"There's a Little Bit of Tension There:" Perspectives of Mothers and Early Childhood Educators on Breastfeeding in Child Care Centers

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Ethical standards disclosure: This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the University of Pittsburgh Human Research Protection Office. Verbal informed consent was obtained from all participants. Verbal consent was witnessed and formally recorded. The analysis and partial results of this paper were presented as a poster at the 2023 Association of Women's Health, Obstetric, and Neonatal Nurses Convention (Dieterich R, Shope T, Glasser M, Harpel C, Demirci J. (June 2023). *Maternal and childcare provider views of lactation support in childcare centers.* New Orleans, LA).

ABSTRACT

Objective:

To explore mothers' and early childhood (EC) educators' experiences of breastfeeding/breast milk provision and breastfeeding support in child care centers (CCCs) in the United States (U.S.).

Design:

We conducted one-time, semi-structured phone interviews with mothers and EC educators to examine perceptions of support, accommodations, and barriers to breastfeeding in CCCs. We administered a background survey to assess participant characteristics and quantify perceived degree of breastfeeding support in the workplace (mothers) and CCCs (mothers and EC educators).

Setting: U.S.-based CCCs

Participants: 50 working mothers using CCCs for their infants and 22 EC educators

Results: Interview themes and background surveys reflected neutral feelings toward breastfeeding support received (mothers) and provided (EC educators) in CCCs. Maternal expectations for breastfeeding support in CCCs were generally low; workplace and social support for breastfeeding were perceived as the most important factors impacting breastfeeding. EC educators' capacity to offer breastfeeding support was constrained by CCC infant feeding regulations, inadequate breastfeeding training, and time limitations. Tensions arose when mothers attempted to manage low milk supply at the CCC level by requesting EC educators to individualize feeding or milk storage practices for their infant.

Conclusions:

Breastfeeding efforts of working mothers are undermined in multiple settings, including the workplace and CCCs. Improving breastfeeding outcomes for this population requires structural/policy changes that: 1) maximize opportunities for continued, direct breastfeeding and maternal/infant proximity and 2) enforce evidence-based CCC feeding protocols and standards and EC educator lactation training.

Keywords : breast feeding, lactation, child care, child day care centers, workplace, qualitative

INTRODUCTION

The importance of breastfeeding is well-established, with dose-dependent health implications for both lactating parents and their breastfed children[1]. There is additive benefit to breastfeeding among infants and children attending child care centers (CCC) (i.e., daycare); breastfeeding can prevent or reduce the severity of communicable diseases that are prevalent in CCCs[2-4], such as respiratory tract infections[5], gastrointestinal and diarrheal illness,[6] and otitis media[7]. Paradoxically, however, infants in CCCs are at elevated risk of breastfeeding discontinuation. A nationally representative cohort study with over 7,500 U.S. infants demonstrated that those enrolled in CCCs had 1.3 times the risk of discontinuing breastfeeding before six months compared to those in parental care[8].

Reduced breastfeeding among children attending CCCs is also problematic because of the potential number of families affected. In 2019, center-based child care was the most common non-relative child care arrangement for children prior to school entry in the U.S., with 32% of children under one year cared for in this setting[9]. Lack of access to paid parental leave in the U.S. requires many families to utilize non-family based child care arrangements upon return to work. The U.S. is the only industrialized nation without guaranteed paid parental or maternal leave policies[10], which compels many parents to return to work days or weeks following childbirth. Lactating parents who return to work shortly after birth can have difficulty maintaining milk supply and breastfeeding, compared to women who can maintain proximity to their infants and continue to breastfeed on demand. Researchers have found a strong positive association between paid maternity leave length and breastfeeding duration and exclusivity[11-13].

While the impact of paid leave and employer support on breastfeeding is well established[14, 15], less is known about the role of CCCs in breastfeeding maintenance. There are no legal standards in the U.S. for breastfeeding support and handling and provision of breast milk in CCCs, and substantial variation exists among state-based breastfeeding regulations[16]. Both the Surgeon General and the Centers for Disease Control and Prevention (CDC)[17,18] called on U.S. states and territories to implement breastfeeding support in CCCs and breastfeeding training for CCC providers based on the standards from the National Resource Center (NRC) for Health and Safety in Child Care and Early Education[19]. However, evidence of implementation, monitoring, and adherence to these breastfeeding support standards is scant. In a 2022 national analysis, only 15 states had developed a Breastfeeding Friendly Child Care designation program

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designed to recognize CCCs meeting some or all of NRC's guidelines, and these designations often relied solely on CCC self-assessment[20]. Our team's integrative review examining breastfeeding support and practices in CCCs describes absent or inconsistently followed breastfeeding policies[21]. The purpose of the current study was to explore the experience of breastfeeding/breast milk provision and breastfeeding support in U.S.-based CCCs from the perspective of mothers and early childhood (EC) educators.

