disapproval of breastfeeding in public that can be expressed by others both verbally or non-verbally (e.g., looks, facial expressions) (40,145). Women also report the differences in the expected or experienced reactions depending on the context and people that are around, specifically avoiding breastfeeding around males, including family members (e.g., father-in-law) and partner's friends (79), as well as male partners themselves (137). Moreover, the age of the child may influence the experience of breastfeeding in public, as feeding a toddler at the breast is often perceived as more problematic compared to an infant (137,145).

Importantly, individual breastfeeding experiences can also impact the decision to avoid breastfeeding in public, with women experiencing lactation difficulties postponing breastfeeding in public by staying at home (6) or resorting to bottle-feeding in public due to inability to breastfeed 'discreetly' if they needed to use nipple shields or change positions more frequently (67). Moreover, mothers who experience lactation difficulties report feelings of failure, inadequacy and shame that are exacerbated by the concerns around the judgement from other people in case of breastfeeding in public, as struggling mothers may be perceived deficient both as mothers and as women (67,91,137,142).

The topic of infant feeding in public is dominated with the discussion around breastfeeding while the experiences of women who bottle-feed in public are much less prominent in the literature (118). Mothers who bottle-feed in public report receiving disapproving looks, being questioned by others (including other mothers) about their feeding method, and feeling fearful to discuss bottle-feeding with healthcare professionals (42,47,137). Moreover, some bottle-feeding mothers avoid feeding in public as it may exacerbate feelings of failure and inadequacy linked to the social construction of ‘good motherhood’ (42,137).

4. Research gap and significance

Human milk is the recommended infant food (1,2), but the experience of feeding human milk is a complex phenomenon that occurs in the contexts of women's lives (4,5). The dominant discourse of feeding human milk is rooted in a positivist paradigm that prioritizes the biomedical benefits of human milk feeding, often ignoring the sociocultural, relational, psychological, economic, and political aspects of the multifaceted phenomenon of feeding human milk (4–6). This paradigm coalesces with neoliberal ideology that constructs health as a matter of personal responsibility, and in this case, focuses on feeding human milk as an obligatory health practice and thus, an essential element of 'good motherhood' (49–51). Moreover, the reductionist focus of public health promotion on human milk as a superior product to its substitutes, practically equates feeding at the breast with bottle-feeding expressed human milk despite known differences between the two feeding modalities in relation to infant health outcomes (9,12) and maternal experiences (10,14).

Despite the widespread prevalence of human milk expression and bottle-feeding human milk in HICs, research that explores women's experiences of managing multiple feeding modalities is scarce. There is an urgent need for a better understanding of motivations, practices and experiences of women who feed human milk via bottles along with breastfeeding (9). Moreover, the research on human milk feeding experiences is limited overall, despite the repeatedly identified need for a deeper appreciation of the complexity of this phenomenon with a goal of providing better support for lactating mothers (9,133). This research used an interpretive phenomenological approach and drew on a theoretical toolkit comprising the elements of feminist new materialism (17), intersectionality (18), and critical health studies (19–21) to explore the experiences of Nova Scotian mothers who concurrently practice dual modality feeding over the first five months postpartum.

5. Research objective

The objective of my research was to explore the practices and lived experiences of Nova Scotian mothers who both feed human milk directly at the breast and express human milk to feed by bottle in private and public spaces over first five months postpartum.

6. Theory and methodology

6.1. Theoretical framework

The theoretical framework consists of a toolkit of theoretical concepts that I used to guide the research process (157). Assembling a theoretical toolkit enabled me to tailor and enhance the applicability of the theories to this research (157). For this inquiry, I used a theoretical toolkit comprising elements of feminist new materialism (17), intersectionality (18), and critical health studies (19–21).

Feminist new materialism

Infant feeding, whether by bottle or breast, is a material biological function the understanding of which is inseparable from its social and cultural meaning. Infant feeding is also a recognized feminist issue (6,38). Feminist new materialism emphasizes the inextricability of the material/natural and social/cultural world in seeking to theorize how and why power inequities manifest and are maintained in society. Hence, feminist new materialism was selected as a fitting theoretical framework to guide this research (17). New materialism emerged in response to the predominant focus within feminist thought on the discursive construction of gender and other axes of inequity to the neglect of the material aspects and implications of oppression, namely with respect to the material body (17,158,159). New materialism urges researchers to attend to the interplay among material and socio-cultural aspects of the phenomenon, instead of reducing the analysis to either biomedical (i.e., material) or poststructural (i.e., discursive) framings (158,159). In this framework, culture and nature are not opposed to each other, but rather engage in constant mutual inter-implication (17,158–161). New materialism breaks through the reductionist dualism of culture versus nature (158,159) by theorizing that knowledge is constructed by the matter, but understood through the discourse (159). Material feminists explore various phenomena as complex interactions between biology, technology, culture, history, discourse, and social power relations without privileging any one of the dimensions (17,160,161). As theorized by Karen Barad, these elements are in constant interplay with one another and constitute entangled material-discursive forces that account for the materialization of all bodies (162). Moreover, feminist new materialists assert that meaning is produced relationally, within and between the phenomena through “intra-actions” (162).

Therefore, a phenomenon cannot be meaningfully understood from any single perspective or outside of the material-socio-cultural context from which it emerges and is experienced (17).

It is well-recognized in feminist literature that feeding human milk represents both biological and cultural aspects of motherhood (6,163). New materialism has been previously used as a theoretical approach to analyzing various experiences of motherhood as embodied social practices, including feeding human milk (45,46,164). My understanding of feeding of human milk as an interplay among natural/material and socio-cultural contextual forces, which is informed by feminist new materialism, meant that my research comprises an exploration of the biological and discursive aspects of mothers' experiences of dual modality feeding, while allowing for diversity, nonlinearity, and fluidity of knowledge that is both embodied and socially constructed (158,159). Adopting feminist new materialism as the theoretical framework that guides this study allowed me to explore sociocultural aspects of the experience of feeding human milk without dismissing biological materiality of this phenomenon (164).

Intersectionality

In addition to feminist new materialism (17), my theoretical framework included intersectionality (18), and concepts drawn from critical health studies (19–21). I use these concepts to emphasize that the experience of feeding human milk is not solely a gender issue, but a social phenomenon that is influenced by the intersectional positionality of mothers in the context of contemporary western society. Intersectionality was originally developed by Kimberlé Crenshaw to conceptualize how the various axes of oppression do not simply co-exist, but amplify and shape the texture of each other in the context of the lived experiences of Black women (18). Intersectionality has been widely recognized and used in a variety of academic disciplines, as well as political and social movements (165). I agree with Cho, Crenshaw, & McCall in their view of intersectionality as a dynamic and inherently political concept that is most significantly concerned with power and social change, rather than the relative importance of various identity categories (165).

Thus, for the purposes of this inquiry, data collection and analysis were informed by intersectionality (18). Specifically, I utilized relational intersectionality, a concept typically used in therapy to emphasize how the intersectional positionalities of both a client and a therapist construct unique power dynamics of each therapeutic relationship (166,167). Relational

intersectionality is particularly useful in elucidating the ways that power is distributed, not solely based on the nature of the therapeutic encounter (where the therapist is always seen in the position of power), but rather influenced by the multiple identities of the client and therapist that are located on numerous axes of power in relation to each other (167).

Tang applied the relational lens to the dynamics of feminist interviews by comparing her experiences of interviewing mothers in academia in China and the UK (168). Tang explains that despite her being an academic and a mother herself (i.e., an 'insider' to the group of academic mothers), her experiences of interviewing those being regarded as 'peers' on the surface level differed based on the sociocultural context and her positioning relative to each of the interviewees (168). I considered the power interplay of the intersectional identities during data collection through feminist interviewing, as well as during my analysis of the meaning of the experiences offered by the participants (see Section 6.2). In order to make this process meaningful and transparent, I reflected on my own identity, with a specific emphasis put on the categories that are of particular importance for research in this area (see Section 6.2.1).

Critical health studies

I have also used concepts drawn from critical health studies (19–21) to situate mothers' experiences in the ideological context of contemporary society. Moreover, these concepts fulfill the political aims of feminist research, and emphasize my understanding of intersectionality as an emancipatory project rather than a tool that may perpetuate neoliberal imperatives (165). Critical theory is a school of interdisciplinary thought that encompasses multiple theories and ideas (157,169). For the purposes of this inquiry, I utilized critical theory to contextualize mothers' experiences and to critique the predominant, but also limited, positivistic views of feeding human milk. Therefore, I explored how the experiences described by mothers are influenced by the interlinked theoretical concepts of neoliberalism (170), healthism (52), and medicalization (21).

Neoliberalism is an ideology that is based on a set of distinct ideas that constitute a particular worldview (170). These ideas include a focus on the individual and freedom of 'choice' above the community or society (i.e., individualism), as well as concern with free-market security and minimal government involvement (i.e., capitalism) (170). In critical theory, ideology is not simply a set of ideas, but a system of thought that permeates all aspects of the

society and justifies the creation of policies, structures and systems that people keep unknowingly subjugated (169). Under neoliberalism, the issues of health, food, sexuality, and the body are presented as 'lifestyle choices,' leading to the erosion of public policies and social safety nets in these areas (170). Thus, health is seen through a prism that emphasizes individual responsibility for one's health and denies the impact of inequalities that are exacerbated under neoliberalism (52). Neoliberal understanding of health fosters the environment that fails to recognize the well-established impact of social determinants of health (e.g., race, gender, income, food security, education etc.) (27). Instead, the individuals are pushed into the pursuit of health as a personal responsibility that is closely linked to 'good citizenship' in the context of the 'risk society' (i.e., healthism) (53). Moreover, capitalistic and neoliberal understanding of health fosters medicalization of various embodied phenomena (21), including feeding human milk (20,67). First developed in the 1970s, medicalization refers to a classification of bodily experiences or characteristics as medical issues in need of management and treatment (21). The impact of these notions on the contemporary discourses around motherhood (171,172) and specifically, feeding human milk has been widely explored in the feminist literature (20,42,49,67,171,173).

6.2. Research methodology

Due to the positioning of feeding human milk as both a biologic process and a sociocultural phenomenon, this qualitative research study uses an interpretive phenomenological approach (IPA) (16). Interpretive phenomenology has been widely used for in-depth analysis of lived experiences of individuals in a variety of fields, most prominently, health psychology (174).

From a theoretical standpoint, a feminist application of Merleau-Ponty's phenomenology shares new materialist goals to overcome the dualism of nature versus culture (175–177). Bigwood applies Merleau-Ponty's phenomenology in the context of pregnancy, arguing that it allows a 'renaturalization' of the mothering body and understand the experiences of motherhood as both embodied and contextualized (culturally and historically) (177). Moreover, Spencer argues that feminist-informed IPA based on Merleau-Ponty's phenomenology is the most appropriate method for in-depth analysis of a complex phenomenon of breastfeeding experience specifically (176).

IPA allows researchers to uncover mothers' experiences within the specific contexts of their lives, offering a possibility for an understanding of the intricacies of the experience in relation to external and internal influences (176). Moreover, IPA is appropriate for the analysis of the motivations and reasons behind individual's actions within the social and cultural contexts of their lives (176). Through IPA, researchers engage in double interpretation by first offering a space for participants to make meaning of their experiences and then decoding this meaning with a consideration of the larger contexts (174). IPA researchers attempt to understand the events from the participant's perspective to the fullest extent possible, although acknowledging that it is never fully attainable (174). The second interpretation of the meaning-making articulated by the participant allows for a rich and comprehensive analysis of the individual's experience in their unique circumstances within the context of the society (174,175). As described above, my analysis of the individual and social contexts was informed by intersectionality and critical theory. Thus, IPA allowed me to uncover, describe, and contextualize lived experiences to develop a deeper understanding of a complex phenomenon, such as feeding human milk (41).

6.2.1. Researcher's positionality

Considering that the data for this project was collected and analyzed using methods that require critical reflexivity (178,179), it is paramount for me as a researcher to reflect on my own intersectional positionality as it applies to this inquiry. Moreover, it is of particular importance to consider my positionality in the context of the multidimensional category of insider/outsider as it can influence power dynamics and the qualitative research process as a whole (180). I also believe that it is crucial to disclose my context as it may impact my interpretation of the meaning-making of participants' contexts in the course of IPA (174).

I acknowledge that I hold a lot of privilege by being a white, middle-class, able-bodied, highly educated cis-woman. I also experience oppression based on my status of a newcomer to Canada and a non-native English speaker in the anglophone province of Nova Scotia. In regard to the insider/outsider categorization, most importantly, I do not have any personal experience of either breastfeeding or bottle-feeding expressed human milk. This short set of characteristics is not meant to be comprehensive or exhaustive. Considering the recommendations for both IPA (175) and feminist interviewing (179), I engaged in critical reflexivity throughout the research

process. I kept a reflexive journal (175), parts of which I share throughout my thesis where appropriate.

6.3. Research methods

6.3.1. Recruitment and sampling

I recruited participants using posters *(see Appendix A)* that were displayed in various public spaces (e.g., MSVU campus, public libraries, community centres) and on pertinent social media pages (e.g., Breastfeeding Community of Practice, Maritime Moms). Interested mothers contacted the research team via email. Eligible mothers were invited to participate in a one-on-one interview (in person or over the phone) at two timepoints, between 6-8 weeks, and 20-22 weeks postpartum *(see Appendix B for the interview guide).*

The following eligibility criteria were used to define the sample included in this research. Mothers were eligible to participate if they:

- were 19 years of age or older,
- lived in Nova Scotia,
- had a healthy singleton baby who was younger than 8 weeks of age, and who was fed mother's milk directly from the breast and from a bottle,
- planned to exclusively feed mother's milk up to 6 months.

Mothers were not eligible to participate if:

- the baby was born preterm (earlier than 37 weeks gestation),
- mothers planned to move out of Nova Scotia during the first 6 months postpartum.

6.3.2. Data collection

All study participants (N=10) completed two interviews (n=20) as well as a demographic questionnaire that was completed in-person or submitted via email prior to the interviews *(see Appendix C)*. Data were collected between November 2019 and February 2021. Interviews ranged in length from 35 minutes to 2 hours and 38 minutes. Most of the interviews (n=16) were conducted remotely due to the restrictions on social interactions placed by the Government of Nova Scotia due to COVID-19 pandemic (181).

