



Contextualizing online human milk sharing: Structural factors and lactation disparity among middle income women in the U.S.



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ABSTRACT

Women in the U.S. face significant structural constraints in attempting to breastfeed as recommended in the first six months of their child's life. Internet-facilitated human milk sharing is an emergent response to breastfeeding challenges. Little is known about the demographic characteristics of milk sharing donors and recipients and the ways structural factors circumscribe the biocultural context of lactation in milk sharing practices. Data regarding demographic characteristics, reproductive history, lactation history, and levels of social support and health care provider support for breastfeeding were collected via an online survey September 2013–March 2014. Statistical tests were executed to ascertain whether significant differences exist between donors and recipients. A total of 867 respondents (661 donors, 206 recipients) met the eligibility criteria for the study. Respondents were U.S. residents and primarily White, middle-class, well educated, and employed women. Both donors and recipients reported higher than the national average for household income, maternal educational attainment, breastfeeding exclusivity 0–6 months, and breastfeeding duration. Differences in lactation sufficiency and breastfeeding outcomes between donors and recipients were associated with both structural and biocultural factors. Donors reported significantly higher income, education, and support for breastfeeding from spouse/partner, other family, employers, and pediatricians. Donors also reported significantly higher rates of full term birth for child of most recent lactation. This study provides a foundation for understanding how milk sharing reflects a broader political economy of breastfeeding in the U.S.

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1. Introduction

Breastfeeding rates in the U.S. are on the rise, yet still fall short of American Academy of Pediatrics (AAP) recommendations (AAP, 2012). The national breastfeeding initiation rate was 79.2% for babies born in 2011, but exclusive breastfeeding at six months dropped to 19% (CDC, 2014). Women in the U.S. who breastfeed as recommended tend to be White, older, at least middle-income, well educated, and employed (Fein et al., 2008).

Social structural factors, such as employer accommodations for breastfeeding, paid maternity leave, and low-cost childcare help to explain differences in rates of exclusivity and duration among U.S. women (Calnen, 2007; Guendelman et al., 2009). Income constrains access to health providers who have the expertise needed to assist women as they navigate various breastfeeding challenges

(Bonuck et al., 2014; Renfrew et al., 2012; Tenfelde et al., 2011). Women with higher income and education may have greater knowledge of the benefits of breastfeeding and better access to a wider range of social support required to overcome breastfeeding barriers (Jones et al., 2011).

Political economic and sociocultural dimensions of breastfeeding are closely linked in the U.S. (Labbok, 2013). The absence of a supportive family breastfeeding culture and negative social attitudes are major barriers to breastfeeding (Smith et al., 2012) and are more pronounced in lower income communities (Baranowski et al., 1983; Guttman and Zimmerman, 2000). Positive social support for breastfeeding at multiple levels has the potential to improve breastfeeding outcomes (Sikorski et al., 2002).

Women who are highly motivated to breastfeed employ a variety of strategies to deal with challenges that may arise while attempting to feed their babies exclusively with breast milk. One emergent and controversial strategy is human milk sharing. Milk sharing may be defined as an alternative infant feeding practice in which parents seek to feed their baby with milk from a donor when mother's own milk (MOM) is limited or not available. Unlike the

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commercial market for human milk, the milk sharing described in this paper is altruistic, meaning that donors give their milk to recipients without collecting a fee. Milk sharing that is facilitated by online social networking, also called peer-to-peer milk sharing, has been on the rise in the U.S. since 2010 (Akre et al., 2011; Cassidy, 2012). There are an estimated 170 groups devoted to milk sharing on the social media site Facebook (Gribble, 2014a). Eats on Feets (eof.org) and Human Milk 4 Human Babies (hm4hb.net) host the largest online altruistic milk sharing communities and currently have a digital presence in over 50 countries with an estimated 50,000 members. These sites provide centralized virtual spaces in which recipient families in need of milk for their babies may easily connect with donors who have a surplus of milk to share.

Milk sharing has sparked controversy over risks associated with feeding infants unpasteurized donor milk, particularly in the context of Internet facilitated peer-to-peer sharing where recipients seek milk from donors with whom they may not be well-acquainted (Geraghty et al., 2013, 2011; Keim et al., 2013; Nelson, 2012). One highly publicized study of the microbial load in milk that was purchased online (Keim et al., 2013) has amplified public scrutiny of Internet facilitated milk sharing, despite the fact that the study focused on for-profit milk markets and was not executed in a way that approximates altruistic peer-to-peer milk sharing (Stuebe et al., 2014a).

The relative safety of milk sharing is often measured against infant formulas (Gribble and Hausman, 2012) and banked donor milk (Geraghty et al., 2011; Updegrave, 2013a, 2013b). Non-profit human milk banks affiliated with the Human Milk Banking Association of North America (HMBANA) aim to serve medically fragile infants whose survival often depends on pasteurized donor milk when MOM is not available (Tully, 2002; Updegrave, 2013a). They conduct systematic screening to determine donor eligibility and test, pool, and pasteurize donor milk to control for contamination and nutrient composition. Because milk banks maintain these safety protocols, they are also the only source of donor milk endorsed by the AAP (AAP, 2012) and the U.S. Federal Drug Administration (FDA, 2010).

The high cost of donor screening and pasteurization along with the demand for donor milk in neonatal intensive care units (NICU) means that banked donor milk is not a viable option for families without medical insurance or for those with babies who are not considered a medical priority (Gribble, 2013). Banked donor milk is usually dispensed only with a physician's prescription (Updegrave, 2013a). Stringent eligibility criteria for donors means that milk banks routinely face shortages of milk (Updegrave, 2013b). The recent emergence of for-profit milk banks (e.g., Prolacta Bioscience, Medolac) and other compensatory models for milk donation (e.g., Mother's Milk Cooperative) introduce new competition for potential non-profit milk bank donors (Jones, 2013). Women who engage in milk sharing typically view it as complementary to non-profit milk banking, and not a source of competition with milk banks (Gribble, 2013).

The scholarly literature on altruistic milk sharing thus far includes reports on the public health controversies (Geraghty et al., 2011; Gribble and Hausman, 2012), ethical considerations for health care providers (Gribble, 2013), risk reduction knowledge and practice (Gribble, 2014a), and donors' and recipients' philosophical and practical motivations for engaging in milk sharing (Cassidy, 2014, 2012; Gribble, 2014b, 2014c; Perrin et al., 2014; Thorley, 2012). However, several key aspects of milk sharing remain unexamined. For example, the demographic, social, and economic characteristics of those engaged in milk sharing have not been described for the U.S. Although the public health literature has clearly identified sociodemographic, structural, social support, health care provider support, and reproductive health factors that

can predict population differences in breastfeeding rates, it is unknown whether these same factors explain differences in lactation among milk sharing donors and recipients, who clearly have a shared commitment to feeding babies human milk (Gribble, 2014b, 2014c). Jones (2013) has suggested that milk sharing, in addition to carrying serious health risks and exacerbating milk bank shortages, actually undermines breastfeeding. However, we know very little about the rates of breastfeeding exclusivity and duration among milk sharing donors and recipients or the way milk sharing fits into recipients' overall infant feeding strategies. The present study aims to fill these knowledge gaps.