METHODS

Recruitment, Sample, and Setting

From April to September 2018, we recruited and interviewed mothers of infants enrolled at CCCs and EC educators employed at CCCs within the U.S. Mothers and EC educators were recruited separately and their data were therefore not linked. Interviews addressed experiences with breastfeeding and provision of human milk in CCCs. Hereafter, unless otherwise specified and to adhere to the terminology used by participants, our use of the term "breastfeeding" refers to any method used to feed an infant their parent's own milk, including direct chest/breastfeeding and feeding expressed milk via a device like a bottle. We also use the term "mother" and "maternal" here, as our recruitment advertising, eligibility criteria, and other study materials used these terms. We acknowledge that not all breastfeeding/lactating parents identify as mothers. This study was approved by the University of Pittsburgh Human Research Protection Office.

Participants were recruited through a national social media advertising campaign through a research recruitment platform (Trialspark). Interviews were conducted after verbal informed consent was obtained. Mothers were eligible if the following criteria were met: 1) ≥18 years old, 2) working in a paid position ≥ 15 hours per week, 3) mother to an infant 12 months or younger enrolled in a CCC ≥ 15 hours per week, and 4) breastfed the index infant during the month prior to CCC enrollment. EC educators were eligible if they met the following criteria: 1) ≥18 years old, 2) employed full-time in a CCC (≥ 36 hours per week), and 3) currently providing care to infants 12 months and younger in the CCC ≥ 20 hours per week.

We planned to enroll a maximum of 50 mothers and 30 EC educators. We used maximum variation sampling to purposively recruit participants with variation in characteristics expected to impact experiences with breastfeeding in CCCs and most amenable to targeting

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through advertisements, including geographical areas and underrepresented groups in terms of race/ethnicity, prior/current breastfeeding, CCC type, and EC educator years of experience. These are factors associated with breastfeeding uptake, breastfeeding rates within CCCs (21), and/or understudied issues that we considered potentially influential in breastfeeding within the CCC environment. As the study progressed, we modified advertisements and participant selection to target those characteristics for which we did not have sufficient representation. Other characteristics known to impact breastfeeding practices, including income level for example, were not included in our selection frame because of potential participant sensitivity to these items, as well as cost limitations in multiple modifications of advertisements through our recruitment platform. Recruitment ceased when we noted significant redundancy in themes. With the rapid recruitment of mothers and wider variations in maternal (as compared to EC educator) experiences, we continued maternal enrollment for approximately 10 interviews beyond saturation.

Data Collection

Data collection occurred by phone. After consent was obtained, we administered a background survey assessing demographics and personal breastfeeding experience. For mothers, surveys also included questions on current employment (e.g., position, setting, hours), milk expression and infant feeding practices while working, CCC characteristics, any other child care arrangements for the index infant, and a six-item workplace lactation support scorecard modified for brevity and accessible language for the lay public[22] (α =.293;Table 1). We also administered a 14-item 5-point Likert scale questionnaire assessing agreement with existence and quality of lactation support at the infant's CCC (α=.79;Tables 1, 3). This questionnaire was adapted for parental relevancy from an 18-item dichotomous (yes/no) version of the survey[23].

Surveys for EC educators addressed past and current employment experience in child care, characteristics of participants' CCC (Table 2), and an 18-item Likert scale questionnaire assessing agreement with existence and quality of lactation support at participants' CCC (α: .619). Likert scale items were adapted from a dichotomous (yes/no) version of the questionnaire to capture nuance in implementation of lactation supports (Table 3)[23].