In line with the interpretative phenomenological approach used for this research, I collected data using semi-structured one-on-one interviews (174,182). Considering the area of

research and the theoretical framework described above, I conducted the interviews using a feminist approach (179). Feminist interviewing is a relational practice (183) marked by specific attention to the power dynamics between the multidimensional and fluid positionalities of the participant and the researcher (168,179). Moreover, feminist interviewing directs attention to gaps, silences, and omissions in participants' experiences, although these aspects of the interview should be interpreted with extreme caution due to a complex interplay of intersectional positionalities of the participants and the researcher (179). Feminist interviewing also emphasizes the use of various interviewing techniques including reflexive self-awareness, active listening, and a critical approach to the information provided by the interviewees (179). When done correctly, feminist interviewing has transformative power and can produce in-depth knowledge to answer complex questions while acknowledging the heterogeneity of women's experiences (179). Furthermore, the specific attention to fluid power and multidimensional dynamics of feminist interviews coincides well with the theoretical framework that is rooted in critical theory including intersectionality and concepts from critical health studies.

6.3.3. Data analysis

Data analysis was done iteratively with data collection. Considering the recommendations of IPA studies, and the limitations of one Master's thesis, I planned, and was successful in recruiting 10 participants (174). I transcribed qualitative data from interviews verbatim and thematically analyzed (175) the data in MAXQDA using inductive and deductive coding. I employed thematic analysis with inductive, open coding to allow patterns, codes, and categories to emerge from the data (175,184). Following open coding, I used phenomenological line-by-line coding with a focus on experiences and meanings to identify codes and emergent themes (175). Subsequently, I created a cross-case thematic network by clustering themes and exploring the relationships between the themes that emerged in different interviews (174,184). Following the creation of the thematic network, I interpreted the themes using the theoretical framework devised for this study to situate the findings in the context of the existing literature (174).

6.3.4. Ethical considerations

This study was conducted as part of a larger research study titled Responsive Feeding of Infants with Expressed Milk (REFINE): The experiences of caregivers breast- and bottle-feeding

of human milk. The REFINE study was funded by Research Nova Scotia and received ethical clearance from the MSVU Research Ethics Board (2020-009; *see Appendix D*) and the University of Prince Edward Island Research Ethics Board (6008074; *see Appendix E*).

Prior to the interviews, all participants were presented with a consent form (*see Appendix F*) that outlined risks and benefits associated with participation in the study. Participants were given an opportunity to ask any questions prior to signing the form. Moreover, participants were able to stop participating or withdraw from the study at any point without consequences or a need to explain their decision. During the interview, participants were able to skip any questions, stop the recording, or withdraw at any time. Participants were reminded of these options prior to both interviews.

Confidentiality of the participants was ensured by stripping the interview transcripts of any identifying information during transcription. Pseudonyms were assigned at the time of transcription; these were not derived from participant's names or any other personal identifiers. Pseudonyms are associated with the subject codes of the REFINE study and a document linking the codes to participant's names is kept on a password-protected computer in a secure area in the office at the MAMA Lab at MSVU. All other electronic data files (e.g., interview transcripts) are stored on password-protected computers and/or secure servers accessible only to members of the research team. Archived electronic data files and any hard copies of data, consent forms or other papers containing data are stored in locked filing cabinets in locked research offices at the MAMA Lab.

7. Results and discussion

In this chapter, I share the results of my thematic analysis. In line with IPA, I emphasize participants' meaning making of their experiences. While employing feminist interviewing, I carefully consider the complex interplay between intersectional positionalities in each of the interviews for my analysis. Moreover, the use of feminist new materialism allows me to consider both embodied (material) and social (discursive) aspects of mothers' experiences.

In the first section, I describe the mothers who participated in the study both as a group and as individuals. In the next section, I present a theoretical model that I developed to conceptualize how mothers use dual modality feeding as a strategy to navigate the complex tensions that exist among their multiple embodied identities. I describe each of the constructs of the model in detail and explain the process of navigating tensions via dual modality feeding based on participants' experiences. In the last two sections, I describe practical aspects of dual modality feeding and offer suggestions for the improvement of supports provided to dual modality feeding families.

7.1. Participants

A total of 10 mothers participated in the study. Mothers were an average of 31.8 (± 5.0) years old, 7 were white, and 8 were multiparous. Average annual household income was CAD 69,000 (± 26,153) and 7 mothers were on paid maternity leave. Study participants varied in predominant feeding strategy and previous feeding experience (see **Table 1**). At 8 weeks postpartum, all mothers in this study fed at the breast and expressed milk for bottle-feeding, which may have been done by the mothers themselves or by other caregivers. Most of the mothers fed predominantly at the breast both at 8 and 22 weeks postpartum, while predominant bottle-feeding was typically associated with return to employment or lactation challenges. A biosketch with the detailed characteristics of each of the participants can be found in **Table 2**.

Table 1. Demographic characteristics of study participants.

Characteristic	Participants (n)
Age at 8 weeks postpartum (years)	
< 25	1
25 – 30	3
30 - 35	4
> 35	2
Ethnicity (mother)	
White	7
First Nations/white	1
Black	1
Latin American	1
Ethnicity (baby)	
White	5
First Nations/white	1
Black/white	1
Latin American/white	2
Other mixed identity	1
Marital status	
Married	8
Common-law	2
Education	
High school diploma	2
College degree	1
Undergraduate degree	6
Graduate degree	1
Parity	
Multiparous	8
Annual household income (CAD)	
< $40,000	1
$40,000 – $59,999	3
$60,000 - $79,999	3
$80,000 - $99,999	2
> $100,000	1
Return to employment at 8 weeks postpartum	
No	8
Part-time	1
Full-time	1
Return to employment at 22 weeks postpartum	
No	7
Part-time	1
Full-time	2
Predominant feeding strategy at 8 weeks postpartum	
Feeding at the breast	8
Bottle-feeding expressed milk	1

Equal breastfeeding and bottle-feeding expressed milk	1
Predominant feeding strategy at 22 weeks postpartum	
Feeding at the breast	6
Bottle-feeding expressed milk	2
Equal breastfeeding and bottle-feeding expressed milk	1
Formula-feeding	1
Prior experience of feeding human milk	
None	2
< 6 months	1
6 months – 12 months	2
> 12 months	5
Prior experience of formula-feeding	
Yes	4
Mother breastfed herself as a baby	
Yes	4

Table 2. Biosketch of study participants.

Pseudonym	Bio
Emma	31-year-old second-time white mother of a baby of mixed identity. Married, has an undergraduate degree, small business owner, returned to work full-time by 8 weeks postpartum. Total annual household income between $50,000 and $59,999. Fed equally at the breast and with the bottle. Previous experience of feeding human milk for < 6 months; some previous formula-feeding experience. Not breastfed herself as a baby.
Nora	38-year-old second-time white mother of a white baby. Married, has a college degree, self-employed as an aesthetician, returned to work part-time by 8 weeks. Total annual household income between $30,000 and $39,999. Primarily fed at the breast. Previous experience of feeding human milk for > 12 months; no previous formula-feeding experience. Breastfed herself as a baby.
Tasha	34-year-old fifth-time white mother of a white baby. Married, has an undergraduate degree, stay-at-home mom. Total annual household income between $50,000 and $59,999. Primarily fed at the breast. Previous experience of feeding human milk for > 12 months; some previous formula-feeding experience. Breastfed herself as a baby.
Maria	28-year-old second-time Latin American mother of a baby of mixed identity (Latin American/white). In a common-law partnership, has a high school diploma, stay-at-home mom. Total annual household income between $50,000 and $59,999. Primarily fed at the breast. Previous experience of feeding human milk for < 12 months; no previous formula-feeding experience. Breastfed herself as a baby.

Hannah	35-year-old second-time white mother of a white baby. Married, has a graduate degree, employed as a lawyer, on maternity leave for 12 months. Total annual household income between $90,000 and $99,999. Primarily fed at the breast. Previous experience of feeding human milk for > 12 months; some previous formula-feeding experience. Not breastfed herself as a baby.
Daria	27-year-old second-time white Russian immigrant mother of a white baby. Married, has an undergraduate degree, employed as a cook, returned to work full-time by 16 weeks. Total annual household income between $40,000 and $49,999. Primarily fed at the breast by 8 weeks, fed equally at the breast and with the bottle by 22 weeks. Previous experience of feeding human milk for > 12 months; no previous formula-feeding experience. Not breastfed herself as a baby.
Renée	34-year-old first-time white mother of a white baby. Married, has an undergraduate degree, employed as a case worker, on maternity leave for 12 months. Total annual household income between $90,000 and $99,999. Primarily fed at the breast by 8 weeks, predominately formula-fed by 22 weeks. No previous experience of either feeding human milk or formula-feeding. Breastfed herself as a baby.
Kimberly	39-year-old second-time white mother of a baby of mixed identity (Latin American/white). Married, has an undergraduate degree, employed as a dietitian, on maternity leave for 18 months. Total annual household income between $100,000 and $149,999. Primarily fed at the breast. Previous experience of feeding human milk for > 12 months; no previous formula-feeding experience. Not breastfed herself as a baby.
Julia	29-year-old second-time mother of mixed identity (First Nations/white) of a baby of mixed identity (First Nations/white). In a common-law partnership, has a high school diploma, employed as a retail manager, on maternity leave for 12 months. Total annual household income between $60,000 and $69,999. Primarily fed at the breast. Previous experience of human milk for > 12 months, some previous formula-feeding experience. Not breastfed herself as a baby.
Fernanda	23-year-old first-time Black Caribbean immigrant mother of a baby of mixed identity (Black/white). Married, has an undergraduate degree, stay-at-home mom. Total annual household income between $60,000 and $69,999. Primarily bottle-fed human milk. No previous experience of either feeding human milk or formula-feeding. Breastfed herself as a baby.

7.2. The Tri-Self: A theoretical model of women's experiences of dual modality feeding

Based on the experiences shared by the mothers who participated in this study, dual modality feeding can be theorized as a strategy for negotiating social, cultural, and embodied tensions via which women are re-establishing their identities as mothers, as women, and as individuals outside of their maternal and womanly roles. An illustration of the connection of feeding human milk and motherhood was shared by Tasha, a mother of five:

I'd say that [breastfeeding] definitely has made my overall experience of motherhood positive. Like, ... it's just [a] part of who we are ... It feels good to give them that and it make[s] me take pride in my mothering that, like, even when things are not going well, I've done this for them. So, ... it's definitely a part of my overall mother[hood] experience. It's definitely a positive part of it.

In broad strokes, the theoretical model presented here centers on the Tri-Self, a construct that comprises three embodied identities — Motherself, Womanself, and Otherself — among which mothers negotiate tensions via practices of dual modality feeding (see **Figure 1**). Dual modality feeding is a strategy by which women satisfice the competing demands, needs and desires of these embodied identities, as well as the complex expectations, opportunities, and constraints of surrounding social, cultural, and material contextual factors that shape women's experiences as mothers, women, and individuals to find an individually and a situationally acceptable compromise. More specifically, the contextual factors include: 1) the wider cultural meanings and expectations related to infant feeding; 2) the expectations placed on women to appropriately manage their lactating bodies; 3) and the expectations of the non-feeding world (i.e., discourses of the larger society around hard work, participation in social life, active lifestyle etc.) The process of managing tensions is also shaped by relational dynamics within the infant-feeder dyad, their immediate and extended families, and peer groups. Satisficing the competing demands and priorities is achieved through performative actions of dual modality feeding, such as feeding at the breast, expressing human milk, or bottle-feeding. These actions represent temporarily prioritizing and suspending in relation to the competing embodied identities comprised by the Tri-Self.

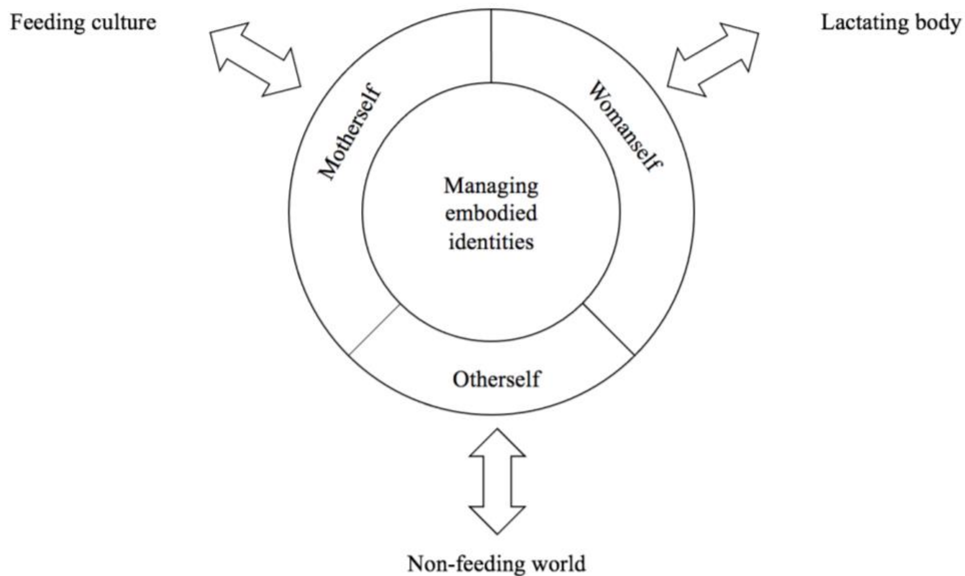

Figure 1. The Tri-Self: A theoretical model of the experience of dual modality feeding.

I constructed this theoretical model based on my understanding of the experiences shared by the study participants and by drawing on insights from the theoretical framework that guides this research and that comprises feminist new materialism (17), intersectionality (18), and key concepts from critical health studies (19–21). With the use of feminist new materialism, I reject the limited understanding of feeding human milk as solely biomedical or social (45,46,164), and offer a model that theorizes dual modality feeding as a contrapuntally embodied, material, social, cultural, and relational process. I acknowledge that self-identity is complex, embodied, fluid, and constantly re-established through everyday practices (161,162). Although I emphasize particular aspects of self that are most relevant to the experiences of the mothers that I interviewed for this work, I recognize that the categories of Motherself, Womanself and Otherself are not mutually exclusive. In the following sections, I discuss each of the aspects of selfhood that I theorize are comprised by the Tri-Self, which conceptualizes my overarching understanding of the essence of women's experiences of dual modality feeding — navigating tensions among competing aspects of their self-identity as mothers, as women, and as individuals.

7.2.1. Managing embodied identities

For the mothers in this study, dual modality feeding is a strategy that enables them to negotiate tensions among competing embodied identities in ways that satisfice specific circumstances at any given time. The decisions made by mothers about how, when, where, and why to breast- or bottle-feed represent the momentary prioritization of the various needs and desires of their competing embodied identities, as well as the expectations, constraints, and opportunities placed upon them by the surrounding social, material, cultural, economic, and relational milieu. I emphasize the embodied nature of the identities of the Tri-Self, as well as the physical demands of managing the lactating body, as well as the equipment (i.e., breast pumps, nursing wear, bottles) and material substances (i.e., breast milk) of dual modality feeding.