Critical biocultural theory in medical anthropology (Leatherman and Goodman, 2011) is used to frame the present examination of milk sharing. Anthropologists have typically viewed breastfeeding through a biocultural lens, using ethnographic research to understand patterns in the ecology of lactation physiology and maternal-child health as well as the cultural and political economic aspects of breastfeeding (Stuart-Macadam and Dettwyler, 1995). Whereas political economic perspectives of breastfeeding in anthropology use critical theory to elucidate structural inequalities that lead to disparities in health (Farmer, 1988; Kroeker and Beckwith, 2011; Van Hollen, 2011), biocultural approaches have enabled anthropologists to measure the ways in which such inequalities are expressed biologically (Casiday et al., 2004; Fouts et al., 2012; McDade and Worthman, 1998; Moffat, 2001; Panter-Brick, 1991; Panter-Brick et al., 2009). Applied to the study of breastfeeding, a critical biocultural perspective considers that social structures, social norms, and cultural beliefs affect lactation physiology and breastfeeding outcomes, and that these effects will manifest themselves differently depending upon various axes of social inequality. In this paper, we describe the extent to which the intersection of social structural and biocultural factors are associated with milk sharing in the U.S.

2. Methods

2.1. Recruitment

This study received ethics approval by the Elon University Institutional Review Board. Data were collected via an anonymous online survey September 2013–March 2014. Administrators of Facebook pages that promote altruistic milk sharing were asked to post the survey on their sites, and efforts were made to recruit a diverse sample. Respondents were eligible for the survey if they were at least 18 years of age and had ever participated in milk sharing as a donor or recipient. Respondents were instructed to complete the survey based on whether they were a donor or a recipient during their most recent milk sharing experience. The survey was only available in English and was accessible online.

2.2. Variables

2.2.1. Demographic and socioeconomic characteristics

Variables for respondents' demographic and socioeconomic characteristics included age, race/ethnicity, educational attainment, employment status, marital status, estimated annual household income, and number of adults and children in the household.

2.2.2. Reproductive and lactation histories

Respondents were asked about their reproductive histories (number of pregnancies and births) and information on the duration of their lifetime lactation, the longest duration of breastfeeding/expressing milk for a single child, and the total volume of milk given or received while milk sharing. Respondents provided the

gestational age at birth (preterm, full term), the exclusivity of breast milk given between birth and six months (exclusively breast milk, not exclusively breast milk), and duration of breastfeeding/expressing milk for their child of most recent lactation (0–3 months, 4–6 months, 7–12 months, 1–2 years, beyond 2 years).

2.2.3. Support for breastfeeding

Respondents were asked to indicate whether they received support from spouse/partner, other family, friends, mothers' breastfeeding support groups, religious/spiritual community, on-line social networks, employer, and childcare providers. They were asked to also indicate whether they received support from the following types of health care providers: lactation consultant, nurse, midwife, doula, WIC breastfeeding peer counselor, OB/GYN, and pediatrician. For each source of breastfeeding support received, respondents were asked to indicate the level of support they received using a four-point Likert Scale (strong support, some support, very little support, no support).

3. Analyses

A total of 1116 people completed the survey. Respondents were excluded from the analyses if they had donated exclusively to a milk bank, if they were seeking breast milk for anyone other than their own child, or if they were not residing in the U.S. at the time of the survey. The final sub-sample included a total of 867 respondents (661 donors, 206 recipients) from across the U.S. Data were analyzed using SAS v.9.3 software (SAS Institute, Cary NC, 2011). Table 1 contains descriptive statistics of the sub-sample characteristics.

3.1. Differences between donors and recipients

3.1.1. Socioeconomic factors

A two-independent samples *z*-test for proportions was conducted to ascertain differences in levels of educational attainment and employment status. Comparisons of educational attainment were made based on whether respondents reported having earned 'at least a college degree' or 'less than a college degree.' Employment status comparisons were made between 'employed' and 'not employed' and also between 'part-time' and 'full-time' employment.

Participants reported their estimated annual household income by selecting an income category. A poverty-to-income ratio (PIR) variable was created to account for reported household income relative to the number of persons in each household (DHHS, 2014). The midpoint of household income categories was used to calculate median household income and PIR. A two-independent samples *t*-test was used to test for a significant difference in donors' and recipients' PIR values. PIR data were explored further using the Wilcoxon Rank Sum Test (WRST), which is a nonparametric equivalent to a two-sample test that relies on the ranks of the data instead of the original values.

3.1.2. Reproductive and lactation histories

Only respondents who reported lactation following a pregnancy and childbirth were included in the analyses. Two-independent samples *t*-tests were used to ascertain significant differences in the number of pregnancies, number of births, longest duration of breastfeeding a single child, breast milk exclusivity 0–6 months, and gestational age at birth of the child of most recent lactation.

3.1.3. Social support and health care provider support

Significant differences in the levels of social support and health care provider support between donors and recipients were tested using a two-independent samples *z*-test for proportions.

Table 1
Demographic characteristics.

Variable (N)	Frequency (%)
Sex (867)	
Female	865 (99.8)
Donor	660 (76.1)
Recipient	205 (23.6)
Male	2 (0.2)
Donor	1 (0.1)
Recipient	1 (0.1)
Gender (866)	
Female	863 (99.7)
Donor	658 (76.0)
Recipient	205 (23.7)
Male	3 (0.3)
Donor	3 (0.3)
Recipient	0
Race/Ethnicity (863)	
Non-Hispanic/Latino White	782 (90.6)
Donor	599 (69.4)
Recipient	183 (21.2)
Non-Hispanic/Latino African-American	9 (1.0)
Donor	6 (0.7)
Recipient	3 (0.3)
Non-Hispanic/Latino Asian, Native Hawaiian, Pacific Islander, and/or Native American/Alaskan Native	28 (3.2)
Donor	26 (3.0)
Recipient	2 (0.2)
Hispanic/Latino White	40 (4.6)
Donor	31 (3.6)
Recipient	9 (1.0)
Hispanic/Latino African-American	2 (0.2)
Donor	1 (0.1)
Recipient	1 (0.1)
Hispanic/Latino Asian, Native Hawaiian, Pacific Islander, and/or Native American/Alaskan Native	2 (0.2)
Donor	2 (0.2)
Recipient	0
Marital Status (770)	
Married/domestic partnership/civil union	722 (93.8)
Donor	625 (81.2)
Recipient	97 (12.6)
Never Married/Divorced/Separated	48 (6.2)
Donor	35 (4.5)
Recipient	13 (1.7)

Comparisons in levels of support were made based on whether respondents reported 'at least some/strong support' or 'very little/no support' for each type of support.

4. Results

4.1. Differences between donors and recipients

4.1.1. Socioeconomic factors

Table 2 contains results of the tests used to assess differences in employment status and educational attainment. A significantly

Table 2
Educational attainment and employment status.