Following surveys, JRD or MG, both trained in qualitative interviewing, conducted audio-recorded interviews, which were professionally transcribed. Interviews followed a semi-

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structured interview guide, modified as the study progressed to establish convergence and divergence in themes. The maternal interview guide assessed experiences and decision-making around breastfeeding in the context of both employment and having an infant regularly attend a CCC. For EC educators, the interview guide assessed supports and barriers for breastfeeding families at the CCC, personal feelings on breastfeeding, center breastfeeding training, and the CCC's infant feeding regulations and processes. Both groups' interview guides included questions about desired improvements lactation support in CCCs and beyond. Participants were compensated $25.

Analysis

We used SPSS v. 28 to calculate summary statistics for survey data. RV and CH trained in qualitative analysis independently coded mother and EC educator interviews, respectively, following codebook development. The codebook was created through discussion and review of five maternal interviews with MG, JRD, and RV and later expanded and refined for EC educator transcripts with JRD and CH. Interviews were coded with conceptual labels using qualitative analysis techniques described by Corbin and Strauss[24] and ATLAS.ti software[25]. Codes were iteratively collapsed, expanded, defined, and refined by coders as analysis proceeded and developed into categories and interconnected themes. Approximately 25% of interviews (n=10 mother interviews, n=7 EC educator interviews) were double-coded by author MG to ensure consistent application of codes. All interviewers and analysts were white women of childbearing age—all but one without experience as a parent using a CCC. We used several techniques to aid analysis, including individual interview summaries, interview "titles" to capture the most salient categories/theme(s), and matrices to compare interviews on participant characteristics and major code categories/themes[26].

RESULTS

We interviewed 50 mothers and 22 EC educators. In both groups, participants were majority non-Hispanic white, married, and held a Bachelor's degree or higher (Tables 1, 2). Maternal participants were from 23 different states and concentrated in the northeast and Midwest (Fig.1). EC educators were from 12 different states and overrepresented in the northeast and upper Midwest (Fig.2).

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Most mothers worked in an office, worked ≥35 hours per week, expressed milk at work at least once or twice per day, and felt their workplace was "supportive" or "very supportive" of breastfeeding, though >60% (n=31) reported not having a paid maternity leave. Most mothers disagreed that there was a written policy on storage and handling of breast milk at their CCC, but agreed that their center upheld most other assessed breastfeeding support measures, including use of feeding plans and having EC staff who were well-trained to prepare and feed human milk (Table 3).

Most EC educators had ≥4 years experience in child care, had biological children, and combination-fed their children (formula and breastfeeding) as infants. Most also agreed or strongly agreed that their center upheld ten of the eighteen assessed breastfeeding support indicators (Table 3).

Qualitative Findings: Maternal Participants

Collectively, maternal participants expressed neutral feelings about their breastfeeding experiences in CCCs, though some voiced more positive or negative encounters. Workplace barriers to breastfeeding were more prominent than CCC barriers. Four themes summarized the breastfeeding experiences of mothers.

Worth the work

Participants were determined to breastfeed "no matter what," because they felt it was best, particularly because their infant attended a CCC. Perceived benefits and reasons for maintaining breastfeeding while back to work and using CCCs, despite its challenges, included child immunity and health benefits, bonding, and the economic burden of formula.

> *My baby is sick a lot because she's in daycare. And I get sick a lot because she's in daycare. And knowing that there are antibodies in the breastmilk that might help her when she's sick has also made me want to continue at least until she's a year old.*

Participants who introduced formula or weaned earlier than they intended often did so due to significant challenges with maintaining a sufficient milk supply. Formula use was perceived as matter of need and convenience.

They don't care what's in the bottles

Participants found that CCCs would support "whatever the parents want to do [with infant feeding]" within the confines of policy, though EC educators rarely went "above and beyond" to

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support breastfeeding dyads (with some exceptions). However, participants generally did not perceive this as problematic and had minimal expectations for breastfeeding support at CCCs.

> *They didn't have things for me to read or look at about breastfeeding. It was more, I knew beforehand that this was what I wanted to do, and essentially, as long as I followed their protocol, then it was fine.*

> *Basically, they [EC educators] have us make bottles. They don't care what's in the bottles. They're like, "make the bottles, put them in the fridge, we will feed them to your baby." ...the way they set it up it wouldn't matter if it's breast milk or formula. And they don't encourage me to come in [to breastfeed].*

Participants felt EC educators lacked knowledge about breast milk feeding, handling, and storage and described educating EC staff on these topics. In some cases, participants were the only families at their CCC providing breast milk, which was cited as a possible reason for low breastfeeding knowledge among EC educators. Several participants experienced anxiety in sending their child to a CCC whose providers had not cared for breastfed infants. In one instance, this led a participant to transition from breast milk to infant formula for CCC feedings.