In this theoretical model, the mother sits at the centre of the processes of managing tensions that are borne down upon by competing contextual factors. For the mothers in this study, feeding is one part of managing the experience of constantly being pulled in different directions by the wants and needs of those around her, as well as the broader context of her and her family's life. For instance, in speaking about her frustrations of balancing competing priorities of motherhood, Nora, a second-time mother, stated:

> *Like, probably more just overall [demands]. So, maybe not even just with breastfeeding. Just general, like, you're a mom and you're always wanted by somebody for something (laughs).*

Managing the array of demands placed on mothers by those around them, the social and cultural expectations of motherhood, and their own needs and desires meant at different moments and in various situations prioritizing the different embodied identities comprised by the Tri-Self. The configurations that satisficed these competing demands varied among mothers creating a unique temporary embodied identity and experience for all mothers that was influenced by their values, intersectional positionality, previous experiences, and numerous external factors. Each configuration of the Tri-Self is a temporary balance between the three aspects that is formed by the actions of the mother at a particular point in time. Hence, the process of satisficing embodied identities is constant. None of the dual modality feeding mothers stay in one of the configurations indefinitely. Instead, each of the mothers tends to get into one of the

configurations more or less often depending on internal factors, such as values and beliefs, as well as external circumstances, such as their financial situation and support system.

7.2.2. Motherself in the feeding culture

Motherself

Based on the findings of this study, there is strong evidence that the Motherself identity is something to which the women who participated in this research aspired to in describing the meaning that the experience of infant feeding held for them. Motherself was typically prioritized out of the identities of the Tri-Self, and especially emphasized through feeding at the breast.

The concept of Motherself was first introduced by Kathryn Rabuzzi as a psychological and spiritual state in which self-fulfilment is achieved through the celebration of motherhood (186). In this view, mothers are worshiped as goddesses fulfilling their ultimate destiny and purpose (186). This thinking is similar to the ideas of cultural feminism where breastfeeding is seen as a radical form of embodied subjectivity only available to women who are mothers as opposed to other practices open to all people who are caregivers (38). In this view, breastfeeding becomes a political project within a cultural feminist agenda (38). Such idealizations of mothering and breastfeeding oppose medicalization and celebrate breastfeeding as a special embodied practice available only to mothers (38). However, it is also problematic in that this ideal gets formed under the influence of a feeding culture that is permeated with moralistic notions of breastfeeding as a practice required for 'good motherhood' (42,49,57,187).

The ideal 'good mother' is expected to prioritize Motherself as it fits within the dominant ideology of intensive mothering, first conceptualized by Sharon Hays (58). Within this framework, mothers are deemed 'good' only if they are fully absorbed in their maternal roles by providing labour-intensive, emotionally exhaustive, and financially expensive child-centered care (58). Furthermore, childrearing is guided by 'expert' advice aimed to reduce all possible health risks and provide what is considered 'the best start' within the context of a contemporary neoliberal discourse which includes exclusive breastfeeding (49,185). This ideology is problematic because it emphasizes individual responsibility for health and idealizes one particular way of mothering that is typically performed by affluent and partnered women (185). Moreover, it puts tremendous levels of pressure on women and strips away their agency by prescribing exactly how they should behave as mothers to 'do it all' (185). Therefore, mothers

are left with soaring physical and emotional demands, high expectations, risk of judgement, and little support (185). In my model, an example of a woman prioritizing Motherself came from Maria, a second-time Latin American mother, who shared:

> *Oh, well, I wanted to do everything the best that I could for him. So, even when my breast bled out, I was like, "Okay now I can't stop!" I know of so many people stop because it hurts so much but, like … if I have this child and I have milk, I should try to give him milk and work with him through breastfeed[ing].*

Maria's account shows a clear link between the pressure to do "everything the best", breastfeeding and comparison to other mothers' experiences. Motherself is one embodied identity and that is formed under the feeding culture that encompasses various expectations dictated by the society, government, and the medicalization of infant feeding consistent with an ideology of intensive mothering (58). Although a celebration of motherhood can be empowering, the ideology of intensive mothering is oppressive, leading to the internalization of idealized notions and associated feelings of guilt. For example, Julia, a second-time mother of a mixed identity (First Nations/white), shared the following in response to a question about supports:

> *So, [my husband] is more of my support system than anything besides when we go to his mom's house on the weekends—that she is there to help out. But I have, like, a thing when I hand the baby off … it's, sort of, like, a guilt to me that, you know, like, I don't want the image that … other moms get that handing their child off seems like a bad thing … I don't want to just hand her off. … So, … there is my support there but it's not entirely—like, I'd rather ask instead of just doing it. So, I—there is, like, the sense of guilt there. … I feel like because I'm the mom that I, kind of, have to do everything. I know she is a mom too but it's my baby and not hers.*

When asked to elaborate on her feelings of guilt, Julia explained:

> *So, the guilt comes from looking at other things like TV and episodes and looking back early in, like, other eras of time. So, 1920s and all the way so on and looking at other countries and other mothers being strong-willed. And they are able to care for their child without the support of others. Or if their significant other is around that, you know, it's, kind of, solely dependent on [mothers]. So, it—I, kind of, look at it that way that I should be that way too … So, you know, like, having the support system, like, at my mother-in-law's is great but I feel … like I need to take on more of the role without having to ask [for help] or just hand my child off and do that.*

Julia's experience suggests that understanding herself as a mother, and the expectations placed on that role by herself and others around her is influenced by the surrounding social and cultural context, namely ideals of 'good motherhood' that are portrayed in the media. The ideal of 'good motherhood' creates an essentialist understanding of what mothers should and should not be, which is very far from celebratory. Moreover, although this goes beyond the scope of this inquiry, I acknowledge that the idea of celebrating women on the basis of their motherhood is limited and perpetuates the exclusion of people of other gender identities who also partake in maternal practices, including feeding human milk (24,25).

Feeding culture

In my model, Motherself is an aspect of self that represents a path to self-fulfillment through meeting the expectations of the neoliberal ideal of 'good mothering'. This ideal is formed under the larger ideology of intensive mothering that includes a particular feeding culture that constructs breastfeeding as a moral imperative (49,57,58) and human milk as 'liquid gold' (8,20,89), previously described as lactivism (8,188,189) or 'milk pride' (190). Feeding culture is pervasive and omnipresent but also has key dominant attributes depending on where it is encountered by mothers: online, in public, or internally.

Online forums and groups related to feeding human milk have mainly been studied in the context of peer support for breastfeeding while notably fewer studies have looked at online support for expressing and bottle-feeding human milk (191). Online groups can serve as a useful

platform for getting practical advice for mothers experiencing breastfeeding challenges (191,192). For instance, Emma shared:

> *I'm in a lot of parenting groups online and I … if I have basic questions about parenting, I, kind of, throw it out there and between the hundreds and hundreds of parents that are on there, they'll usually come up with an answer … [T]he last one I can remember is I had a lot of breast pain and I thought maybe I had, like, a blocked duct. And I posted online asking, like, how people deal with that. And I got a lot of suggestions like, "You know, use an electric toothbrush! And have a warm bath!" So, you know, it's—they can give you all sorts of recommendations like, "Massage the area. Feed a lot from that one side." And I did all those things and within twenty-four hours it was a lot better.*

After outlining her positive experience with online peer support, Emma provided an important addition that serves as an insight to the online culture:

> *I don't ask a lot because it's, you know, people have opinions and especially, [where] we're in a small area and someone knows who you are then—and I don't want them to draw too many lines to me … So, I'll ask some things but I won't ask other things that I might have questions about. Like, when I was dealing with my anxiety and stuff, it was better for me to go talk to my doctor than to ask online to a bunch of mothers that might be opinionated.*

Although online groups are virtual communities for like-minded people with a shared passion for feeding human milk, these can include individuals from various geographical locations with vastly different experiences (191). Therefore, a culture of the online community may differ from the culture of the place of mothers' residence. As such, Renée, a first-time mother, explained:

> *I'm not exclusively [feeding at the breast] and people are definitely way more judgmental. I belong to groups that are—like, an [regional] group, and a*

Canadian group, and, like, just Babies Born in June 2020. And definitely, from June 2020 [group] which is like all around the world, people are definitely way more outspoken about what's right, and what's not right, and what you should be doing, and shouldn't be doing when people ask questions … I think people probably hold back a bit of their opinions in person versus online they feel like share or say whatever they like. And I think for the most part moms are trying to be helpful but it comes across as judgmental online.

The examples provided by Renée and Emma show two key attributes of the online feeding culture: blatancy, and the strive for perfection. It is clear from their accounts that both mothers utilized the online groups to benefit from advice, while being aware of overt judgement that they may encounter if they diverged from the expectation of the virtual community to always prioritize breastfeeding over maternal mental health or choice to feed using a bottle (i.e., to prioritize Motherself). These findings support concerns of a potential judgement previously described in the literature (191,192).

Another notable aspect of this feeding culture is the focus on human milk as the most valuable feature of dual modality feeding. Mecinska identified this positioning of milk as 'liquid gold' within the online narrative of 'milk pride' (190). These ideas are present in all facets of feeding culture but they are especially prevalent online, in part, due to commercialization of feeding human milk (95). For-profit companies that manufacture pumping equipment utilize the narrative of 'liquid gold' to promote and sell their products by embedding persuasive marketing techniques into online articles that are frequently used by mothers as a source of information about dual modality feeding (94,95).

The positioning of milk as 'liquid gold' is problematic due to fostering of commodification of human milk and disembodiment of women (6,20,42). Moreover, putting value on human milk may lead to intense pressure to save it and subsequent feelings of guilt or fear if any milk is wasted. For example, Daria, a second-time Russian immigrant mother shared:

I'm definitely feeling guilty throwing it out. And probably, like, way more guilty than when [pumping] or when feeding the baby from the bottle. And I—I don't really know why.

Notably, both the mothers who had supply concerns and those who perceived to produce a substantial amount of milk experienced negative feelings when discarding human milk. Therefore, I argue that negative feelings related to the wasting of milk are related to the disempowering narrative of 'liquid gold' that is perpetuated within online feeding culture by peers, as well as companies with clear commercial interest.

When encountered in person, feeding culture presents itself differently from the online culture. As such, issues surrounding breastfeeding in public in HICs is a prominent topic both in the scholarly literature (145), news media (193,194), and social media (195). Even though bottle-feeding in public is much less researched, it is known that both breastfeeding and bottle-feeding mothers have reported intense negative feelings and have encountered disapproving reactions by members of the public (42,137,142). In order to foster 'public comfort' and avoid potential negative reactions from others (196,197), mothers who breastfeed in public feel required to feed in a specific, 'socially acceptable' way (91,156).

In the Nova Scotian context, I describe this phenomenon as a culture of invisibility marked by two key features: an invisibility of the act of breastfeeding, and a set of unspoken rules. Emma's experience at a moms group illustrates this:

> *Also, when I was there I … already wasn't very comfortable with them and she was getting hungry. So, I went to feed her. And all the other mothers there had covers and I don't really use a cover. So, I went to try to feed her and you know, I, [was] kind of … getting looks. So, I took out a blanket and I'm trying to, like, fiddle with this blanket that couldn't be on and, like, have her eating. And it was just—I was getting frustrated. And they're like, "So, you obviously don't care if people see you when you feed her." And I'm like, "No. I'm just feeding her."*

Emma's negative experience at the group was rooted in the fact that she was breaking both invisibility requirements as she was openly feeding at the breast, and also failed to follow the unspoken rules by not having a cover prepared like other moms. Emma's account is one of the very few that included overt verbalization of disapproval. Most of the mothers in the study stated that they were aware of others having similar experiences (either in their friend circle or through

social media) but have never encountered verbal negative reactions themselves. Rather, mothers typically noted an atmosphere of awkwardness and non-verbal or indirect negative reactions. For instance, Julia stated:

> *The looks, the stares. If someone might give you a dirty look ... Teenagers look at you and they, kind of—like, they look at you and give you a weird look or they laugh and then they whisper to each other. It's, kind of, things like that that make you feel uncomfortable but, you know, you can just walk away and all that matters is that you're feeding your baby.*

Notably, a lot of stories shared by the mothers included women (even those who are mothers) and teenagers. This goes against a popular notion that adult males constitute the group especially disapproving of breastfeeding in public (91,156). Although that was true in some cases, these examples underscore that the lack of normalization of breastfeeding is pervasive, contributing to discomfort around public breastfeeding. I see intergenerational learning as an important opportunity for changing the discourse around breastfeeding in public. Importantly, I argue that seeing breastfeeding rather than hearing about it is required for destigmatization to be achieved. For instance, Maria shared:

> *My [older] son at first also was, kind of, weary about me breastfeeding because, you know, he was like, "Boobs, ew! I shouldn't be looking at boobs!" And I was just like, "I'm going to be doing this a lot!" (laughs). "So, you're just going to be desensitized from the boob. Like, it's just boobs. It's going to happen." And then it took him a few days to be, like, okay with it and now he doesn't really care. He's just like, "Ah! There're boobs to eat."*

The same may be achieved through peer-to-peer visibility and learning. Fernanda, a first-time, Black Caribbean immigrant mother, described how that happened to her personally in her country of origin:

I would say definitely what solidified it with me was about three years ago. I stayed with some family friends over the summer and ... her baby at that point I think was three or four months. And she was completely into breastfeeding. And I would say I didn't really think about it before but ... that experience just staying there that summer and watching her take care of her baby and breastfeeding was ... really eye-opening ... And after that experience, I knew that I definitely would [breastfeed] when it was time for me to have a baby.

As for bottle-feeding in public, most of the mothers in the study rarely chose to do it, mainly for reasons of convenience (see Section 7.3.1). In most cases, mothers did not experience any overt negative reactions from others while bottle-feeding. With that, public perception of the contents of the bottle seemed to play an important role. For instance, this was a point of concern for Maria (see Section 7.2.3), as well as a source of the positive public reaction experienced by Julia:

So, on the bus, I had an older gentleman sit beside me and [he] was asking me a bunch of questions about feeding ... So, it was that ... he was telling people on the bus, "Can you believe this is breastmilk in a bottle?" And one lady was like, "Yeah, I can tell. You can tell the colour of it compared to formula." And so, she is like, "I know! I know it's breastmilk! You can tell the colour!" And ... he was just fully astonished. And like, I don't know what it was. His reaction was like, "Oh my God! I can't believe that's breastmilk in a bottle!" (laughs). But—but that was, kind of, like ... highlight of my day was like, well, this—this guy is really intrigued by having breastmilk in a bottle instead of having him latched on me. But that was really it, like, from being outside and someone else's reaction to it and having the bottle.