Variable	Donors N (%)	Recipients N (%)
Educational attainment*	N = 661	N = 206
At least a college degree	470 (71.1)	131 (63.6)
Less than a college degree	191 (28.9)	75 (36.4)
Employment Status	N = 657	N = 206
Employed	377 (57.4)	111 (53.9)
Not employed	280 (42.6)	95 (46.1)
Employment	N = 377	N = 111
Part-time	143 (37.9)	49 (44.1)
Full-time	234 (62.1)	62 (55.9)

*Difference between donors and recipients is significant ($p < 0.05$).

greater proportion of donors than recipients had at least a college degree or higher. No significant difference in employment status was found between donors and recipients, and this held true even when assessing differences based on full-time and part-time employment (p -value = 0.24).

Median donor household income was \$72,500 and median recipient household income was \$57,500. Both of these values are higher than the national median income, which was estimated at \$51,017 in 2012 (DeNavas-Walt et al., 2013). The average donor and recipient PIR both fall within the middle-income designation set by the CDC in 2013 (Table 3) (CDC, 2013). However, the median PIR for donors was significantly higher than for recipients (t -test p -value = 0.0149 and WRST p -value = 0.0011) (Fig 1).

4.1.2. Reproductive history

Basic information regarding respondents' reproductive history and gestational age at birth for child of most recent lactation is found in Table 4. There were no significant differences between groups in total number of pregnancies and births. However, a significantly higher proportion of donors than recipients carried their child of most recent lactation to full term.

Because preterm birth is often associated with Cesarean birth (Goldenberg et al., 2008), which may be a risk factor for lactation insufficiency (Augustin et al., 2014; Smith, 2007), we tested for differences in respondents' rates of C-section births for child of most recent lactation using a two-independent samples z -test. Recipients reported a higher proportion (56/179, 31.3%) of C-section births than donors (146/620, 23.5%) and this difference was significant (p -value = 0.0359).

4.1.3. Lactation history, exclusivity, and duration

Table 5 contains descriptive statistics for lactation history and milk sharing history for donors and recipients, respectively. Both the rates of duration of breastfeeding a single child and the duration of lifetime lactation were significantly higher among donors.

Breast milk exclusivity and duration for respondents' child of most recent lactation are shown in Table 6. The overall rate of exclusive breast milk feeding from birth to six months was 82% (93% among donors, and 47% among recipients). Not surprisingly, breast milk feeding exclusivity 0–6 months was significantly higher among donors. However, it is interesting that the percentage of recipients able to exclusively give their baby breast milk was almost 50%. While these rates do not reflect the relative proportions of MOM and donor milk, respondents did provide information regarding how long they either breastfed/expressed milk for their child of most recent lactation. As expected, this duration was longest among donors, with 74% continuing beyond 6 months. Recipients reported greater variability, with about 48% reporting duration of at least 0–6 months and 52% continuing beyond 6 months.

4.1.4. Social support

There were significant differences in the levels of breastfeeding support reported by donors and recipients for several sources of social support (Table 7). Recipients reported significantly lower levels of breastfeeding support from spouse/partner, other family,

Table 3

Average poverty-to-income ratio (PIR) for donors and recipients.

Respondent (N)	Mean PIR	SD	SE	IQR*
Donor (627)	3.4	2.0	0.1	1.9–4.4
Recipient (197)	3.0	2.1	0.2	1.4–3.7

*Inter quartile range (IQR): 25th percentile–75th percentile.

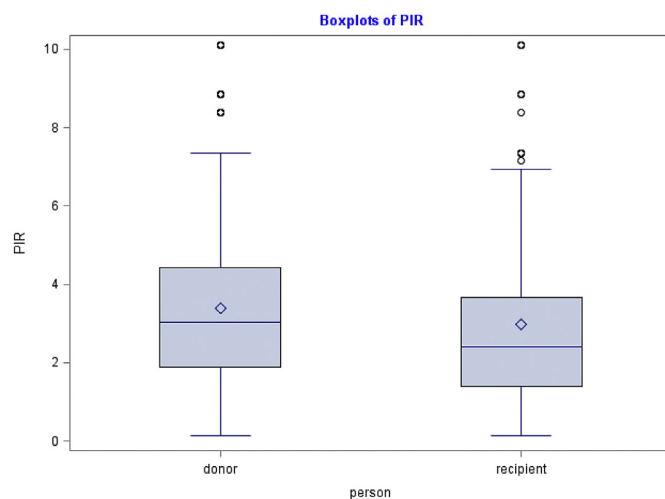


Fig. 1. Boxplots of donors' and recipients' median poverty-to-income ratio (PIR).

and employers. No significant differences were found for other sources of social support.

4.1.5. Health care provider support

Donors and recipients reported similar levels of support from all types of health care providers with the exception of pediatricians. A significantly higher proportion of donors than recipients reported that they received at least some/strong breastfeeding support from a pediatrician (p -value = 0.0030) (Table 8).

5. Discussion

Results indicate that the characteristics of mothers who engage in online milk sharing are consistent with data that describe the general population of mothers who breastfeed as recommended in the U.S. (Fein et al., 2008). However, a closer examination reveals significant variability within this group of middle-income women. Both donors and recipients reported household incomes that were higher than the national median (DeNavas-Walt et al., 2013). Yet, recipients reported a significantly lower median income. Respondents are also well educated with 69% reporting having at least a college degree, a rate that is higher than mothers in the general population with a college degree (Pew Research Center, 2013). Again, recipients reported significantly lower educational attainment than donors. Although there were no significant differences between donors and recipients with regard to employment status, breastfeeding support by employers was significantly lower among recipients. Moreover, recipients reported significantly lower

Table 4

Reproductive history and gestational age at birth for child of most recent lactation.

Reproductive history	Donors mean (SD, range)	Recipients mean (SD, range)
Respondent age in years	30.5 (5.3, 19–67)	31.5 (5.6, 21–58)
Pregnancies	2.4 (1.6, 1–13)	2.5 (2.0, 1–14)
Births	1.9 (1.0, 1–11)	1.9 (1.3, 1–10)
Gestational age at birth*	Donors N (%)	Recipients N (%)
Total	N = 619	N = 171
Full term	553 (89.3)	142 (83.0)
Preterm	66 (10.7)	29 (17.0)

*Differences between donors and recipients is significant (p -value = 0.0250).

Table 5
Lactation and milk sharing history.

Variable	Donors			Recipients		
	N	Mean (SD)	Median (IQR ^a)	N	Mean (SD)	Median (IQR ^a)
Lifetime lactation in months**	659	26.2 (24.0)	20.0 (12.0–34.0)	194	20.4 (26.0)	10.0 (5.0–26.0)
Longest duration breastfeeding/expressing milk for a single child (months)**	660	17.7 (12.4)	15.0 (10.0–24.0)	191	12.9 (14.4)	8.0 (4.0–17.0)
Average age of child of most recent lactation (months)	640	4.7 (5.0)	3.0 (2.0–6.0)	193	7.1 (6.2)	5.0 (2.0–10.0)
Average number of milk sharing donors	–	–	–	206	7.5 (8.2)	4.3 (2.0–10.0)
Average number of milk sharing recipients	661	3.1 (6.7)	2.0 (1.0–3.5)	–	–	–
Total volume of milk received (oz)	–	–	–	206	2833.5 (7744.3)	710 (250.0–3000.0)
Total volume of milk donated (oz)	656	1356.5 (4518.5)	400.0 (200.0–1000.0)	–	–	–

** t-test and WRST p-values < 0.0001.

^a Inter quartile range (IQR): lower quartile is the 25th percentile and higher quartile is the 75th percentile.

proportions of spousal/partner support, other family support, and pediatrician support for breastfeeding.