A lot of pressure

Stress around infant feeding primarily existed at the intersection of work demands that made regular milk expression difficult (resulting in low milk volume) and CCC infant feeding practices that "wasted milk" or made it difficult to "keep up" adequate milk production. Tensions arose around human milk storage and disposal requirements at the CCC which necessitated the mother bringing in more milk than the infant consumed, as well as feeding methods that were perceived to lead to infant overconsumption. For example, mothers sometimes met resistance from CCCs when they requested cue-based/on-demand feedings or paced bottle-feeding—practices that required more EC educator time but were considered more responsive feeding methods that could conserve milk. Some participants perceived that EC staff were "happier" when infants were "overfed and sleepy."

> *When we have family watching him, we start the bottles a little bit smaller and then ask them to add milk as needed so we don't waste any. Where[as] at daycare, we have to*

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anticipate "this is the most he could possibly eat," and then some gets wasted. So that's a challenge at daycare.

I'd be like, "well, where is it [breast milk]? Can I have it? Can I take it home? Could you give it to him tomorrow?" And they [EC educators] would have dumped it out. And I know that there are states' handling guidelines and whatnot that they abide by. But…you put a lot of pressure – I'm not an overproducer by any stretch…so yeah, it does cause me anxiety when I hear they dump any out.

Participants experienced other sources of breastfeeding-related stress at CCCs. The labor involved in expressing milk, cleaning bottles and pump equipment, and preparing labeled bottles of expressed milk daily for EC staff was described as tedious, "like a second job," and "not sustainable." Some participants described CCCs without designated breastfeeding spaces and discouragement of unscheduled drop-ins for breastfeeding—"[EC educators] don't really want you to come...and then leave…because it gets the kids all flustered." Coming into CCCs to breastfeed during the workday was also difficult because of the time required to travel back and forth to work and that infants became distracted while nursing and "clingy" after breastfeeding when they needed to return to work.

Support is key

Participants described the importance that strong social support systems played in their ability and desire to maintain breastfeeding upon returning to the workplace. Partners provided substantial logistic, emotional, and moral support for participants, including assistance with household chores, preparing bottles with expressed milk for the EC staff, and encouragement to "keep going."

Economic privilege was critical in participants' capacity to continue to express milk and breastfeed. Those with financial means were able to purchase quality breast pumps and accessories, multiple pumps for different settings (e.g., home and work), and were often able to delay return to the workplace longer to establish a robust milk supply.

Workplace breastfeeding support, both in terms of policy and culture (e.g., "a pro breastfeeding climate"), was viewed as the most important factor determining participants' ability to maintain breastfeeding. Access to paid, extended leave was viewed as critical. Participants felt supported to breastfeed in the workplace when they had paid breaks for pumping

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and/or visits to the CCC to breastfeed, flexible work hours, health insurance benefits that provided quality electric breast pumps, and private lactation rooms at work that could accommodate more than one breastfeeding/pumping parent. Across employment settings, lack of accommodations (e.g., time, space) to express milk at work led to problems keeping up adequate milk supply. Several participants noted that onsite child care at work had the potential to solve most of their struggles with maintaining breastfeeding upon return to employment:

> *In a dream world, daycare would be right here at work, and I could just walk next door and feed him and come back. I think that would be so much easier.*

EC Educators

EC educators wanted to support breastfeeding parents and found ways to do so. However, they acknowledged conflict between parental feeding expectations, their own lack of breastfeeding knowledge and training, and seemingly arbitrary CCC regulations for breast milk handling. Two themes captured EC educators' experiences.

We get it

Collectively, participants described a supportive attitude toward breastfeeding at their CCC ("we will do whatever we can to help you") and noted health and bonding benefits of breastfeeding. However, they also stressed that they and their colleagues did not provide "judgement one way or another for breast milk or formula" and did not possess strong ideology around infant feeding. Some mentioned breast milk feeds were "easier" and less time consuming than formula feeds, because breast milk does "not clump up", does not need reconstituting, and is brought to the CCC in prepared bottles. Conversely, some participants noted formula preparation was easier, more readily available than breast milk, and kept infants satiated and content longer. Some disclosed discomfort in handling breast milk ("it's somebody else's bodily fluids…it takes a little bit getting used to getting the milk spit up all over you") or seeing parents breastfeed at the CCC. Participants who expressed discomfort included those who did not have children and those who had fed their children both infant formula and their own milk.