As can be seen from the examples of public reactions to both breastfeeding and bottle-feeding provided by the mothers, any public infant feeding in Nova Scotia is typically marked by the reaction of surprise. This signifies the expectation of actions representing Motherself to be contained in the private domain as prescribed by heteropatriarchal hegemony (6,154).

In addition to being encountered both online and in person, feeding culture was internalized by mothers in a form of an intense pressure to breastfeed. For instance, Renée described:

> *Where it's so widely known that it [is] so beneficial that, you know, you feel like you need to do it. But I also wanted to do it. I think there is definitely a lot of judgmental people out there for—if you didn't do it. But I don't really—to me, people's opinions aren't really important. So, I'm, kind of, headstrong myself.*

Renée's account shows both the external influences and her internalization of the breastfeeding imperative. The narrative of breastfeeding as ultimately the best option in all circumstances and thus, an essential component of 'good mothering', is described extensively in feminist literature (49,57,58,79). The internalization of these ideas can lead to various consequences, depending on mothers' success with breastfeeding. Mothers who achieve their breastfeeding goals typically describe feelings of pride and accomplishment, especially if substantial barriers were conquered (42,79,133). As such, Tasha shared:

> *I'm proud that I'm able to do that for her as a mom. I guess, … it makes me feel good that I can do that for her … I, kind of, take a little bit of pride in how well she's doing and gaining her weight—growing and all that. So, it's kind of, like, an achievement for me. Even though, maybe it shouldn't be but I, kind of, feel it is (laughs).*

On the flip side, if the lactation journey is ultimately deemed 'unsuccessful' by the mother herself or the others, intense feelings of guilt, inadequacy, and failure may arise (40,42,50,79,133,137,142). This is evident from Renée's account as she described her experience of starting with predominant breastfeeding, encountering latching challenges, addressing these with exclusive pumping and ultimately switching to infant formula:

When he would no longer latch to my breast, that was an adjustment. That was sad too that—not having that bond with him for sure. And then … when I made the decision to stop pumping, I knew that he wasn't going to get breastmilk and I felt like a failure and I knew I wasn't doing the best for my son or I won't be doing the best for my son without giving him breastmilk. So, yeah, that does not feel great. And then, I knew also I would be judged by health professionals. So, that doesn't feel good either. But at the same time, I did as best as I could. So, he got—some people would've given up way, way sooner. And even, like, my public health nurse said the same thing, like, that I'd put a lot of effort into feeding him my breastmilk as you can see with the hour each time every three hours. So, I felt like I gave it my all.

As can be noted from this excerpt, Renée said that both her and her public health nurse included her level of effort to continue feeding human milk in their assessment of the situation. Moreover, mothers used the same logic to assess the experiences of their peers. For instance, when asked about formula-feeding, Nora, a second-time mother, responded:

[It's a] tricky subject. I find people get very offended … Well, I think more people need to give breastfeeding a chance than to just immediately go to formula because there's definitely a lot of health benefits for breastfeeding for the babies … So, I feel like people just give up too quickly.

These findings support previous research by Andrews & Knaak that showed the importance of the perceived effort put into breastfeeding for both internal and external assessment of one's lactation experience (42). This notion underscores that pressure to feed human milk is rooted in the expectations of the good mother to be 'selfless' and thus, prioritize Motherself. Therefore, I argue that this pressure is linked to the positioning of breastfeeding as the epitome of 'good motherhood' rather than the various benefits of human milk. This is evident from the account shared by Emma, a mother of two who formula-fed her older son:

Well, the disappointment is mostly from worrying that I'm not—that I can't sustain her on my own. I haven't had to go to that yet but just taking the path down that road is a little disappointing. I guess that's the word I use for myself — disappointing. Because if I have to stop and feed her formula then, I'll—I don't know, I guess … it still makes you feel, like, almost, like, less of a parent—less [of a] mother for [not] being able to do it.

Emma's account clearly outlines the link between feeding decisions and the internal assessment of the quality of her parenting, as well as her identity as a mother.

7.2.3. Womanself in the lactating body

Womanself

Similar to Motherself, I use the concept of Womanself to represent the aspect of Tri-Self in which self-fulfillment is achieved by meeting the expectations of the related entity (the lactating body). Before I explain my understanding of Womanself, I need to recognize that the term Womanself has been previously used in a different capacity in literary studies. A literary scholar Phanuel Akubueze Egejuru defined Womanself as a state of liberation and resistance to Womanbeing (a state prescribed to women by men) in her analysis of characters in Black Women's novels (198). I draw on Egejuru's concepts of Womanself and Womanbeing, but posit that rather than Womanself being simply the agentive binary pole to Womanbeing's subjugated position, that for the women in this study, Womanself describes an agentive identity, but one that acts to assert itself in ways that are shaped by oppressive norms regarding women's bodies.

Moreover, contemporary infant feeding discourse is dominated by the idea of breastfeeding being 'natural' and 'ideal,' but also requiring close medical attention and control due to the unpredictability of female bodies (6,38,45), creating high and often conflicting expectations (49,185). In addition, the value is put on commodified and commercialized human milk, rather than its producer — the lactating woman — or the act of feeding (6,8,20,89,93). These dominant ideas lead to further disembodiment and disempowerment of women under heteropatriarchy, stripping women from the agency over their own bodies (6,45,92). For instance, Nora asserted:

Well, and the difference too with my husband ... The boobs are the baby's right now and not—not for him ... Like, so, for the sexual [relationship] between me and my husband, that ... I don't want—he doesn't—if we're getting intimate, he is not usually touching my boobs because they do get tender and sore in between, like, they're filling up with milk or empty. So, that's probably more of a difference for him now than for me.

As is evident from Nora's account, she describes how the 'ownership' of her breasts changed from her husband (i.e., in the realm of Womanself) to her baby (i.e., in the realm of Motherself). Although Nora is the one expressing a preference for how her breasts are involved in the sexual activities, she emphasizes that the switch potentially made "more of a difference" for her husband than for her, showing the influence of heteropatriarchy.

Hence, I conceptualize Womanself as an agentive but self-objectified state of the self in relation to the lactating body under heteropatriarchal control. Therefore, Womanself is an agentive identity that is opposed to Motherself but only within the heteropatriarchal framework (i.e., women are searching for freedom to express themselves as women and not just mothers, but on the heteropatriarchal terms). During the early motherhood period, mothers have to adjust to their new embodied subjectivity and establish a new relationship with their changing bodies. In this stage, mothers engage with the external, as well as internalized expectations of what the body will look like, and how it will feel and perform. I conceptualize these expectations along with the category of Womanself because the assessment of the potential of women's bodies to perform maternal practices begins long before women become mothers. For example, when explaining why her husband's family was questioning her ability to breastfeed, Julia said:

I'm going to say because at the time, I was a very ... thin girl ... I didn't have any boobs. So, ... they didn't think I was going to be able to produce anything ... So, it's like, ... to look at my image to be like, "You know, you might not be able to do it because ... you're a thin girl and you don't have much of a boob!" ... You know, you don't want to hear that!

While general heteropatriarchal expectations of women stay the same, the expectations of the body in the lactating state (both from the society and the mother herself) differ from the general expectations of non-lactating female bodies. As such, while the exposure of non-lactating breasts is perceived as positive in the sexualized context, lactating breasts are deemed inappropriate for the public eye and are scrutinized for violating modesty requirements (6,154,199,200). Evidence of women's attempts to negotiate the competing identities of being a mother and being a woman, and the attendant material, social, and cultural expectations, appears in women's descriptions of how and why they breast- versus bottle-feed. Most women preferred to feed at the breast, while some fed expressed human milk in public, as Renée did:

> *I wouldn't say ashamed but more, like, insecure about [breastfeeding in public]. I don't feel that way at all with bottle-feeding because I'm not, like, exposing myself.*

In my model, Renée's choice to bottle-feed in public, but breastfeed at home illustrates how some mothers navigated their changed bodies and identities, as well as competing tensions between Motherself and Womanself. I see this act as prioritizing Womanself while suspending Motherself because Renée is more concerned about "exposing" herself and therefore, violating the requirements of heteropatriarchy rather than the expectations of the feeding culture.

Further to the strategy of bottle feeding in public and breastfeeding at home described by Renée and several other mothers, some also expressed concerns about bottle-feeding in public. Mothers are generally expected to prioritize their maternal responsibilities, including feeding at the breast (49,57,58). Therefore, bottle-feeding in public may be perceived by some as deviant and call a mother's parenting abilities into question (137). The women in this study who bottle-fed in public named their awareness of the way that bottle-feeding contravened expectations of them as mothers and grappled with choosing a feeding modality. For instance, Maria shared her concern about people's perceptions of what she is feeding:

I, kind of, wonder, like, if people think I'm not feeding him breastmilk sometimes … I don't know if you can tell if it's breastmilk or if it's formula if it's just already in the bottle … I think about that sometimes. I wonder if people think I'm just giving him a bottle of formula or breastmilk. Like, they wouldn't know. And that—and that usually is my only thought about it. I'm like, "Hmm, maybe they think I'm formula-feeding. Who knows?"

As evident from mothers' accounts, while women are managing tensions between Motherself and Womanself, fulfilling the expectations of either realm leaves them disempowered and subjugated because of the disembodiment that marks both options.

Lactating body

In my model, Womanself is an aspect of self that represents a relationship with the lactating body under the expectations of heteropatriarchy. This aspect of self is most notably marked by self-objectification and disembodiment which lead to the lack of consistent embodied confidence. I conceptualize human milk expression as a prominent action that prioritizes Womanself.

Transition to motherhood is accompanied by substantial physical and psychological changes (201), including a formation of a new relationship with the lactating body. In heteropatriarchal Western societies, non-lactating breasts are sexualized and perceived positively while lactating breasts are deemed inappropriate and therefore, need to be hidden from the eyes of others (6,154,199,200). The internalization of these dominant ideas can lead to self-objectification (200) and, along with medicalization of motherhood and the prevalence of technological narrative around infant feeding (6,20), contribute to the disembodiment of breastfeeding mothers (201,202).

Nora's account provides an example of this link. When talking about the negative aspects of breastfeeding, she spoke from her husband's perspective and emphasized how her breasts now 'belong' to the baby rather than her husband (see above). The examples of intertwined self-objectification and disembodiment were present in other interviews. For instance, Maria had significant concerns around the changing appearance of her breasts, as well as her ability to breastfeed her future children. She explained:

But now, that I'm lopsided … I just try to make sure my other boob, kind of, filled [up]." Because I just look funny. Yeah, because it's not good. I'm like, "I guess I want to look not like I just breastfeed him all the time" … So, I want my boobs to look good or just the same (laughs). Like, I've heard that [women] have, like, one boob smaller than the other and that's normal. But, like, it's a little bit more obvious when one is full of milk and one is not.

When asked about her breastfeeding plan, Maria shared the following:

My plan is to do it as long as possible honestly. And then, if he does what his brother [did] and bites down on my nipple, then I'm probably just going to pump again … I also need to keep—like, I want to keep my nipple! (laughs). Because we, kind of, do want to plan for another [child] as well. So, yeah. Not right now … but I want to be able to … breastfeed again.

In addition to self-objectification seen in the first excerpt and disembodiment evident from the second quote, Maria's account illustrates that the pain associated with biting (i.e., prioritizing Womanself) was perceived to be not a sufficient enough reason to stop feeding at the breast and switch to exclusive pumping. Therefore, she provided an additional reason of wanting to be able to breastfeed the next child (i.e., prioritizing Motherself) to legitimize her decision.

Although some literature links self-objectification to decreased breastfeeding initiation rates, shorter lactation duration, and internalized negative attitudes toward breastfeeding in public (201,202), this was not present in mothers' interviews. Moreover, I disagree with the cultural feminist view that portrays an increased prevalence of human milk expression as the root cause of maternal disembodiment (154). Examples provided by Nora and Maria show a clear connection between self-objectification and disembodiment. This link is a feminist issue as women are denied their embodied motherhood experience (6,155) and self-objectification is a public health concern as it may also negatively women's mental health (201).

Notably, Maria used pumping to mitigate the relationship with her lactating body in order to improve the appearance of her breasts and protect her nipples from further damage due to latching issues. Human milk expression in the context of milk supply concerns and breastfeeding

challenges was a prevalent topic, as expected based on previous research findings (14,68,140). Johnson and co-authors have also identified that pumping for bottle-feeding may be constructed by mothers as the next best option after feeding at the breast used to mitigate the demands of early motherhood while maintaining the 'good maternal body' (67). Building upon that, in my model, pumping represents an action that allows dual modality feeders to find a new balance by prioritizing Womanself instead of Motherself.

Historic positioning of women's bodies as 'unreliable' and 'unpredictable', as well as the problematic history of changing feeding recommendations and the medicalization of infant feeding, stripped away women's embodied knowledge of breastfeeding (38,45,110,111). This, in combination with high expectations and standards, is known to contribute to lack of confidence in lactation among breastfeeding women in HICs (38,45). Specifically, low maternal self-efficacy is linked to perceived low milk supply (130) that is known to be one of the main reasons for lactation cessation (127,128). In contrast, higher breastfeeding self-efficacy is correlated with a longer lactation duration (203).

Breastfeeding self-efficacy is known to be impacted by various factors, such as previous personal experience, vicarious experience, verbal encouragement, and mental health (204). On the contrary, it was clear from the interviews that confidence in lactation in this study was most closely tied with perceived milk supply. Importantly, consistent reinforcement was needed to sustain maternal confidence regardless of previous experience or support from others. As such, even experienced mothers who perceived producing 'a lot' of milk started to worry about their supply if the behaviour of the infant changed. Moreover, the impact of the feeding culture was identified by the mothers. For example, Maria, a second-time mother who had positive previous feeding experience and even produced 'too much milk' with the second baby explained:

> *I was really worried that, like, my milk supply would go down and before I never had that worry. And I don't know if it's because of age and because I didn't know a lot of other people's experiences at the time but, like, now I know a lot of moms. So, I know that a lot of moms have trouble making milk or trouble breastfeeding or, like, have a lot of different experiences. But I used to not know of [it] at all when I had my first son. So, I never had the worry. Like, I never thought I would not have milk—really, that's that a possibility and it*

didn't faze me at all when I had my first son. And then I had my second son and I'm like, "I got to cover all my bases because you never know!"