Despite the fact that recent epidemiological trends, such as population-wide increases in obesity, metabolic disorders, mental illness, and mood disorders, appear to have a substantial impact on lactation physiology and breastfeeding outcomes (Mehta et al., 2011; Stuebe et al., 2014a,2014b), structural inequalities are still considered the greatest barrier to breastfeeding. In the U.S. the ability to breastfeed as recommended by the AAP is strongly tied to social status and privilege (McCarter-Spaulding, 2008; Turner and Norwood, 2013). For example, returning to work is associated with breastfeeding cessation in the U.S. (Kimbrow, 2006). The types of jobs women have and the timing of a return to work postpartum, rather than employment status, may be more important in the association between work and breastfeeding outcomes (Mirkovic et al., 2014). One study found that low-income women who were employed in administrative and manual labor occupations were more likely to end breastfeeding than women working in service jobs and career professionals (Kimbrow, 2006). Employer and co-worker attitudes and safe, sanitary places for breastfeeding/expressing milk affect the extent to which mothers successfully combine work and breastfeeding (Bai and Wunderlich, 2013; Tsai, 2014a). Paid maternity and family leave are also associated with better breastfeeding outcomes (Baker and Milligan, 2008; Shepherd-Banigan and Bell, 2014). Similar variations between donors and recipients in occupation type and leave policies may account for some of the differences in employer support that we observed in the data.

Table 6
Breast milk exclusivity and duration for child of most recent lactation.

Breast milk feeding exclusivity 0–6 months*	Donors (N = 600)	Recipients (N = 170)
	Frequency (%)	Frequency (%)
Exclusively breast milk	560 (93.3)	79 (46.5)
Not exclusively breast milk:		
Mostly breast milk, some formula	37 (6.2)	59 (34.7)
Equal breast milk and formula	1 (0.2)	13 (7.7)
Mostly formula, some breast milk	1 (0.2)	18 (10.6)
Exclusively formula	1 (0.2)	1 (0.6)
Duration of breastfeeding/expressing milk birth to >2 years	Donors (N = 517)	Recipients (N = 161)
	Frequency (%)	Frequency (%)
0–3 months	45 (8.7)	37 (23.0)
4–6 months	91 (17.6)	40 (24.8)
7–12 months	128 (24.8)	36 (22.4)
1–2 years	213 (41.2)	39 (24.2)
Beyond 2 years	40 (7.7)	9 (5.6)

*Difference between donors and recipients is statistically significant (p-value < 0.0001).

While the decision to breastfeed is highly personal, the ability to enact personal breastfeeding goals is subject to numerous external influences. Social norms influence breastfeeding decisions, practices, and outcomes and are not easily disentangled from social structural factors (Li et al., 2007; Smith et al., 2012). In a social ecological model of breastfeeding, social support at multiple levels - individual, interpersonal, community, organizational, and public policy - is integral to women's ability to reach recommended breastfeeding exclusivity and duration (Dunn et al., 2014; Tiedje et al., 2002). Women with higher socioeconomic status are more likely to have strong spouse/partner and familial support for breastfeeding, and being a supportive spouse/partner and family member has become a marker of social class in the U.S. (Tomori, 2009, 2014). Male spousal/partner support (Arora et al., 2000; Bar-Yam and Darby, 1997; Brown and Davies, 2014; Rempel and Rempel, 2011; Sikorski et al., 2002) strongly influences a mother's decision to breastfeed, to breastfeed exclusively until six months, and to breastfeed longer. Studies have shown that support from other family members is quite influential (Dunn et al., 2014; Grassley and Eschiti, 2008; Odom et al., 2014). There is also a positive interaction between spouse/partner breastfeeding support, employment status, employer breastfeeding support and breastfeeding outcomes (Tsai, 2014b), which is reflected in our study findings.

Health care provisioning is a critical component to a mother's overall breastfeeding support system (Bonuck et al., 2014; Bunik et al., 2014; Stuebe, 2014). Pediatricians are particularly

Table 7
Social support for breastfeeding.

Source of support	Respondent (N)	At least some support or strong support frequency (%)	Very little or no support frequency (%)
Spouse/partner*	Donor (636)	627 (98.6)	9 (1.4)
	Recipient (191)	183 (95.8)	8 (4.2)
Other family members*	Donor (641)	586 (91.4)	55 (8.6)
	Recipient (189)	163 (86.2)	26 (13.8)
Friends	Donor (627)	580 (92.5)	47 (7.5)
	Recipient (182)	173 (95.1)	9 (4.9)
Employer**	Donor (346)	292 (84.4)	54 (15.6)
	Recipient (88)	60 (68.2)	28 (31.8)
Child care provider	Donor (228)	199 (87.3)	29 (12.7)
	Recipient (51)	40 (78.4)	11 (21.6)
Breastfeeding mothers' group	Donor (413)	399 (96.6)	14 (3.4)
	Recipient (141)	136 (96.5)	5 (3.5)
Religious/Spiritual group	Donor (142)	90 (63.4)	52 (36.6)
	Recipient (47)	35 (74.5)	12 (25.5)
Online breastfeeding support	Donor (572)	555 (97.0)	17 (3.0)
	Recipient (167)	159 (95.2)	8 (4.8)

Difference between donors and recipients is statistically significant: *p < 0.05; **p < 0.001.

Table 8
Health care provider support for breastfeeding.

Source of support	Respondent (N)	At least some support frequency (%)	Very little or no support frequency (%)
Lactation consultant	Donor (506)	423 (83.6)	83 (16.4)
	Recipient (179)	149 (83.2)	30 (16.8)
Nurse	Donor (467)	305 (65.3)	162 (34.7)
	Recipient (147)	94 (63.9)	53 (36.1)
Midwife	Donor (276)	214 (77.5)	62 (22.5)
	Recipient (89)	69 (77.5)	20 (22.5)
Doula	Donor (181)	139 (76.8)	42 (23.2)
	Recipient (72)	57 (79.2)	15 (20.8)
WIC breastfeeding peer counselor	Donor (135)	86 (63.7)	49 (36.3)
	Recipient (70)	47 (67.1)	23 (32.9)
Obstetrician/gynecologist	Donor (421)	262 (62.2)	159 (37.8)
	Recipient (126)	69 (54.8)	57 (45.2)
Pediatrician*	Donor (518)	373 (72.0)	145 (28.0)
	Recipient (161)	96 (59.6)	65 (40.4)

*Difference between donors and recipients is statistically significant ($p = 0.0030$).

instrumental, because they are responsible for monitoring the health, growth, and development of breastfed infants (Handa and Schanler, 2013). They may be among the first to identify issues associated with breastfeeding, using an infant's weight gain and stooling/voiding patterns as an initial proxy for lactation sufficiency (Geraghty et al., 2008). Yet, pediatricians face many challenges when attending to breastfeeding mothers as patients. Studies have identified substantial weaknesses in pediatricians' knowledge of breastfeeding, clinical lactation skills (i.e., evaluating latch, positioning, milk transfer, nipple pain and damage, using breastfeeding technology, and dealing with breast infections), and confidence in providing support to breastfeeding dyads (Feldman-Winter et al., 2008; Freed et al., 1995; Hillebrand and Larsen, 2002; Schanler et al., 1999; Taveras et al., 2004; Walton and Edwards, 2002).