EC educators' personal breastfeeding experiences engendered a sense of solidarity with breastfeeding parents, such that they felt comfortable offering advice, support, and "going against a couple of the silly rules" regarding milk handling (e.g., not wearing gloves to warm milk, saving bottles of leftover breast milk in the refrigerator for the parent to take home). EC

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educators with personal breastfeeding experience also described educating other staff on breastfeeding.

> *I would say that the biggest determining factor [for how I support breastfeeding parents] was when I had my own son… because of some difficulties that we had…I really did like, a lot of research and was in a couple of support groups…I was able to bring that new information into our child care setting to the benefit, I really feel, of the parents… and also to be able to train staff… Several of [my EC educator colleagues] also breastfed their babies, so they understand, and went back to work, so they/we get it: the whole nursing mom, working thing.*

Regardless of personal breastfeeding experiences, participants understood the challenges and stress mothers experienced with milk expression in the workplace and the "pressure" to keep up their milk supply. They described multiple ways they attempted to ease this burden, including suggestions for parents to make smaller volume bottles to match infant intake, keeping parents updated on their infant's feeding patterns, and encouraging parents to come into the CCC to breastfeed. Some EC educators went further—referring parents to lactation experts, providing research articles on breastfeeding, and washing empty bottles. Participants also made special accommodations to try to ease the transition of a breastfed infant into the CCC, including feeding away from other children and distractions, wearing an article of clothing with the mother's scent, having the infant's "preferred" EC educator do feedings, and recommending different bottle nipple types to parents. These supportive practices did not differ meaningfully based on EC educator personal breastfeeding experiences.

We have to do what they [parents, CCC policymakers/regulators] want

Participants found themselves at the center of competing demands to support parents' breastfeeding goals while upholding state regulations and CCC policies for handling of breast milk. This tenuous position was further complicated by a consistent and recognized lack of breastfeeding training of EC educators by CCCs. Participants voiced a strong interest in obtaining more education and training about breast milk handling and feeding practices.

> *I think we can kind of be considered maybe not as knowledgeable or supportive [as we should be]… We try our best…it's not like a formal training like we should be doing.*

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State regulations and center policies for handling and storage of breast milk as reported by participants varied widely. Most participants noted regulations required them to discard breast milk or place it back in the child's cubby for the parent to dispose of after it had been unrefrigerated anywhere from 45 minutes to 2 hours. Some participants noted that their center allowed them to re-refrigerate leftover breast milk for the parent to decide what to do with it. One participant described a mother bringing in a bag of dry ice for her child's cubby, so unused milk could be saved and still in compliance with CCC policy not to re-refrigerate. Participants voiced a sense of moral failing, anger, frustration, and sadness about having to discard unused breast milk and wasting mothers' "hard work."

> *My one thing is I don't like dumping it [pumped breast milk] out because I struggled so much with [pumping myself]… And I think if I was home and it was my own milk, I'd stick it back in the fridge.*

Participants' frustration with CCC human milk storage and feeding policies was often matched by their frustration with breastfeeding parents' "unrealistic" expectations for specific feeding schedules or volumes. Providers discussed a tension between having "to do what [the parents] want" to conserve their available breast milk and avoid infant formula, while also attending to the baby's hunger cues. At times, providers deviated from parental-preferred feeding schedules in responding to infant hunger cues.

> *[The baby] starts looking hungry before the time comes that her mom wants us to feed her. I tend to, like, try and distract her for a little bit, but I can't bring myself to not feed a hungry baby. So we're supposed to be sticking to a schedule… I'm more concerned with feeding the baby than with making her mother happy about her schedule. So there's a little bit of tension there.*

> *My breastfed mommies can walk around at home and feed that baby whenever it cries for a couple of minutes, just a couple sips. We can't do that [because of caring for other infants and policies for milk disposal]. I need the baby to eat at least a bottle to be happy, versus I can't feed a baby every half hour.*

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DISCUSSION

Bidirectional tension existed between mothers and EC educators in relation to breastfeeding support in CCCs. While the most immediate perceived threat to mothers' breastfeeding aspirations was insufficient milk supply stemming from lack of workplace lactation accommodations, mothers attempted to manage this issue by asking CCCs to conserve expressed milk through measures like adapting their milk storage practices. Mothers expressed frustration when they met resistance on feeding accommodations from CCCs and staff. Equally, EC educators felt unable to support breastfeeding mothers and their infants in the ways they wanted, due to restrictive infant feeding regulations, insufficient breastfeeding knowledge and training, and difficulties inherent in matching a parent's feeding style while simultaneously maintaining a high level of care for other infants in their charge.