Maria's account clearly illustrates her initial embodied confidence that was later diminished by the feeding culture that continues to perpetuate distrust in women's bodies. As a consequence of perceived low milk supply, mothers utilized various strategies aimed to increase supply, including pumping, as well as consumption of oat-containing foods, herbs, and prescription medications with varying levels of effectiveness. Moreover, multiple mothers questioned some of the proposed supply-increasing strategies and noted their high cost. For example, Julia stated:

I do know that I can … [eat] oatmeal [and] drink Gatorade … I've mentioned it before that all these things may help but now, I'm, kind of, second-guessing it. So, whether it's eating oatmeal, like, lactation cookies, those did help out before. They do … get pretty pricey though, after buying, like, four boxes. Then, it's like, "Well, I don't know." So, if I'm not pumping in the meantime, … taking all that stuff that you can try to increase your supply … But a lot of people say that this supplement works … like, fenugreek. But I've tried fenugreek tea but that—or Mother's Milk tea that has fenugreek in it but that severely dropped my supply before. So, I stopped that. But a lot of people say, "It's a fifty-fifty chance whether your supply drops or it does really good [sic]." So, I just drink water. I always have my bottle beside me.

Julia's account underscores the problematic nature of the commercialized feeding culture that puts an expectation on mothers to obtain various expensive supplements to potentially enhance lactation rather than fostering maternal embodied confidence.

7.2.4. Otherself in the non-feeding world

Otherself

In addition to Motherself and Womanself, I use Otherself to conceptualize the elements of women's selfhood that reflect fulfillment through all areas outside of the first two aspects, which I collectively refer to as the non-feeding world. This includes the expectations of others who are not consistently, directly involved in dual modality feeding, such as family members, older children, friends, and colleagues. Out of the three identities of the Tri-Self, Otherself reflects the individuality of the participants the most. Moreover, women express their agency through prioritizing Otherself as they negotiate their own needs via bottle-feeding. For instance, Nora provided the following as one of her reasons for bottle-feeding:

> *Or if I just need a break and want to go have a bath and have a glass of wine (laughs). And [my husband] can give him a bottle!*

My conceptualization of Otherself is based on the sociological understanding of the Other as an oppressed non-dominant identity that is juxtaposed to the privileged dominant Self through the discursive process of othering (205). In my model, Motherself is commonly privileged as the discourse around dual modality feeding is created through its prism and focused on the maternal role while everything else is constructed as 'other than'. Otherself includes numerous states of self that may have played a bigger role prior to being pushed aside by Motherself (e.g., self as an employee, self as a friend, self as a yoga practitioner, etc.)

The influence of Otherself on the experience of dual modality feeding is especially prominent in mothers' decisions around motherhood-employment balance, feeding modality, and the desired duration of lactation. For example, as second-time mother and a small business owner, Emma puts a lot of value in her work. This has influenced her feeding decisions and practices as she explained:

> *[I]n the, like, very, very beginning, ... a lot of people are telling you, you know, "You don't want to start bottle-feeding too early or there is nipple confusion." So, there was a lot of question[s] with that when she was early-fed. But ... it was important to me to start bottle-feeding. So, we started offering it early on.*

Earlier on than they wanted. [Earlier than] it's socially acceptable, I guess I'll say, for as far as nipple confusion is concerned but she did great.

In this instance, Emma is prioritizing Otherself through making a decision to start bottle-feeding "earlier on than they wanted" in order to fulfill the expectations of the non-feeding world by returning back to work. At the same time, she is suspending Motherself and the expectations of the feeding culture and 'good motherhood'.

It is important to note here that Emma's decision to prioritize Otherself and suspend Motherself does not eliminate the expectations associated with the latter. Moreover, upon engagement, mothers' actions are compared to the discursive 'ideal' of that area. The results of this comparison, in turn, will determine both the reactions from others (approval vs. judgement), as well as mothers' feelings (pride vs. guilt). For instance, when Emma engaged with the feeding culture, she experienced judgement from her peers:

I don't go out very much because I work a lot. That was one of the things that, you know, [other moms] said, "Oh, well, we haven't seen you at ... this type of group before." And I said, "Well, no, I work from home. Like, I'm busy. I don't have time." And they said, "Well, it's not good for your daughter. You should be taking her out. How ... she's supposed to ... grow developmentally correct if you don't?" And I was like, "Really? Seriously?"

In contrast, mothers who fulfill the expectations of the feeding culture receive approval and support upon engagement with it. For instance, Tasha is a fifth-time stay-at-home mom who is highly involved in both online and offline feeding culture. She shared a sense of community that she has experienced:

[M]y sister has kids [of] the similar ages and she breastfed them at the same time as I was breastfeeding a couple of my kids. My friends, for the most part, most of them have breastfed. So, you can go to [a] playgroup and ... just kind of all sit together feeding them and stuff. It's kind of like a community at this point with them which is nice.

As can be seen from examples provided by Emma and Tasha, mothers are expected and encouraged to prioritize Motherself while the decision to prioritize Otherself may lead to negative consequences, such as judgement and public disapproval.

Non-feeding world

In my model, Otherself is an aspect of self that represents a path to self-fulfillment through meeting the expectations of the non-feeding world. Most prominently, this includes tensions between the demands of motherhood and the return to paid employment, as well as feeding at the place of work, as Emma described:

> *And especially with it being my business, I don't want to make my customers uncomfortable. So, it's—I'll move to alleviate that … Like, if I'm breastfeeding and a customer walks in, I almost know which ones not to feed in front of because … you know, you can kind of tell.*

Moreover, Emma's account emphasizes the tensions between cultural expectations of 'good' (read: breastfeeding) mothers and professionals that cannot co-exist in public perception. This phenomenon and related motherhood penalties where women are perceived as worse workers, and therefore earn less compared to both fathers and women who do not have children, have been previously described in feminist literature (206,207).

Feeding human milk in the context of a return to paid employment is well-explored through research based in the United States (6,9,71,173) due to the lack of a federal paid maternity leave program (81). Conversely, in Canada most (but not all) mothers are eligible for a paid maternity leave (82), making this topic much less prominent despite the known differences in intersectional positionalities of mothers who do and do not benefit from paid maternity leave (208). Specifically, women who are less likely to be able to access benefits are younger, self-employed, part-time or temporary workers, and identify as Aboriginal, a visible minority, or a recent immigrant, making these groups especially vulnerable (208).

Notably, out of ten mothers who participated in the present study, two returned to full-time employment and one worked part-time by 16 weeks postpartum. Given that three of the ten study participants combined paid employment with the exclusive provision of human milk, return to

work emerged as an important theme. For context, Emma and Nora were self-employed, and Daria returned to paid employment for immigration reasons. Daria's account emphasized the lack of control that she had in regard to this decision as a recent immigrant, making this experience emotionally challenging for her:

> *Well, [in the beginning] I was just, like, missing the baby. I missed being with the baby, seeing him. And I was, like, thinking like, "Why on Earth am I here while I should be home with, like, this little human?" Yeah, and just, overall, I just feel that ... for me personally, it was, like, too early to go back to work. But I don't have much—like, I didn't have much choice. So, I guess I'm just, you know—I'm trying to, like, stay positive and like, think positive[ly] about it. But ... yeah, it's hard. I miss the baby.*

Although Emma's intersectional positionality was substantially different from Daria's, Emma also identified that financial factors were influential in her decision to return to formal work. Moreover, as discussed above, she experienced significant peer judgement and a lack of understanding of the position she was in:

> *Because [other moms]—it's almost like they want to compare their parenting with your parenting. And, you know, if you don't have the same level of parenting, "Well, why not? Why aren't you doing what you're supposed to be doing as a parent?" Well, I'm busy." So, ... there's a lot of judgement around here because you're on a military base. So, ... a lot of the women are military spouses. They don't have to work or they're on maternity leave. I don't have the luxury of having maternity leave. So, you know, it's, "Well, you're supposed to be home looking after your baby." No, I have to be home working. Paying the bills and, you know, living.*

As was clear from the interviews, mothers did not make the decision to return to employment lightly. Moreover, both Emma and Daria had significant support provided mainly by their husbands who cared for the baby while the women were at work. In addition to that,

transition to employment while continuing feeding human milk exclusively required substantial flexibility and creativity. Considering the high proportion of study participants who returned to paid employment during the EHF period, as well as negative emotions and external reactions that were associated with this transition, I argue that there is a need for more research and support for mothers in this area.

In addition to representing a potential return to paid employment, the realm of Otherself includes various aspects of life that are often stigmatized by the discourse of motherhood by being labeled as 'desires' (49,57,59). These factors are often mentioned by mothers as reasons for bottle-feeding, such as a need to rest, separate from their infant, and socialize (14). A theme of utilizing bottle-feeding to negotiate maternal needs was prevalent in the interviews, especially among mothers who had a strong connection to Otherself. For instance, Hannah, a lawyer and a second-time mother, explained:

> *[W]ell, maybe when the weekend comes, [my husband] will take her into another room and sleep with her there and maybe give her, like, two of her feeds from a bottle and then come back in and I can do the rest. So, at least I can get a long stretch [of sleep].*

The influence of the feeding culture that perpetuates dominant ideas around 'good mothering' is evident in current research on dual modality feeding. Felice and co-authors created a framework based on a series of longitudinal interviews with American mothers, and divided reasons for pumping into elective/non-elective and anticipated/non-anticipated (14). Although this work is an important contribution to the underresearched area of dual modality feeding and included a longitudinal component, I argue that there is a need for research that considers a multitude of contextual factors that influence mothers' experiences, including the ideology of intensive mothering (58). I offer a model of reasons and enablers of dual modality feeding in the Canadian context (see Section 7.4).

7.3. Feeding and everything else that comes with: Practices of dual modality feeding

Practical aspects of dual modality feeding constitute an underresearched area. Very little is known about any aspects of dual modality feeding in Canada, as most of the research in this area is done in the United States, a country with drastically different social policies surrounding motherhood (81). Furthermore, most of the research with dual modality feeders focuses on a single practice, such as human milk expression (14) or bottle-feeding (10). I argue that dual modality feeding needs to be explored as a combination of intertangled practices that occur in a specific context that includes supports, social circumstances, and feeding culture. Please note that feeding culture is explored in detail above (see Section 7.2.2).

Practices of dual modality feeding include feeding at the breast, human milk expression, milk storage, preparation of expressed milk for feeding, bottle-feeding, non-feeding uses of expressed milk, and cleaning of the equipment and bottles. In the present study, the majority of the mothers fed predominantly at the breast, with notable exceptions that will be discussed further. Moreover, most of the other practices were also typically performed by the mothers, with occasional involvement from other caregivers, as stated by Hannah:

> *So, I'll just do all her feeding right now. [My son] has enjoyed helping with bottle-feeding. Yeah, ... he really thought [that] she thought it was hilarious that he was bottle-feeding her (laughs). ... So, he's enjoyed that. But yeah, other than that, like, there's not really anybody else involved. Like, I know, ... in the hospital, they, sort of, talk about, like, getting your husband, sort of, even involved in the breastfeeding process. We just haven't really done that for whatever reason.*

Notably, the involvement of other caregivers and family members was quite limited and often constructed as ‘fun’ or elective ‘bonding time’ while mothers did the vast majority of daily feeding and associated chores. For example, Tasha said:

> *My husband definitely is the most supportive. He is my cheerleader ... My husband enjoys [bottle-feeding] too. He finds it fun to feed the baby if he wants it now and then. So, it's nice for him to experience that as well.*

The positioning of a husband as a “cheerleader” who is only feeding for fun can be problematic for mother’s workload related to infant feeding. It is clear that, in this case, Tasha assumes the main responsibility for the feeding process as a whole while her husband does it occasionally if “he wants” to. It was also typical for the mothers to take initiative for others to feed and prepare everything for the feeding. These notions were expected as they fit in the culture of intensive mothering (58).

7.3.1. “But generally, it's just the breast”: Choosing a feeding method based on connection and convenience

Most commonly, mothers indicated two factors that determined their choice of a feeding modality: connection and convenience. Consistent with other research (79), mothers in this study spoke to the great bonding potential associated with breastfeeding as compared to bottle-feeding. Therefore, breastfeeding was the first option for most mothers in circumstances where both options were available to them (i.e., excluding the instances where mothers bottle-fed due to lactation challenges or returning to employment). For instance, Renée explained:

> *There's probably evidence to, like, the euphoric feeling you get when you're feeding your child. You're, like, staring into their eyes, you know, when you're breastfeeding, and you know that you're providing them with the best nutrients possible. And there's just a bonding experience with breastfeeding versus ... a bottle is just, like, you need to get them fed ... [for] them being full. Whereas [breastfeeding] is, like, nurturing as well. Like, ... you're sharing a moment.*

In most cases, mothers also saw breastfeeding as a more convenient option, as Kimberly, a second-time mother, stated:

> *It never crossed my mind to say, "I'll get pumped milk and get him a bottle" because ... it's just another extra step that I just don't—I'm not going to be interested in doing at the moment (laughs). It's ... easier just to, like, lift your shirt up and there it goes.*

Some of the mothers exhibited a very strong preference for breastfeeding and negative feelings associated with bottle-feeding, leading to them avoiding the latter. For instance, Daria talked about breastfeeding feeling “right”:

I'm not—how [to] actually put it into words. It's just, like, this feeling of 'rightness'. Like, you're doing, like, the right natural thing.

In contrast, Daria shared the following about bottle-feeding:

Like, honestly, I'm feeling a little bit uncomfortable even when I'm giving breastmilk through the bottle. But it's probably just my personal view of how the baby should be fed … Just, like, for me it feels weird for the baby to suck on a bottle instead of an actual, like, breast nipple. Yeah, the same—for me, like, the same with the soother. It just doesn't feel right.

When probed about these feelings, Daria identified the feeling she had during bottle-feeding as “guilt”. Bottle-feeding was rarely done by mothers themselves and was instead typically reserved for other caregivers with a goal of connection and bonding. Caregivers who fed with the bottle included partners, other relatives, older children, and friends. For instance, Maria shared:

The first time I had my child, it was a really big bonding experience to—and it still is—to breastfeed and I wanted my husband to have that while he was still here. Either way, right now he still works but we did get him to bottle-feed [our baby] while he was here. So, I also shared that experience with my son recently … I had him [bottle-feeding] too and it was so cute!