Study results indicate that breastfeeding support from pediatricians was significantly lower among recipients. These data are consistent with other studies that have demonstrated how low perceived pediatrician support for breastfeeding is associated with poorer breastfeeding outcomes (Feldman-Winter et al., 2008; Ramakrishnan et al., 2014; Taveras et al., 2004). Recipients are breastfeeding mothers who often present with very complicated lactation issues (Gribble, 2014c; Perrin et al., 2014), which are beyond the scope of most pediatricians' expertise (Freed et al., 1995; Labarere et al., 2005). Women with lower levels of education and income have limited access to pediatricians who can provide specialized lactation services and may be less able to effectively advocate for their decision to breastfeed with an unsupportive provider (Bonuck et al., 2014; Renfrew et al., 2012; Tenfelde et al., 2011). These findings add to the growing literature calling for greater attention to pediatricians' lactation education and training and ability to effectively coordinate care for breastfeeding dyads that are experiencing difficulties.

When considering the biocultural dimensions of breastfeeding, a woman's reproductive history, perinatal health, and birth experience are particularly relevant (Mannel et al., 2013). For instance, compared with breastfeeding mothers of healthy term babies, mothers of preterm infants who exclusively express their milk are more likely to have insufficient milk production (Hill et al., 2007), which is the most common reason for breastfeeding cessation (Almqvist-Tangen et al., 2012; Arora et al., 2000). Preterm infants have more post-partum health complications and hospital readmissions related to insufficient milk intake (Morton et al., 2013). Preterm births are often associated with medically indicated Cesarean sections (Goldenberg et al., 2008) which may result in delayed initiation of breastfeeding and/or breast milk expression, delayed onset of lactation, maternal-infant separation, early

supplementation with formula, and breastfeeding cessation (Augustin et al., 2014; Smith, 2007).

Social inequality contributes to higher rates of preterm birth in the U.S. Employer family leave policies, education level, and income are all associated with preterm birth (Goldenberg et al., 2008; Rossin, 2011). Moreover, initiation and continuation of breastfeeding among mothers with preterm infants in NICUs are highly correlated with education and income, marital status, spousal and partner support, other family support, and support by health providers with lactation expertise (Alves et al., 2013; Lessen and Crivelli-Kovach, 2007; Smith et al., 2006). Hospital practices that attend to the special needs of preterm infants and their mothers can mean the difference between lactation sufficiency and insufficiency (Brett et al., 2011; Morton et al., 2013), but not all families have access to such care.

This intersection of structural inequalities, differences in social support, and biocultural dimensions of lactation physiology resonates with our milk sharing data. The preterm birth rate was significantly higher among recipients, who reported a higher preterm birth rate than the 2012 national average (Hamilton et al., 2013). Similarly, the C-section rate of donors (23.5%) was substantially lower than the 2012 national average (32.8%), whereas recipients reported a C-section rate of 31.3% (Hamilton et al., 2013).

Today in the United States the pressure to breastfeed is high, but the structural and social support systems needed to foster breastfeeding success are weak. Stuebe et al. (2014b: 10) describe catastrophic breastfeeding crises, many of which lead to early, unwanted breastfeeding cessation, as "lactastrophes." Breastfeeding difficulties, low milk supply, early supplementation, and unwanted breastfeeding cessation are among the most common reasons women in the U.S. wean earlier than planned (Stuebe et al., 2014b). These same reasons fuel the demand for donor milk online (Cassidy, 2012; Gribble, 2014c; Perrin et al., 2014; Thorley, 2012). Our data suggest that Internet milk sharing operates within a hierarchy of social privilege that is largely constrained to an exceptional group of middle-income women who are highly motivated to breastfeed. While structural factors are associated with lactation insufficiency among recipients, these same women were able to rebound from lactastrophes, achieving high rates of breast milk exclusivity and duration in ways that are not possible without milk sharing.

5.1. Limitations

Some caveats must be considered when interpreting these data. The survey was only offered in English, which restricted the potential respondent pool. There were nearly three times as many donors who responded to the survey as recipients. It would have been ideal to have equal numbers of donor and recipient responses, because it may be more difficult to detect significant differences between populations when one sample group has a substantially smaller number. The statistical tests used in these analyses appropriately controlled for the differences in sample size. The differences identified between donors and recipients must be narrowly interpreted as statistical associations with, and not necessarily independent causes of, differences in milk supply and breastfeeding exclusivity and duration. Associations between perceptions of breastfeeding support and lactation outcomes must also be interpreted with some caution, as the data on social support were gathered retrospectively; in other words, lactation insufficiency may have negatively biased respondents' perceptions of social support *post hoc*.

Online milk sharing is a highly complex bio-cultural-technological phenomenon. The pathways that lead to breastfeeding success or cessation are extremely varied and multifaceted. Not all breastfeeding practices follow a linear trajectory, and the

patterns observed in our data may not apply to all families who choose milk sharing as an infant feeding choice. Our study is valuable primarily because it adds to our understanding of who is engaged in milk sharing, factors that distinguish breastfeeding mothers with an oversupply and undersupply of milk, and how milk sharing may reflect broader societal trends in breastfeeding. It provides new evidence with which to better understand how these recipients use donor milk in their infant feeding practices. Yet, it is important to note that these data are merely a cross-sectional snapshot of a dynamic, rapidly evolving practice, and they do not necessarily capture the full range of factors or experiences that propel families into milk sharing.

6. Future directions

Milk sharing is an embodied practice that inspires new thinking about the social life of human milk, the technologies that facilitate its production and flow, and the philosophies of trust that connect mothers, babies, and others (Cassidy, 2014). The present study not only fills a knowledge gap in the milk sharing literature but also generates some compelling questions for further research: Does being a breast milk donor influence a woman's breastfeeding duration? Are there aspects of milk sharing and social networking that constrain the demographic diversity of milk sharing communities? Are other groups engaged in milk sharing and what does that look like? In what ways are various forms of breastfeeding support qualitatively different between donors and recipients? How has this support, or lack thereof, helped or hindered breastfeeding in milk sharing families? Additionally, our data indicate that there are people involved in milk sharing who are transgender and/or non-gestational parents. Further research into the significance of milk sharing in mothering, fathering, and grandparenting practices in these families is needed.