The Social Ecological Model, which conceptualizes health and health behaviors as influenced by embedded layers of individual, interpersonal, organizational, community, and public policy factors, provides a useful framework to contextualize these findings (Fig.3)[27]. Mothers and EC educators were most attuned to individual and interpersonal (and sometimes organizational) level interactions and actions that impacted their breastfeeding experiences in CCCs. Maternal and EC educator participants who had more positive breastfeeding experiences were those who maintained good bidirectional communication about the infant's feeding at the CCC. Mothers experienced less pressure when their workplace was able to accommodate their pumping needs and schedule. Mothers who are returning to work and planning to use CCCs might therefore be counseled, even during pregnancy or early postpartum, to begin conversations with their workplaces and potential CCCs about breastfeeding accommodations. Parents may also choose to explore newer technologies, like wearable pumps, that allow pumping to occur discreetly whilst continuing to work and have face-to-face workplace interactions. Likewise, CCCs can consider implementing communication systems with parents that prioritize frequent updates or dialogue about evolving infant feeding patterns.

Societal and public policy factors that came to bear on participants' individual experiences were more rarely discussed (e.g., expansion of CCC workforce, center quality) — perhaps because their ripple effects are difficult to observe directly or because they are considered immutable. One issue that surfaced in maternal and EC educator interviews spanning the community, organizational, and public policy levels of influence was the wide variation in

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CCC infant feeding procedures, which included human milk storage and preparation. Achieving consensus on breastfeeding guidelines for CCCs may initially be most feasible at community and organizational levels, where advocates can work through local health departments, child care resource and referral agencies, and national child care corporations. Consensus guidelines can be modeled from principles of Breastfeeding Friendly Child Care Centers, include having a written breastfeeding policy and training all child care staff on the policy and in the protection, promotion, and support of breastfeeding[28]. Currently, these elements are consistently absent in U.S.-based CCCs[20, 29].

At the macro policy level, studies have found substantial state-based variation in breastfeeding and infant feeding related laws and regulations[16, 30]. While CCCs are required to follow state and federal regulations, infant feeding policy change at these levels is complicated by bureaucracy. Absent state and federal policy, however, CCCs typically adopt childcare recommendations from national organizations. Therefore, focusing efforts on ensuring consistency, clarity, and regular evidence-based updates to policy and position statements from such organizations, like the Centers for Disease Control and Prevention (CDC), Head Start, and the American Academy of Pediatrics/Caring for our Children, is a worthwhile endeavor. For milk storage and preparation, for example, CDC guidelines recommend that breast milk leftover from a previous feeding must be used or discarded within 2 hours[31], but further details that encompass the range of refeeding scenarios that might occur in a CCC are not elucidated (e.g., initial milk storage conditions). This lack of guidance reflects the absence of rigorous research on the safety and quality of human milk under various storage conditions.

Similar to our findings, other researchers have found limited breastfeeding training and knowledge among child care staff in the U.S.[32]. Although we found few instances of negative attitudes toward breastfeeding or handling/preparation of human milk among EC educators (in contrast to findings of at least one study[33]), ambivalent attitudes toward breastfeeding were common. However, EC educators with first-hand positive breastfeeding experience was a pivotal factor in EC educators becoming breastfeeding advocates for parents. The importance of EC educator personal breastfeeding experience is corroborated by a qualitative study of 46 CCCs in Washington State[40]. Personal breastfeeding experience of EC educators notwithstanding, national and state-level adoption of Breastfeeding Friendly Childcare policies have the potential

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to counteract breastfeeding ambivalence and infant formula feeding norms present in many U.S. CCCs[34].