Maria’s account was typical: the mothers in this study often initiated bottle-feeding sessions with other caregivers. However, again there were circumstances in which bottle-feeding presented a more convenient option for mothers, including while being in public, on hikes, or during car rides. Tasha tied this convivence closely to her experience and confidence:

With my oldest, it was a little different. I was quite shy about [breast]feeding in public. So, I would actually take a bottle with me to avoid having to feed then. But now, she is my fifth. I'm very comfortable [breastfeeding] and I don't care who's around me anymore ... The only other time I've taken a bottle to bottle-feed since my oldest and since I've gotten more comfortable was when I was at a wedding and I had a dress on that wasn't easy ... to open up for him to breastfeed. And then I took a bottle to feed him there because it was just that that time it was going to be easier to bottle-feed than it was to breastfeed.

In the majority of the cases, mothers indicated the preference for feeding directly at the breast both for convenience and emotional reasons. With that, bottle-feeding was seen as a second option performed in specific circumstances when breastfeeding was either not possible or deemed undesirable.

7.3.2. "I thought it'd be easy, and it wasn't": Dealing with feeding challenges and concerns

Breastfeeding challenges are common (138) and constitute one of the most common reasons for pumping cited in the literature (10). Most typically, mothers use human milk expression as a way to facilitate infant feeding while addressing short-term physical challenges, such as cracked nipples and related latching pain, as Maria explained:

I think he latched different[ly] from my first child. He did cause one side of my breasts to bleed. So, I had to pump one side for a while, he drank from the other one while it healed. So, ... it wasn't as easy as it used [to be], like, the first time around. So, it was surprising.

Some of the mothers in the study experienced more significant latching issues that led to their baby being diagnosed with a tongue-tie and/or lip-tie. Notably, social circumstances and an intersectional positionality of the mothers played a role in how their concerns were addressed. This finding was not surprising considering that Nova Scotia lacks universal coverage for lactation support. For instance, Kimberly, an affluent mother of two, shared her frustrating experience of navigating the healthcare system:

Like, literally, he was born and they're like, "His tongue is tied." (laughs). Like, "Okay!" Like, "Here is your new baby!" … And you're like, "Okay, I'm—I just had a baby. I'm, you know, exhausted." You're healing. You're like, "I just want to go home." And then, real life sets in and you're like, "Ha! How do you navigate this system?"

Later on, Kimberly had an appointment with a lactation consultant:

[The] lactation consultant, she said like, "… There's one doctor that does it at her clinic. But just a heads up, I can't give you a referral. So, you're going to have to go to your GP or your dentist to get the referral." … And I was like, "Okay." … So, you call your GP and like, "Oh, she is out for the week." And you're like, "Okay." (laughs). So, you call your dentist, they send a referral and then, that clinic … they're off for that week too. And then, they didn't call back for a number of weeks. And then, I heard from the public health nurse when I called her … that that clinic doesn't do lip-ties. They only do tongue-ties. So, only a part … of the issue would've been corrected. So, as soon as I heard that, I was like, "There is no question. I'm just going to go the dental route." They'll do everything all at once and you know, … it will be done and over with. … It's way more expensive. Like, four times more expensive but … I also understood from my lactation consultant—she was like, "You're going to have to go to the [clinic] and …, you're going to have to pay for another lactation consultant [appointment] and they're going to have to say 'Yes, this baby is a candidate for the procedure.' And then, you're going to have to wait for the doctor to be able to do it on whatever day of the week they do it down there." So, I'm just like, "Oh man!"… So, it was … interesting, to say the least.

Kimberly later shared that her infant had corrective surgery and she found it very effective. She also had subsequent consultations with a lactation consultant and a chiropractor, as well as a follow-up with the dentist, amounting to a significant financial investment. In contrast, Daria, an immigrant working mother of two, also had a tongue-tie release procedure done on her infant,

and although interested in seeking lactation support, did not follow through due to financial constraints:

> *Like, with this baby, I was, kind of, looking around to see if there're any [support] available. Just again, it was when I … started with, like, pain and nipple shields. But I didn't really find anything. I think I found one group … They offered lactation consultant's help. But … it was quite costly. So, I didn't—I didn't contact them.*

These experiences show a clear need to improve access to supports for mothers with lactation difficulties in Nova Scotia (see Section 7.4). Previous research indicates that although many mothers pump with a goal of increasing milk supply, their supply concerns may actually become more prominent as a result of human milk expression as they can then visually assess the amount of milk produced (89). This was apparent in this study as well: when responding to a question about struggles during her lactation journey, Julia explained:

> *In terms of feeding, no. Pumping, yes. Because if I'm not getting a correct output that I think I should be exceeding—so, like, at least filling up the bottle—so, if I'm not completely full—so, now that I know that … [I] can normally pump five ounces into a bottle, that if I were to go under that, say, three ounces then, I would feel upset. Like, "How come that I'm not doing it? How come I'm not producing enough? What's going on here? Did I drink enough water? Like, what's going on?"*

Another unique challenge associated with dual modality feeding is nipple confusion that presents as an infant's preference for a particular modality of feeding (i.e., breast or bottle) and a difficulty switching between the two (62). Although the link between the age of initiation of bottle-feeding and the development of nipple confusion has been widely debated, it remains a prominent concern among parents and healthcare providers (62). Infant's preference for one feeding modality can be a frustrating experience, as Julia described:

She hated the bottles for … maybe, a month or two. She wouldn't take them. She would cry. So, it's like, I'm wasting my milk. I would just hand it off to [my son] if that was the case. And then, I just have to lean over to her in the car. But other than that, I tried multiple bottles that I've previously had with [my son] and then, bought a new one. And … like, out of the four of them, she liked neither. So, it was a little tough with that.

In most cases, the issues that mothers described were temporary and resolved with more consistent exposure to a feeding method of concern. This was expected as infants show increased efficiency of feeding with increased familiarity with either mode (209,210). With that, more clarification and support for mothers is needed in this area, clarifying messaging around exposure rather than with a specific age at which nipple confusion is thought to self-resolve regardless of previous experience.

7.3.3. "They always say you can use breastmilk for everything": Non-feeding uses of expressed milk

The topic of using human milk for non-feeding purposes is a prominent feature of the online feeding culture and is closely related to the dominant narrative of 'liquid gold' (see Section 7.2.2). There is also a small body of literature exploring potential non-nutritive benefits of human milk, mainly surrounding the benefits of topical application, with encouraging but inconsistent results (211). This theme was also prominent in this study, with virtually all mothers using human milk for something other than feeding their infant. Most commonly, mothers applied their milk to rashes and sores, as Kimberly described:

And I've also used it on, like, skin. So, … if I had a crack or some kind of sore spot on my breast, I would put it on it and leave it. And I've also put it on, like, their faces when they've had, like, baby acne or, like, little spots that seemed to be a little worse than others or a little cut when they cut themselves with their fingernails.

Mothers also fed human milk to older children, mainly due to its perceived immunological properties. Notably, the milk was typically ‘hidden’ in cow’s milk or consumed in the form of a popsicle without children’s knowledge of its contents. For instance, Nora shared the reactions she got from her older son and her husband to this idea:

> *[My son] sees me breastfeeding. He just turned four. He weaned himself off when he was fifteen months when I breastfed him. But it's funny — he's seen me collecting it and then I just handed the bottle straight to him ... "Here, drink it!" and he's like, "No!" And ... I'm like, "Just try it!" and he's already had it, right? (laughs). "Here, just try it!" — "No, you try it!" ... and he would not have it that way when he's seen where it was coming from, but he loved the breastmilk popsicle that I made him coming from the freezer. So, that was kind of funny. My husband was like, "What are you—don't give him that!" and I'm like, "Why not?"*

This notion emphasizes the paradox of human milk being seen as cure-all ‘liquid gold’ and ‘gross’ bodily fluid at the same time (156). Both of these points of view are problematic and unproductive as these focus on human milk as a desirable or undesirable product rather than supporting mothers who may or may not choose to produce or use it. Expectedly, mothers described intense pressure to save all their milk and find uses for it, even if it was perceived unsuitable for consumption. The most prominent example for milk no longer suitable for consumption was ‘milk baths’, either for an infant or a mother. Notably, mothers knew about various non-feeding uses of human milk but most of them ended up discarding it when it was perceived to have spoiled. At this point, throwing out the milk was seen as appropriate, emphasizing the value of milk and the importance of the amount of effort put into the process of saving it, fitting into to the overall narrative around feeding human milk (42). Nora explained:

> *I have a jar that I put it in in the fridge just to keep for—to put in his bath or to use on his rashes. I try not to waste any of it. But then, it does go bad after a while in that too. Like, there's, kind of, an optimal time of when I would want to feed it to him. So, if I heat it up then, I use it within two hours. If it's gone past*

the two hours, then, I use it for other stuff. So, I did have a jar [that was] getting pretty full in the fridge and opened it the other day and it just smelled really bad. So then, that I dumped down the sink (laughs).

Moreover, some of the mothers described creative uses for their milk, such as cooking and baking with their milk, as well as using it for yeast growing and soap making. These ideas are prominent on social media (212), supporting the narrative of 'liquid gold' (188). Moreover, Tasha shared that she wanted to get a piece of 'breastmilk jewellery' to commemorate her lactation experience:

I've seen it [online] for a while. I also cloth-diaper so, I follow a couple bloggers and ... I found out about it from the blogger I ... follow and I thought it is a very neat way to, kind of, mark—because breastfeeding, like—I've breastfed my children for varying lengths of time that it's, kind of, like, it's—it's—it's a big experience for me, means a lot to me. So, I, kind of, want a little something to remember the experience with. So, that's why I thought that I want to get [it] done.

Tasha's account provides an insight into a lactivist feeding culture that supports the narrative of 'liquid gold' along with online experience sharing and cloth-diapering. I see these as prominent signs of a particular type of mothering that is idealized and promoted online: intensive, connected, and environmentally conscious (read: white, middle-class and educated). I regard this narrative as problematic as it puts on a pedestal one specific type of mother leaving everyone else behind instead of connecting and uplifting all mothers while making lactation a feasible infant feeding option available to all.

7.3.4. "[A]t least a year if not longer": The road ahead

The WHO recommends exclusive human milk feeding for 6 months and continued consumption of human milk along with appropriate complementary foods for up to two years and beyond (2). With that, mothers' lactation plans varied depending on the social and family circumstances, as well as their involvement in the feeding culture and therefore, the level of

pressure to breastfeed. For example, Kimberly, an affluent white mother of two who is deeply involved with the feeding culture both personally and professionally as a dietitian, shared the following:

> *[I]f I couldn't [breastfeed] or if for some reason I had to stop, I would feel that I wasn't providing the best for my baby … I think from that perspective I would feel almost devastated that I couldn't nurse as long as I wanted to, or he wanted to. … I think I'd just go until he doesn't want to do it anymore. And I think with [my older son], a part of it too was [that] we didn't know if we're able to have more children. So, it was something I didn't want to stop because it was possibly my only opportunity to do so. That was a big thing with [my older son] … So, when we ended up finding out [that] … we were going to have another baby, I didn't want to stop but not feeling great during the pregnancy was a bit of a push to stop. So, I think from that perspective, like, if I couldn't [breastfeed for] as long as I did with [my older son] with [my baby] then, you know, I'd feel a bit sad. That would be more of, like, the internal, I guess, pressure.*

Notably, multiple mothers in the study have had a previous experience of feeding human milk for twelve months and longer. Most of the mothers cited biting and self-weaning as a reason to stop breastfeeding. Some mothers also pumped to prolong the period of human milk consumption, as Maria shared:

> *Like, I remember when I stopped breastfeeding my oldest—I really honestly didn't want to stop but it was to the point where he was biting my nipple because … he had four teeth in from the two tops and the two bottom ones where I could only pump anymore because it was hurting way too much for him to keep breastfeeding … from me. So, I'm hoping to breastfeed this one longer, but it honestly depends on how he's going to feed. Because if he bites my nipple every time like his brother did, I'm not for that. So, bonding is, like, hurting me now (laughs).*

Even though mothers' perspectives on the desired or appropriate length of lactation varied considerably, ceasing it was typically associated with feelings of sadness and nostalgia, Tasha explained:

> *I'll miss it when [my baby] … weans. I'll be very—I'll be sad because it'll mean, like, that part of my life is over. So, where she's going to be my youngest. So, … it's going to be a sad experience when she's done. With each of them, when they've weaned, I've always felt a little bit like, "Oh, like, … you're older now, that's no longer part of our lives moving forward!" Like, yeah, I'll miss that part of motherhood.*

Tasha's account also clearly emphasizes the emotional charge and connection of infant feeding to the overall motherhood experience. In my view, this should be at the centre of support programs for mothers, no matter which feeding method they practice.

7.4. Implications for future support programs

Despite the known prevalence of human milk expression and bottle-feeding human milk in HICs, there is a lack of research on dual modality feeding, as well as support programs for mothers managing dual feeding modalities. Based on the findings of the present study, I offer a conceptual framework of reasons and enablers of dual modality feeding in the Nova Scotian context (see **Figure 2**).

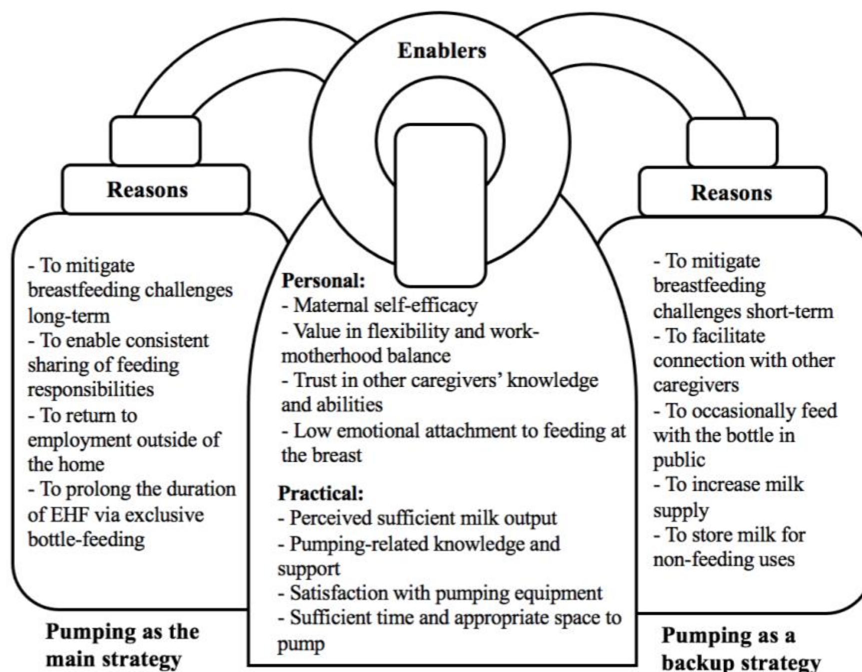

Figure 2. Conceptual framework of reasons and enablers of dual modality feeding in the Canadian context.