Stearns (2009) has called for breastfeeding studies that are grounded in embodied practices as a means to contribute to breastfeeding policy, public health research, and breastfeeding advocacy. Anthropologists are poised to answer this call by conducting research that gives insight to the ways individuals' milk sharing experiences reflect connection to their own bodies and babies, to other families, to new forms of technology, and to society. These issues are best explored through ethnographically informed investigations of milk sharing.

Theorizing the critical biocultural dimensions of breastfeeding and milk sharing requires careful examination of bodies and how cultural practices, social interactions, and institutions bear influence on them. Our study offers a new perspective on milk sharing, one that moves beyond simple discourses of risk and disease. By revealing structural inequalities of lactation that are veiled by high rates of breastfeeding overall, it challenges us to consider the ways in which milk sharing among these middle-income women reflects a broader political economy of breastfeeding in the U.S. Finally, it provides signposts for potential areas where greater structural support for breastfeeding may be improved.

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References

- AAP (American Academy of Pediatrics), 2012. Breastfeeding and the use of human milk. *Pediatrics* 129, 2011–3552.
- Akre, J.E., Gribble, K.D., Minchin, M., 2011. Milk sharing: from private practice to public pursuit. *Int. Breastfeed. J.* 6, 1–3.
- Almqvist-Tangen, G., Bergman, S., Dahlgren, J., Roswall, J., Alm, B., 2012. Factors associated with discontinuation of breastfeeding before 1 month of age. *Acta Paediatr.* 101, 55–60.
- Alves, E., Rodrigues, C., Fraga, S., Barros, H., Silva, S., 2013. Parents' views on factors that help or hinder breast milk supply in neonatal care units: systematic review. *Arch. Dis. Child. Fetal Neonatol.* 98, F511–F517.
- Arora, S., McJunkin, C., Wehrer, J., Kuhn, P., 2000. Major factors influencing breastfeeding rates: mother's perception of father's attitude and milk supply. *Pediatrics* 106, E67.
- Augustin, A.L., Donovan, K., Lozano, E.A., Massucci, D.J., Wohlgenuth, F., 2014. Still nursing at 6 months: a survey of breastfeeding mothers. *Am. J. Matern. Child Nurs.* 39, 50–55.
- Bai, Y., Wunderlich, S.M., 2013. Lactation accommodation in the workplace and duration of exclusive breastfeeding. *J. Midwifery Womens Health* 58, 690–696.
- Baker, M., Milligan, K., 2008. Maternal employment, breastfeeding, and health: evidence from maternity leave mandates. *J. Health Econ.* 27, 871–887.
- Bar-Yam, N.B., Darby, L., 1997. Fathers and breastfeeding: a review of the literature. *J. Hum. Lact.* 13, 45–50.
- Baranowski, T., Bee, D.E., Rassin, D.K., Richardson, C.J., Brown, J.P., Guenther, N., Nader, P.R., 1983. Social support, social influence, ethnicity and the breastfeeding decision. *Soc. Sci. Med.* 17, 1599–1611.
- Bonuck, K., Stuebe, A., Barnett, J., Labbok, M.H., Fletcher, J., Bernstein, P.S., 2014. Effect of primary care intervention on breastfeeding duration and intensity. *Am. J. Public Health* 104, S119–S127.
- Brett, J., Staniszevska, S., Newburn, M., Jones, N., Taylor, L., 2011. A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants. *BMJ Open* 1, e000023.
- Brown, A., Davies, R., 2014. Fathers' experiences of supporting breastfeeding: challenges for breastfeeding promotion and education. *Matern. Child Nutr.* 10 (4), 510–526. <http://dx.doi.org/10.1111/mcn.12129> (epub ahead of print).
- Bunik, M., Dunn, D.M., Watkins, L., Talmi, A., 2014. Trifecta approach to breastfeeding clinical care and the integrated mental health model. *J. Hum. Lact.* 30, 143–147.
- Calnen, G., 2007. Paid maternity leave and its impact on breastfeeding in the United State: an historic, economic, political, and social perspective. *Breastfeed. Med.* 2, 34–44.
- Casiday, R.E., Wright, C.M., Panter-Brick, C., Parkinson, K.N., 2004. Do early infant feeding patterns relate to breast-feeding continuation and weight gain? Data from a longitudinal cohort study. *Eur. J. Clin. Nutr.* 58, 1290–1296.
- Cassidy, T.M., 2012. Making “milky matches”: globalization, maternal trust, and “lactivist” online networking. *J. Mother. Initiative* 3, 226–240.
- Cassidy, T.M., 2014. Mothers, milk, and money: maternal corporeal generosity, social psychological trust, and value in human milk exchange. *J. Mother. Initiative* 3, 96–111.
- CDC (Centers for Disease Control and Prevention), 2013. CDC Health Disparities and Inequalities Report – United States 2013. *MMWR*, pp. 1–189. Suppl. 3.
- CDC (Centers for Disease Control and Prevention), 2014. Breastfeeding Report Card – United States, 2014. Retrieved from <http://www.cdc.gov/breastfeeding/pdf/2014breastfeedingreportcard.pdf> (accessed 16.9.14).
- DeNavas-Walt, C., Proctor, B.D., Smith, J.C., 2013. Income, Poverty, and Health Insurance Coverage in the United States: 2012. U.S. Census Bureau, Current Population Reports, P60–245. U.S. Washington, DC. Retrieved from <http://www.census.gov/prod/2013pubs/p60-245.pdf> (accessed 27.3.14).
- DHHS (Department of Health and Human Services), 2014. 2014 Poverty Guidelines. Department of Health and Human Services under the authority of 42 U.S.C. 9902(2). Retrieved from <http://aspe.hhs.gov/poverty/14poverty.cfm> (accessed 25.3.14).
- Dunn, R.L., Kalich, K.A., Henning, M.J., Fedrizzi, R., 2014. Engaging field-based professionals in a qualitative assessment of barriers and positive contributors to breastfeeding using the social ecological model. *Matern. Child Health J.* 1–11. <http://dx.doi.org/10.1007/s10995-014-1488-x> (epub ahead of print).
- Farmer, P., 1988. Bad blood, spoiled milk: bodily fluids as moral barometers in rural Haiti. *Am. Ethnol.* 15, 62–83.
- FDA (Federal Drug Administration), 2010. Use of donor human milk. Retrieved from <http://www.fda.gov/ScienceResearch/SpecialTopics/PediatricTherapeuticsResearch/ucm235203.htm> (accessed 7.1.14).
- Fein, S.B., Labiner-Wolfe, J., Shealy, K.R., Li, R., Chen, J., Grummer-Strawn, L.M., 2008. Infant feeding practices study II: study methods. *Pediatrics* 122, S28–S35.
- Feldman-Winter, L.B., Schanler, R.J., O'Connor, K.G., Lawrence, R.A., 2008. Pediatricians and the promotion and support of breastfeeding. *Arch. Pediatr. Adolesc. Med.* 162, 1142–1149.
- Fouts, H.N., Hewlett, B.S., Lamb, M.E., 2012. A biocultural approach to breastfeeding interactions in Central Africa. *Am. Anthropol.* 114, 123–136.
- Freed, G.L., Clark, S.J., Sorenson, J., Lohr, J.A., Cefalo, R., Curtis, P., 1995. National assessment of physicians' breast-feeding knowledge, attitudes, training, and experience. *J. Am. Med. Assoc.* 273, 472–476.
- Geraghty, S.R., Heier, J.E., Rasmussen, K.M., 2011. Got milk? Sharing human milk via the internet. *Public Health Rep.* 126, 161–164.