It was evident from the interviews that enablers of dual modality feeding are consistent for mothers who utilize human milk expression as the main strategy and as a backup strategy, whereas the reasons for pumping were different between these two groups. The two most prominent categories of enablers included practical and personal factors. The presence of enablers from both categories is required for dual modality feeding to be successful. Therefore, new support programs need to be feminist-informed (i.e., mother-centered) and focused on the practical enablers and maternal self-efficacy. For instance, these should include evidence-based, non-commercial information on the process of human milk expression, differences between pumping equipment, as well as the availability of pump rental programs.

Moreover, based on the findings of this study, healthcare support focused on common lactation and pumping difficulties needs to be enhanced. For instance, there is a clear need for improvement in access to timely tongue-tie and/or lip-tie releases, followed by lactation support provided by trained healthcare professionals, such as International Board-Certified Lactation Consultants (IBCLCs). Moreover, realistic expectations for milk output, as well as evidence-based strategies to increase milk supply and address common concerns need to be identified and

communicated to the mothers. Furthermore, healthcare professionals and scholars should engage in advocacy for maternity leave for all, and universally covered professional lactation support for Canadian mothers.

8. Study limitations

This study adds to a very limited body of knowledge on dual modality feeding in HICs. However, this inquiry is limited to the experiences of Nova Scotian women who practice dual modality feeding. Therefore, the results may not be applicable to mothers who either feed at the breast or express human milk exclusively, or who mix-feed with human milk substitutes. Moreover, considering the known determinants of breastfeeding, it is crucial to avoid historic feminist homogenization of women's experiences by acknowledging that the participants occupy specific intersectional positions and their experiences may also not be applicable to all mothers who breastfeed and bottle-feed, depending on their social positionality and unique individual characteristics (179).

Despite a strong theoretical base, there are certain limitations associated with the used methodology, such as the potential for social desirability bias and the complex interplay of interviewee's and interviewer's multiple identities to influence the results (179). Although typical for qualitative inquires, a small sample size of ten participants presents a potential limitation. Additionally, part of the data was collected during COVID-19 pandemic restrictions in Nova Scotia which may have impacted mothers' experiences, particularly related to feeding in public and availability of in-person supports.

9. Conclusions

Dual modality feeding occupies a unique contested space within the culture of intensive mothering in Nova Scotia and beyond. The experience of dual modality feeding is distinct from both the experiences of exclusive breastfeeding and exclusive pumping, and involves substantial identity tensions and unique practical aspects.

Mothers use dual modality feeding as a strategy to manage tensions between the main aspects of the Tri-Self: Motherself, Womanself, and Otherself. These are distinct embodied identities formed under the expectations of the feeding culture, management of the lactating body and the non-feeding world (i.e., all areas of life unrelated to motherhood). Mothers satisfice competing demands and priorities via practices of dual modality feeding, such as feeding at the breast, pumping and bottle-feeding. Each of these actions represents prioritizing and suspending in relation the identities comprised by the Tri-Self and therefore, may lead to different reactions and consequences depending on the circumstances.

As for the practical aspects of dual modality feeding, these emphasize choosing a feeding modality depending on the circumstances and addressing lactation challenges in the context of the feeding culture, social circumstances and supports. The enablers of dual modality feeding included practical and personal aspects. These remained consistent for the mothers who used pumping as the main strategy and those who only pumped as a backup while the reasons differed between the two groups.

Dual modality feeding mothers experience high levels of external and internalized pressure, as well as high expectations, while the available supports are often deemed inadequate. The findings of this study emphasize the importance of tailoring future support programs to dual modality feeding families by focusing on practical enablers and maternal self-efficacy. Moreover, broader feminist-informed advocacy around maternity leave for all and universal coverage for lactation support are needed.

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Appendices

Appendix A. Study recruitment poster.

WOULD YOU LIKE TO SHARE YOUR BREASTFEEDING EXPERIENCES ?

You **may** be eligible to participate in a research study if your baby is **younger than 8 weeks of age** and you are **breastfeeding both directly at the breast and also pumping and feeding your milk in bottles**.
You must also **live in Nova Scotia.**

You will be invited for **two one-on-one interviews** (in-person or over the phone). You will receive **$20 for each interview ($40 in total)**.

Contact researchers at the MAMA Lab for more information:
www.mamalab.ca
mama.lab@msvu.ca
(902) 943-5652 (call or text)

This study has received ethics approval from the Mount Saint Vincent University Research Ethics Board (#2020-009) and the Ethics Board of the University of Prince Edward Island (#6008074)

Appendix B. Interview guide

REFINE: The experiences of caregivers breast- and bottle-feeding of human milk
Interview Guide

IDENTIFICATION INFORMATION
Subject ID: __ __ __ Interviewer Code: __ __ __
1. Date of Interview: (DD/MM/YYYY) ___ ___ / ___ ___ / ___ ___

INTERVIEW I: 6-8weeks

1. First, I would like to know why you wanted to come for this one-on-one interview. Do you have anything in particular you would like to share?

2. Please tell me about yourself and your family.
Possible Probes:
    a. What do you do? Are you currently on maternity leave?
    b. Do you have a partner? What do they do?
    c. How many children do you have? How old are they?

3. Please tell me why you decided to breastfeed your baby.
    a. How did you come to this decision?
    b. Who was involved in decision-making?
    c. Did you feel any pressure to breastfeed? If so, from whom?
    d. Why did you decide to pump breastmilk and bottle-feed along with feeding at the breast?
    e. Have you considered formula? How do you feel about formula-feeding?

4. Please tell me about infant feeding in your family.
    a. Who is involved in it and why?
    b. Who has a leading role?
    c. How are the responsibilities shared among the different caregivers involved in feeding?
    d. Do caregivers have assigned roles or responsibilities?

5. Please tell me about your infant feeding routine.
    a. How often do you feed the baby?
    b. What do you feed the baby throughout the day?

c. How often do you feed the baby from the breast versus the bottle? What proportion of feeds are usually from the breast and bottle?
d. How do you decide/what factors do you consider in deciding whether to feed from the breast or bottle? Does being in public influence your decision?
e. How feeding your baby make you feel? Is it any different when you feed from the breast versus the bottle?

6. Please walk me through how you pump, store, handle, and prepare breastmilk for bottle feeding.
   a. When, where, and why do you pump milk?
   b. How do you prepare for pumping? Do you do or take anything to increase your milk supply? Where did you get this information from?
   c. After the milk is pumped, what do you do with it?
      i. How do you store it? Why?
      ii. What factors influence how and for how long you store the pumped milk?
   d. After you have stored the milk, how do you handle the milk to get it ready for the baby?
      i. How do you thaw frozen milk?
      ii. How do you warm up milk to prepare it for a feeding?
      iii. Once the milk is ready, how, when, and where do you feed it to baby?
      iv. Why do you do it this way? Where did you get the information about this?
   e. Is that what always happening? Do other caregivers follow the same guidelines?
   f. Do you use breastmilk for anything other than feeding your baby? If so, how and why?
   g. Do you ever throw out breastmilk? When? Why?

7. Next, I would like to ask you about the feeding itself.
   a. What prompts you to start and stop a feeding?
   b. How do you know that your baby is hungry?
   c. Full?
   d. What if there is some milk left in the bottle? Do you put it back or throw it out?
   e. Do other caregivers follow the same signs?

8. Is your breastfeeding experience with this baby any different compared to your experience feeding your older child/children?
   a. How so?
   b. Why do you think your experiences are different?
   c. Do you feel that your previous experience was more or less challenging?
   d. What challenges have you had during your previous breastfeeding experience(s)? This time?

9. Are you following any particular advice, method or guidelines for infant feeding?
   a. Where are you getting this information?
   b. Which source of information do you trust the most?

c. If you have questions, where do you go to?

10. Where do you get support around feeding your baby?

a. Out of your family members and friends, who supports you the most? How?

b. Have you ever attended breastfeeding support groups? Why or why not? What was that like?

c. Have you ever talked to a lactation consultant? Why or why not? What was that like?

d. Have you ever looked for support online? Why or why not? What was that like?

11. What kinds of reactions do you usually get from others around feeding your baby? Have you ever had negative reactions from others (or experienced stigma) around feeding your baby?

a. If so, tell me about how those negative reactions (or stigma) about how you feed your baby has influenced your feeding practice?

b. Have you ever experienced negative reactions from others or stigma when you were breastfeeding in public? If so, tell me more about this experience.

c. Have you ever experiences negative reactions from others or stigma related to bottle feeding your baby? If so, tell me more about this experience.

12. How does feeding your baby usually make you feel? Have you ever had negative feelings related to feeding your baby?

a. Have you ever experienced negative feelings around breastfeeding? If so, tell me more about these feelings.

b. Have you ever experienced negative feelings around bottle feeding and/or pumping? If so, tell me more about these feelings.

c. Do you think these negative feelings have influenced how you are feeding your baby? If so, how?

13. These are all of my pre-written questions. I will now quickly go through what we have discussed. Is there anything about how or why you feed your baby that you would like to share that I haven't asked you about yet, or that you haven't had a chance to mention?

INTERVIEW II: 20-22 weeks

1. First, I would like to thank you for coming for this follow-up interview. Were there any major changes in your approach to infant feeding since we last talked? Is there something in particular you would like to share today?

2. Has anything changed since the last interview in regard to the approach to infant feeding in your family?
Possible Probes:
   a. Who is involved in it and why?
   b. Who has a leading role?
   c. How are the responsibilities shared among the different caregivers involved in feeding?

3. Please tell me about your infant feeding routine. Has anything changed since the last interview? Have you added any foods other than breastmilk in your baby's diet? If so, which ones and why?
   a. How often do you feed the baby breastmilk or other foods?
   b. What prompts you to start and stop a feeding/meal time?
   c. What do you feed the baby throughout the day? If you introduced complimentary/solid foods, which products have you introduced first and why?
   d. How often do you feed the baby from the breast versus the bottle? What proportion of feeds are usually from the breast and bottle and/or complimentary/solid foods?
   e. How do you decide/what factors do you consider in deciding whether to feed from the breast or bottle or complimentary/solid foods?
   f. How does participation in feeding your baby make you feel? Is it any different when you feed from the breast versus the bottle versus other foods?

4. Has anything changed in the way you pump, store, handle, and prepare breastmilk for bottle feeding? Why do you do it this way?
   a. Do you do or take anything to increase your milk supply? Where did you get information about this?
   b. Do you use breastmilk for anything other than feeding your baby? If so, how and why?

5. Next, I would like to ask you about the feeding itself.
   a. What prompts you to start and stop a feeding?
   b. How do you know that your baby is hungry?
   c. Full?
   d. Do other caregivers follow the same signs?

6. I'd like to chat about complementary feeding (feeding solids).
   a. What do you know about baby's first foods?

b. When will you / did you start introducing foods? How did you choose this time? How would you describe your experiences with complementary feeding?
c. Did you seek out guidance regarding feeding complementary/solid foods to your infant? If so, from where/whom?
d. Who typically prepares these foods to your baby? Who feeds them? Why?
e. What does complementary feeding look like in your family? (i.e., consumed at family mealtimes, alone, etc.)

7. Are you following any particular advice, method or guidelines for infant feeding?
a. How have you decided which products to include in your baby's diet as complementary/solid foods?
b. Where are you getting this information?
c. Which source of information do you trust the most?
d. If you have questions, where do you go to?

8. Last time we also talked about how this breastfeeding experience is different compared to your experience feeding your older child/children. Have you noticed any more differences?
a. Why do you think your experiences are different?
b. Do you feel that your previous experience was more or less challenging?
c. What challenges have you had during your previous (breast)feeding experience(s)? This time?

9. Last time we talked about support that you are getting around feeding your baby? Has anything changed in this area?
a. Out of your family members and friends, who supports you the most? How?
b. Since our last conversation, have you attended breastfeeding support groups? Why or why not? What was that like?
c. Have you talked to a lactation consultant? Why or why not? What was that like?
d. Have you looked for support online? Why or why not? What was that like?

10. Last time we also talked about why you decided to breastfeed. How are you feeling about this decision now? Has anything changed in your outlook on breastfeeding? Why?

11. How, if at all, have the views or preferences of other caregivers influenced your feeding practices? If so, how? Has this changed since the last interview?
a. What, if any, particular things about feeding your baby that you stopped doing because of another caregiver's views or preferences?
b. Are there any things that you changed or started doing to feed your baby because of another caregiver's views or preferences?
c. What made you adopt, change, or stop a particular way of feeding your baby?
d. How are you making decisions about how to feed your baby?
e. So far, who has been the most influential in how you feed your baby?

12. What kinds of reactions do you usually get from others around feeding your baby? Have you ever had negative reactions from others (or experienced stigma) around feeding your baby?

a. Have you ever experienced negative reactions from others or stigma when you were breastfeeding in public? If so, tell me more about this experience.
b. Have you ever experiences negative reactions from others or stigma related to bottle feeding your baby? If so, tell me more about this experience.
c. If so, tell me about how those negative reactions (or stigma) about how you feed your baby has influenced your feeding practice?
d. How did those experiences make you feel? How do these relate to your overall motherhood experience?

13. How does feeding your baby usually make you feel? Have you ever had negative feelings related to feeding your baby?

a. Have you ever experienced negative feelings around breastfeeding? If so, tell me more about these feelings.
b. Have you ever experienced negative feelings around bottle feeding and/or pumping? If so, tell me more about these feelings.
c. Do you think these negative feelings have influenced how you are feeding your baby? If so, how?
d. Have you ever felt that you were struggling or not doing enough in relation to feeding your baby? If so, tell me more about these feelings.
e. Have you ever felt ashamed or guilty because of your infant feeding choices? If so, tell me more about these feelings.
f. How do these feelings/experiences relate to your overall feelings around motherhood?

14. These are all of my pre-written questions. I will now quickly go through what we have discussed. Is there anything about how or why you feed your baby that you would like to share that I haven't asked you about yet, or that you haven't had a chance to mention?

Appendix C. Demographic questionnaire.