- Geraghty, S.R., McNamara, K.A., Dillon, C.E., Hogan, J.S., Kwiek, J.J., Keim, S.A., 2013. Buying human milk via the internet: just a click away. *Breastfeed. Med.* 8, 474–478.
- Geraghty, S.R., Riddle, S.W., Shaikh, U., 2008. The breastfeeding mother and the pediatrician. *J. Hum. Lact.* 24, 335–339.
- Goldenberg, R.L., Culhane, J.F., Iams, J.D., Romero, R., 2008. Epidemiology and causes of preterm birth. *Lancet* 371, 75–84.
- Grassley, J., Eschiti, V., 2008. Grandmother breastfeeding support: what do mothers need and want? *Birth* 35, 329–335.
- Gribble, K.D., 2013. Peer-to-peer milk donors' and recipients' experiences and perceptions of donor milk banks. *J. Obstet. Gynecol. Neonatal Nurs.* 42, 451–461.
- Gribble, K.D., 2014a. Perception and management of risk in internet-based peer-to-peer milk-sharing. *Early Child Dev. Care* 184, 84–98.
- Gribble, K.D., 2014b. "I'm happy to be able to help:" why women donate milk to a peer via internet-based milk sharing networks. *Breastfeed. Med.* 9, 251–256.
- Gribble, K.D., 2014c. "A better alternative": why women use peer-to-peer shared milk. *Breastfeed. Rev.* 22, 11–21.
- Gribble, K.D., Hausman, B.L., 2012. Milk sharing and formula feeding: infant feeding risks in comparative perspective? *Australas. Med. J.* 5, 275–283.
- Guendelman, S., Kosa, J.L., Pearl, M., Graham, S., Goodman, J., Kharrazi, M., 2009. Juggling work and breastfeeding: effects of maternity leave and occupational characteristics. *Pediatrics* 123, e38–e46.
- Guttman, N., Zimmerman, D.R., 2000. Low-income mothers' views on breastfeeding. *Soc. Sci. Med.* 50, 1457–1473.
- Hamilton, B.E., Osterman, M.J.K., Curtin, S.C., Mathews, T.J., 2013. Births: final data for 2012. *Natl. Vital Stat. Rep.* 62, 1–87.
- Handa, D., Schanler, R.J., 2013. Role of the pediatrician in breastfeeding management. *Pediatr. Clin. N. Am.* 60, 1–10.
- Hill, P.D., Aldag, J.C., Zinaman, M., Chatterton, R.T., 2007. Predictors of preterm infant feeding methods and perceived insufficient milk supply at week 12 postpartum. *J. Hum. Lact.* 23, 32–38.
- Hillebrand, K.M., Larsen, P.G., 2002. Effect of an educational intervention about breastfeeding knowledge, confidence, and behaviors of pediatric resident physicians. *Pediatrics* 110, 1–7.
- Jones, F., 2013. Milk sharing: how it undermines breastfeeding. *Breastfeed. Rev.* 21, 21–25.
- Jones, J.R., Kogan, M.D., Singh, G.K., Dee, D.L., Grummer-Strawn, L.M., 2011. Factors associated with exclusive breastfeeding in the United States. *Pediatrics* 128, 1117–1125.
- Keim, S.A., Hogan, J.S., McNamara, K.A., Gudimetla, V., Dillon, C.E., Kwiek, J.J., Geraghty, S.R., 2013. Microbial contamination of human milk purchased via the internet. *Pediatrics* 132, e1227–e1235.
- Kimbro, R.T., 2006. On-the-job moms: work and breastfeeding initiation and duration for a sample of low-income women. *Matern. Child Health J.* 10, 19–26.
- Kroeker, L., Beckwith, A., 2011. Safe infant feeding in lesotho in the era of HIV/AIDS. *Ann. Anthropol. Pract.* 35, 50–66.
- Labaree, J., Gelbert-Baudino, N., Ayral, A.-S., Duc, C., Berchotteau, M., Bouchon, N., Schelstraete, C., Vittoz, J.-P., Francois, P., Pons, J.-C., 2005. Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: a prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics* 115, e139–146.
- Labbok, M.H., 2013. Breastfeeding: population-based perspectives. *Pediatr. Clin. North Am.* 60, 11–30.
- Leatherman, T., Goodman, A.H., 2011. Critical biocultural approaches in medical anthropology. In: Singer, M., Erickson, P. (Eds.), *A Companion to Medical Anthropology*. Wiley-Blackwell, Malden, MA, pp. 29–48.
- Lessen, R., Crivelli-Kovach, A., 2007. Prediction of initiation and duration of breastfeeding for neonates admitted to the neonatal intensive care unit. *J. Perinat. Neonatal Nurs.* 21, 256–266.
- Li, R., Rock, V.J., Grummer-Strawn, L., 2007. Changes in public attitudes toward breastfeeding in the United States, 1999–2003. *J. Am. Diet. Assoc.* 107, 122–127.
- McCarter-Spaulding, D., 2008. Is breastfeeding fair? Tensions in feminist perspectives on breastfeeding and the family. *J. Hum. Lact.* 24, 206–212.
- McDade, T.W., Worthman, C.M., 1998. The weaning's dilemma reconsidered: a biocultural analysis of breastfeeding ecology. *J. Dev. Behav. Pediatr.* 19, 286–299.
- Mannel, R., Martens, P., Walker, M., 2013. Core Curriculum for Lactation Consultant Practice, third ed. Jones & Bartlett Learning, Burlington, MA.
- Mehta, U.J., Siega-Riz, A.M., Herring, A.H., Adair, L.S., Bentley, M.E., 2011. Maternal obesity, psychological factors, and breastfeeding initiation. *Breastfeed. Med.* 6, 369–376.
- Mirkovic, K.R., Perrine, C.G., Scanlon, K.S., Grummer-Strawn, L.M., 2014. In the United States, a mother's plans for infant feeding are associated with her plans for employment. *J. Hum. Lact.* 30, 292–297.
- Moffat, T., 2001. A biocultural investigation of the weaning's dilemma in Kathmandu, Nepal: do universal recommendations for weaning practices make sense? *J. Biosoc. Sci.* 33, 321–338.
- Morton, J., Hall, J.Y., Pessl, M., 2013. Five steps to improve bedside breastfeeding care. *Nurs. Womens Health* 17, 478–488 (Arora et al., 2000).
- Nelson, R., 2012. Breast milk sharing is making a comeback, but should it? *Am. J. Nurs.* 112, 19–20.
- Odom, E.C., Li, R., Scanlon, K.S., Perrine, C.G., Grummer-Strawn, L., 2014. Association of family and health care provider opinion on infant feeding with mother's breastfeeding decision. *J. Acad. Nutr. Diet.* 117 (8), 1203–1207.