REFINE: The experiences of caregivers breast- and bottle-feeding of human milk
Questionnaire (Mothers)

IDENTIFICATION INFORMATION
Participant ID: __ __ __
Date: (DD/MM/YYYY): ___ ___ / ___ ___ / ___ ___ ___ ___

MODULE 1: SOCIODEMOGRAPHIC INFORMATION	
1. What is your date of birth? (DD/MM/YYYY)	__ __ / __ __ / __ __ __ __
2. What is your marital status?	1) Married 2) Common-law 3) Divorced/Separated 4) Single 5) Other: _________ 6) Prefer not to answer
3. **You** may belong to one or more racial or cultural groups on the following list. Are you: *(Please check all that apply.)*	1. White 2. Chinese 3. South Asian (e.g. East Indian, Pakistani, Sri Lankan) 4. Black 5. Filipino 6. Latin American 7. Southeast Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese) 8. Arab 9. West Asian (e.g. Afgan, Iranian) 10. Japanese 11. Korean 12. First Nations (North American Indian) 13. Métis 14. Inuk (Inuit) 15. Other: _________ 16. Don't know 17. Prefer not to answer
4. **Your baby** may belong to one or more racial or cultural groups on the following list. Is he or she:	1. White 2. Chinese 3. South Asian (e.g. East Indian, Pakistani, Sri Lankan)

(Please check all that apply.)	4. Black 5. Filipino 6. Latin American 7. Southeast Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese) 8. Arab 9. West Asian (e.g. Afghan, Iranian) 10. Japanese 11. Korean 12. First Nations (North American Indian) 13. Métis 14. Inuk (Inuit) 15. Other: __________ 16. Don't know 17. Prefer not to answer
5. What is the highest level of education you have completed?	1. Some high school education 2. High school diploma 3. College degree 4. Undergraduate degree 5. Graduate degree 6. other: __________ 7. Prefer not to answer
6. What is your household's total annual income?	1. Less than $10,000 2. 10,000 to $19,999 3. $20,000 to $29,999 4. $30,000 to $39,999 5. $40,000 to $49,999 6. $50,000 to $59,999 7. $60,000 to $69,999 8. $70,000 to $79,999 9. $80,000 to $89,999 10. $90,000 to $99,999 11. $100,000 to $149,999 12. $150,000 or more 13. Prefer not to answer

MODULE 2: ANTENATAL CARE AND DELIVERY	
7. How many live births have you had, including this baby?	___
8. Infant's date of birth (DD/MM/YYYY).	__ __ / __ __ / __ __ __ __
9. Infant sex.	1. Male 2. Female

10. Infant birth weight.	____ . ____ kg OR ____ lb and ___ oz
11. Infant birth length.	____ ____ . ____ cm, OR ____ ____ . ____ inches
12. Infant head circumference at birth.	____ ____ . ____ cm, OR ____ ____ . ____ inches

MODULE 3: INFANT AND YOUNG CHILD FEEDING PRACTICES			
13. When did you stop breastfeeding your **second youngest** child? (MM/YYYY)	__ __ / __ __ __ __ *77 / 7777 = currently still breastfeeding 2nd youngest child* *99/9999 = first time mother*		
14. Until what age do you plan to breastfeed your baby?	___ ___ months		
15. Were you breastfed as a baby?	1. Yes 2. No 3. I don't know		
16. What foods did your baby consume in the **last 2 weeks**? *(Please check all that apply.)*	o breast milk o breast milk substitute (baby formula) o water o cow's milk o soy milk o almond milk o medicine, such as oral rehydration salts o baby food o other: ________________		
17. How often in the **last two weeks** did your baby consume food or drink **other than** breastmilk? *Answer 0 if baby is exclusively breastfed.*	____ ____ ____ instances		
18. How many times in 24 hours do you **usually** feed your baby with breastmilk?	____ ____ instances		
19. Of these feeding instances with breastmilk, please describe how the breastmilk is **usually** fed.	Directly from the breast: ____ feeds/24hrs	Breast milk in a bottle: ____ feeds/24 hrs	TOTAL: ____ feeds/24 hrs
20. How many times in 24 hours do you **usually** pump breastmilk?	____ ____ ____ instances		

Thank you for your participation!

Appendix D. MSVU Research Ethics Board clearance certificate.

University Research Ethics Board (UREB)

Certificate of Research Ethics Clearance

☒	Clearance	☐	Secondary Data Clearance	☐	Renewal	☐	Modification	☐	Change to Study Personnel

Effective Date	**June 26, 2020**	**Expiry Date**	**June 25, 2021**

File #:	**2020-009**
Title of project:	Responsive Feeding of Infants with Expressed Milk (REFINE): the experiences of caregivers breast- and bottle-feeding of human milk
Researcher(s):	Kyly Whitfield
Supervisor (if applicable):	n/a
Co-Investigators:	Melissa Rossiter; Jennifer Brady; Erna Snelgrove-Clarke
Version :	1

The University Research Ethics Board (UREB) has reviewed the above named research proposal and confirms that it respects the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and Mount Saint Vincent University's policies, procedures and guidelines regarding the ethics of research involving human participants. This certificate of research ethics clearance is valid for a period of **one year** from the date of issue.

Researchers are reminded of the following requirements:	
Changes to Protocol	Any changes to approved protocol must be reviewed and approved by the UREB **prior** to their implementation. **Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003**
Changes to Research Personnel	Any changes to approved persons with access to research data must be reported to the UREB immediately. **Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003**
Annual Renewal	Annual renewals are contingent upon an annual report submitted to the UREB **prior** to the expiry date as listed above. You may renew up to four times, at which point the file must be closed and a new application submitted for review. **Form: REB.FORM.003 Info: REB.SOP.116 Policy: REB.POL.003**
Final Report	A final report is due on or before the expiry date. **Form: REB.FORM.004 Info: REB.SOP.116 Policy: REB.POL.003**
Privacy Breach	Researchers must inform the UREB immediately and submit the Privacy Breach form. The breach will be investigated by the REB and the FOIPOP Officer. **Form: REB.FORM.015**
Unanticipated Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within seven (7) working days of the event. **Form: REB.FORM.008 Info: REB.SOP.115 Policy: REB.POL.003**
Adverse Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within two (2) working days of the event. **Form: REB.FORM.007 Info: REB.SOP.114 Policy: REB.POL.003**

*For more information: http://www.msvu.ca/ethics

DSeguin

Dr. Daniel Séguin, Chair
University Research Ethics Board

Halifax Nova Scotia B3M 2J6 Canada
Tel 902 457 6350 • msvu.ca/ethics

Appendix E. UPEI Research Ethics Board clearance certificate.

To: K Whitfield
Applied Human Nutrition; Mount St Vincent University

Protocol Number: REB Ref # 6008074

Title: Feeding infants in Nova Scotia: an exploratory Analysis of Responsive Feeding with Mother's Milk (REFINE Study)

Date Approved: May 23, 2020 **End Date:** May 22, 2021

The renewal of this research proposal has been reviewed and approved by the UPEI Research Ethics Board. Please be advised that the Research Ethics Board currently operates according to the Tri-Council Policy Statement 2: Ethical Conduct for Research Involving Humans (2018) and applicable laws and regulations.

It is your responsibility to ensure that the Annual Renewal and Amendment Form for Approved Studies is forwarded to Research Services prior to the renewal date. The information provided in this form must be current to the time of submission and submitted to Research Services not less than 30 days prior to the anniversary of your approval date. The Renewal/Amendment form can be downloaded from the Research Services website (http://www.upei.ca/research/forms).

The Research Ethics Board advises that IF YOU DO NOT return the completed Ethics Renewal form prior to the date of renewal:

- Your ethics approval permit will lapse;
- You will be required to stop research activity immediately;
- You will not be permitted to restart the study until you reapply for and receive approval to undertake the study again.

Lapse in ethics approval may result in the interruption or termination of funding.

Any proposed changes to the study must also be submitted on the same form to the UPEI Research Ethics Board for approval.

Notwithstanding the approval of the REB, the primary responsibility for the ethical conduct of the investigation remains with you.

Sincerely,

Hayden Woodley, Ph.D.
Chair, UPEI Research Ethics Board

550 University Avenue, Charlottetown, Prince Edward Island, Canada C1A 4P3 *people • excellence • impact*

Appendix F. Consent form.

Excellence • Innovation • Discovery

CONSENT FORM: MOTHER
REFINE: The experiences of caregivers breast- and bottle-feeding of human milk

Introduction
This is a consent form for the study entitled "The experiences of caregivers breast- and bottle-feeding of human milk". Before you decide if you want to participate, it is important that you understand the purpose of the study, what you will be asked to do, and the risks and benefits. We will give you all of this information before asking for your consent to participate. A member of the research team will be available to answer any questions you may have. You may decide not to participate. You may also withdraw from the study at any time without any problems. Your participation is entirely voluntary.

Who is conducting the study?
Dr. Kyly Whitfield, Principal Investigator, Assistant Professor
Department of Applied Human Nutrition, Mount Saint Vincent University
Phone: (902) 457-5978. E-mail: kyly.whitfield@msvu.ca

Dr. Misty Rossiter, Co-Investigator, Associate Professor
Department of Applied Human Sciences, University of Prince Edward Island
Phone: (902) 620-5224. E-mail: mdrossiter@upei.ca

Dr. Jennifer Brady, Co-Investigator, Assistant Professor
Department of Applied Human Nutrition, Mount Saint Vincent University
Phone: (902) 457-6260. Email: jennifer.brady@msvu.ca

Dr. Erna Snelgrove-Clarke, Co-Investigator, Director & Vice-Dean
School of Nursing (Health Sciences), Queen's University
Phone: (613) 533-2669. Email: erna.snelgroveclarke@queensu.ca

This study is funded by Research Nova Scotia (formerly known as Nova Scotia Health Research Foundation). The researchers have no conflicts of interest to report.

What is the study about?
It is known that breastfeeding is the best way to feed babies for the first 6 months. Yet, there isn't as much research on *how* or *why* mother's milk is fed to Canadian infants. We want to hear from mothers about things such as why you pump milk, how you store and feed it to your baby. We will also ask about your perceptions and experiences feeding your infant, if or where you got information or advice about infant feeding, and about whether you've ever experienced stigma regarding how you've fed your baby.

Who can participate?
You may be eligible to participate if you:

- are 19 years or older,
- currently live in Nova Scotia,
- have a healthy singleton baby who is younger than 8 weeks of age who is fed mother's milk directly from the breast and from a bottle,
- plan to exclusively feed the baby mother's milk up to 6 months.

You are not eligible to participate if:

- your baby was born preterm (earlier than 37 weeks gestation),
- you plan to move in the next 6 months.

Taking part in this study is completely voluntary. You may choose not to take part or may leave the study at any time. You do not have to give a reason for your decision.

What will participation in this study look like?
You will be asked to come to Mount Saint Vincent University, or the researcher will come to your home for the interview. The interview can be also done over the phone. The interviews will take about 1-1.5 hours and will be audio recorded. We will transcribe the interview verbatim, but will replace any names you use with pseudonyms.

We will ask to do a second interview with you when your baby is between 20-22 weeks old.

Participation in this study is entirely voluntary and will not cost you anything. As a thank you for your time and participation, you will receive $20 at the end of each visit. If you decide to withdraw from the study during an interview, you will still receive compensation. In this case, the audio recording of your interview will be destroyed.

Confidentiality
Your confidentiality will be respected. Your records will be kept in a locked cabinet in the Milk and Micronutrient Assessment Lab (MAMA Lab) at Mount Saint Vincent University. All electronic data will be stored on a university-based, password protected server. We will give you a unique study number as a participant in this study. Only this number will be used on any research-related information collected about you during the course of this study. Your identity [i.e. your name or any other information that could identify you] will be kept confidential. Only Principal Investigator will have access to any data that contains your personal information (such as this consent form). The list that matches your name to the unique study number will not be removed or released.

Only the research team will view and analyze the information gathered as part of this study. The results of the study may be presented at scientific meetings, published in a scientific journal and used for Master's Theses. If the results are published, only group values will be reported. Pseudonyms will be used if your interview responses are quoted. All data will be kept on a locked database for 5 years and then securely destroyed.

Please note that data will be kept confidential within the confines of the law. For instance, if we come across an evidence of abuse in a course of this study, we are obligated to report it to appropriate authorities, such

as Halifax Regional Police.

Risks
We do not believe there are any risks involved with participation in this study.

Benefits
You will not receive direct benefits from participating in this study. You will have the benefit of contributing to research. We hope that the results of this study can be used to inform future research, public policy and education programs about the feeding of young children.

Questions and further information
Participation in this study is completely voluntary. Also, you have the option to stop participating and withdraw from the study at any time without any problems.

If you have any questions or would like further information about this research, please contact Dr. Kyly Whitfield, the Principal Investigator, at kyly.whitfield@msvu.ca, or by phone at (902) 457-5978.

If you have questions about how this study is being conducted and wish to speak with someone who is not directly involved in the study, you may contact the MSVU Research Office at (902) 457-6350 or via e-mail at research@msvu.ca. You can also contact the UPEI Research Ethics Board at (902) 620-5104, or by email at reb@upei.ca if you have any concerns about the ethical conduct of this study.

Research Results
A summary of research results will be made available online at www.mamalab.ca. The ethical components of this research study have been reviewed by the Research Ethics Boards at Mount Saint Vincent University and the University of Prince Edward Island.

Consent Form for Research Participation

PARTICIPANT AUTHORIZATION
I have read or had read to me this information and authorization form. I have had the chance to ask questions. My questions have been answered to my satisfaction before moving forward. I understand the nature of the study. I also understand the potential risks. I understand that I have the right to withdraw from the study at any time without any problems. I have received a copy of the Consent Form for future reference. I freely agree to participate in this research study.

INTERVIEW
We would like to invite you for one-on-one interview. We will ask you to tell us about things such why you are involved in infant feeding, what your perceptions and experiences feeding your infant are, if or where you got information or advice about infant feeding. We will also ask about things such as how you store milk and feed it to your baby. We would like to audio record your interview in order to analyze it later on. We will transcribe it verbatim, clean from any identifiers and substitute all names with pseudonyms.

I agree to be interviewed, with audio-recording, as a part of this research study.

☐ YES ☐ NO

QUOTES
There is a possibility that we would like to quote your interview responses in publications and presentations. We will substitute your name with a pseudonym.
I agree for my interview responses, attributed with a pseudonym, to be quoted in publications and presentations.

☐ YES ☐ NO

Print name of Participant: ___________________________________

Signature: ____ Date: ______________________

STATEMENT BY PERSON PROVIDING INFORMATION ON STUDY AND OBTAINING CONSENT
I have explained the nature and demands of the research study and judge that the participant named above understands the nature and demands of the study. I have explained the nature of the consent process to the participant and judge that they understand that participation is voluntary and that they may withdraw at any time from participating.

Print name of Person Explaining Consent: ____________________________Date: ____________Signature: __________________

Version 1. June 10, 2020.