- Panther-Brick, C., 1991. Lactation, birth spacing and maternal work-loads among two castes in rural Nepal. *J. Biosoc. Sci.* 23, 137–154.
- Panther-Brick, C., Lunn, P.G., Langford, R.M., Maharjan, M., Manandhar, D.S., 2009. Pathways leading to early growth faltering: an investigation into the importance of mucosal damage and immunostimulation in different socio-economic groups in Nepal. *Br. J. Nutr.* 101, 558–567.
- Perrin, M.T., Goodell, L.S., Allen, J.C., Fogelman, A., 2014. A mixed-methods observational study of human milk sharing communities on facebook. *Breastfeed. Med.* 9, 128–134.
- Pew Research Center, 2013. Long-term Trend Accelerates since Recession: Record Share of New Mothers Are College Educated. Retrieved from <http://www.pewsocialtrends.org/2013/05/10/record-share-of-new-mothers-are-college-educated/> (accessed on 16.6.14.).
- Ramakrishnan, R., Oberg, C.N., Kirby, R.S., 2014. The association between maternal perception of obstetric and pediatric care providers' attitudes and exclusive breastfeeding outcomes. *J. Hum. Lact.* 30, 80–87.
- Rempel, L.A., Rempel, J.K., 2011. The breastfeeding team: the role of involved fathers in the breastfeeding family. *J. Hum. Lact.* 27, 115–121.
- Renfrew, M.J., McCormick, F.M., Wade, A., Quinn, B., Dowswell, T., 2012. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst. Rev.* 5, 1–204. <http://dx.doi.org/10.1002/14651858.CD001141.pub4>.
- Rossin, M., 2011. The effects of maternity leave on children's birth and infant health outcomes in the United States. *J. Health Econ.* 30, 221–239.
- Schanler, R.J., O'Connor, K.G., Lawrence, R.A., 1999. Pediatricians' practices and attitudes regarding breastfeeding promotion. *Pediatrics* 103, E35.
- Shepherd-Banigan, M., Bell, J.F., 2014. Paid leave benefits among a national sample of working mothers with infants in the United States. *Matern. Child Health J.* 18, 286–295.
- Sikorski, J., Renfrew, M.J., Pindoria, S., Wade, A., 2002. Support for breastfeeding mothers. *Cochrane Database Syst. Rev.* 1, 1–44. <http://dx.doi.org/10.1002/14651858.CD001141>.
- Smith, J.R., Jamerson, P.A., Bernaix, L.W., Schmidt, C.A., Seiter, L., 2006. Fathers' perceptions of supportive behaviors for the provision of breast milk to premature infants. *Adv. Neonatal Care* 6, 341–348.
- Smith, L.J., 2007. Impact of birthing practices on the breastfeeding byad. *J. Midwifery Womens Health* 52, 621–630.
- Smith, P.H., Hausman, B.L., Labbok, M. (Eds.), 2012. *Beyond Health, beyond Choice: Breastfeeding Constraints and Realities*. Rutgers University Press, New Brunswick, NJ.
- Stearns, C.A., 2009. The work of breastfeeding. *Womens Stud. Q.* 37, 63–80.
- Stuart-Macadam, P., Dettwyler, K.A. (Eds.), 1995. *Breastfeeding: Biocultural Perspectives*. Aldine de Gruyter Press, New York, NY.
- Stuebe, A.M., 2014. Enabling women to achieve their breastfeeding goals. *Obstet. Gynecol.* 123 (3), 643–652. <http://dx.doi.org/10.1097/AOG.0000000000000142> (epub ahead of print).
- [E-letter] Stuebe, A.M., Gribble, K.D., Palmquist, A.E.L., January 3, 2014a. Differences between online milk sales and peer-to-peer sharing. *Pediatrics* (available online).
- Stuebe, A.M., Horton, B.J., Chetwynd, E., Watkins, S., Grewen, K., Meltzer-Brody, S., 2014b. Prevalence and risk factors for early, undesired weaning attributed to lactation dysfunction. *J. Womens Health* 23 (5), 404–412. <http://dx.doi.org/10.1089/jwh.2013.4506> (epub ahead of print).
- Taveras, E.M., Li, R., Grummer-Strawn, L., Richardson, M., Marshall, R., Régo, V.H., Miroshnik, I., Lieu, T.A., 2004. Opinions and practices of clinicians associated with continuation of exclusive breastfeeding. *Pediatrics* 113, e283–e290.
- Tenfelde, S., Finnegan, L., Hill, P.D., 2011. Predictors of breastfeeding exclusivity in a WIC sample. *J. Obstet. Gynecol. Neonatal Nurs.* 40, 179–189.
- Thorley, V., 2012. Mothers' experiences of sharing breastfeeding or breastmilk, part 2: the early 21st century. *Nurs. Rep.* 2, 4–12.
- Tiedje, L.B., Schiffman, R., Omar, M., Wright, J., Buzzitta, C., McCann, A., Metzger, S., 2002. An ecological approach to breastfeeding. *J. Matern. Child Nurs.* 27, 154–161.
- Tomori, C., 2014. *Nighttime Breastfeeding: An American Cultural Dilemma*. Berghahn Books, New York, NY.
- Tomori, C., 2009. Breastfeeding as men's "kin work" in the United States. *Phoebe* 21, 31–44.
- Tsai, S.-Y., 2014a. Employee perception of breastfeeding-friendly support and benefits of breastfeeding as a predictor of intention to use breast-pumping breaks after returning to work among employed mothers. *Breastfeed. Med.* 9, 16–23.
- Tsai, S.-Y., 2014b. Influence of partner support on an employed mother's intention to breastfeed after returning to work. *Breastfeed. Med.* 9, 222–230.
- Tully, M.R., 2002. Recipient prioritization and use of human milk in the hospital setting. *J. Hum. Lact.* 18, 393–396.
- Turner, P.K., Norwood, K., 2013. "I had the luxury...": organizational breastfeeding support as privatized privilege. *Hum. Relat.* 67, 849–874.
- Updegrave, K.H., 2013a. Nonprofit human milk banking in the United States. *J. Midwifery Womens Health* 58, 1542–2011.
- Updegrave, K.H., 2013b. Donor human milk banking: growth, challenges, and the role of HMBANA. *Breastfeed. Med.* 8, 435–437.
- Van Hollen, C., 2011. Breast or bottle? HIV-positive women's responses to global health policy on infant feeding in India. *Med. Anthropol. Q.* 25, 499–518.
- Walton, D.M., Edwards, M.C., 2002. Nationwide survey of pediatric residency training in newborn medicine: preparation for primary care practice. *Pediatrics* 110, 1081–1087.