While 82% of maternal participants indicated that their workplace was "supportive" or "very supportive" of breastfeeding, our qualitative findings highlight the difficulties mothers still experienced combining breastfeeding with return to work, particularly with regard to the pressure to pump large volumes of milk while separated from one's infant. This underscores the importance of continued attention to accommodations for parents within the labor force, including universal access to extended, paid parental leave, flexible work models, adequate time and space for milk expression or direct breastfeeding, and support for breastfeeding/milk expression from colleagues and supervisors[14, 35-37]. Our findings also indicate enthusiasm for creative arrangements that would enable parents to more fluidly combine breastfeeding and work, such as onsite workplace child care.

Likewise, there is an urgent need to address inadequate child care availability and quality in the U.S., which was exacerbated by the COVID-19 pandemic. While number of CCCs and child care employment has returned to pre-pandemic levels, child care workers remain among the lowest paid professionals in the U.S., with wages 60% below the national average in 2023[38, 39]. In July 2023, the Biden administration took steps to cap out-of-pocket expenses for families using child care and to increase the reliability of payments to child care providers through the Child Care & Development Block Grant (CCDBG) as part of the American Rescue Program[40]. Policies like these have potential to strengthen the child care workforce, thereby increasing CCCs' capacity to provide lactation training and lactation support for families.

Our findings have potential implications beyond the U.S. While high-income countries that provide paid parental leave frequently also provide high-quality, subsidized childcare[41], breastfeeding support may still be lacking. For example, limited breastfeeding training and knowledge among CCC staff was also an identified barrier for breastfeeding support among 62 CCCs in Adelaide Australia (where childcare is subsidized[42]) in 2013[43]; survey responses indicated that over 60% centers had no formal or informal breastfeeding training for staff. More recent research on breastfeeding support in childcare settings outside the U.S., and particularly in low- and middle- income countries, is lacking.

The primary limitation of this study was selection bias, attributable in part to our eligibility criteria and online recruitment strategy, which may have been less likely to reach

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underserved populations. For example, we did not include non-English speakers, and the high maternal education level indicates probable low representation of low-income mothers. In addition, almost all EC educators were white, whereas nationally, the early childhood education (ECE) workforce is 63% white and 17% non-Hispanic Black[44]. More than 40% of maternal and EC educators affirmed that their center was accredited by the National Association for the Education of Young Children (NAEYC; a marker of high-quality early childhood education), compared to the national NAEYC accreditation rate of < 12%[45]. Poor representation from racial/ethnic minorities, socioeconomically vulnerable groups, and under-resourced areas limit generalizability of our findings to families and CCC programs with lower rates of breastfeeding. EC educator experiences, attitudes, and support for breastfeeding and CCC breastfeeding resources, policies, and practices may be quite different in these populations. In addition, our eligibility criteria specified that maternal participants must have been employed and provided breast milk in the month prior to CCC enrollment. Thus, we did reach those who stopped breastfeeding or working because of the combined challenge of these activities.

Another limitation was the timing of data collection, which occurred prior to the COVID-19 pandemic. Therefore, we did not capture the seismic shifts that occurred in child care settings during the pandemic, including closures, short-staffing, and shifting work environments for many working parents (there were less notable impacts on overall breastfeeding rates as a result of the pandemic[46-48]). Some pandemic-related changes have lingered or even been exacerbated after the U.S. Department of Health and Human Services lifted the federal Public Health Emergency in May 2023. A February 2024 report by NAEYC which surveyed over 10,000 EC educators across the U.S. found that many ECE programs are facing rising operating costs, recurrent staff shortages, and threatened closure after the American Rescue Program child care funding expired in September 2023 and as some parents have shifted to less consistent use of CCCs[49, 50]. With these compounding challenges, it is plausible that breastfeeding support in CCCs has been deprioritized and worsened since our data were collected.

CONCLUSION

Both mothers and EC educators recognized shortcomings in breastfeeding support at CCCs, including in policies for milk storage and feeding and inadequate breastfeeding training of EC educators. These issues, along with maternal workplace factors and the mother's support

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system, impacted the duration and quality of mothers' breastfeeding experiences. Our findings support the need for further research and more detailed guidelines on the safety and nutritional quality of raw human milk under various conditions of storage and feeding/refeeding. In addition, as the U.S. works to expand and increase the quality of the child care workforce, it will be important to prioritize breastfeeding education for EC educators and include breastfeeding rates in CCCs as a key marker of quality. Repeating this study with federally-funded CCC programs would provide a sample more reflective of the demographic-heterogeneity within the U.S.

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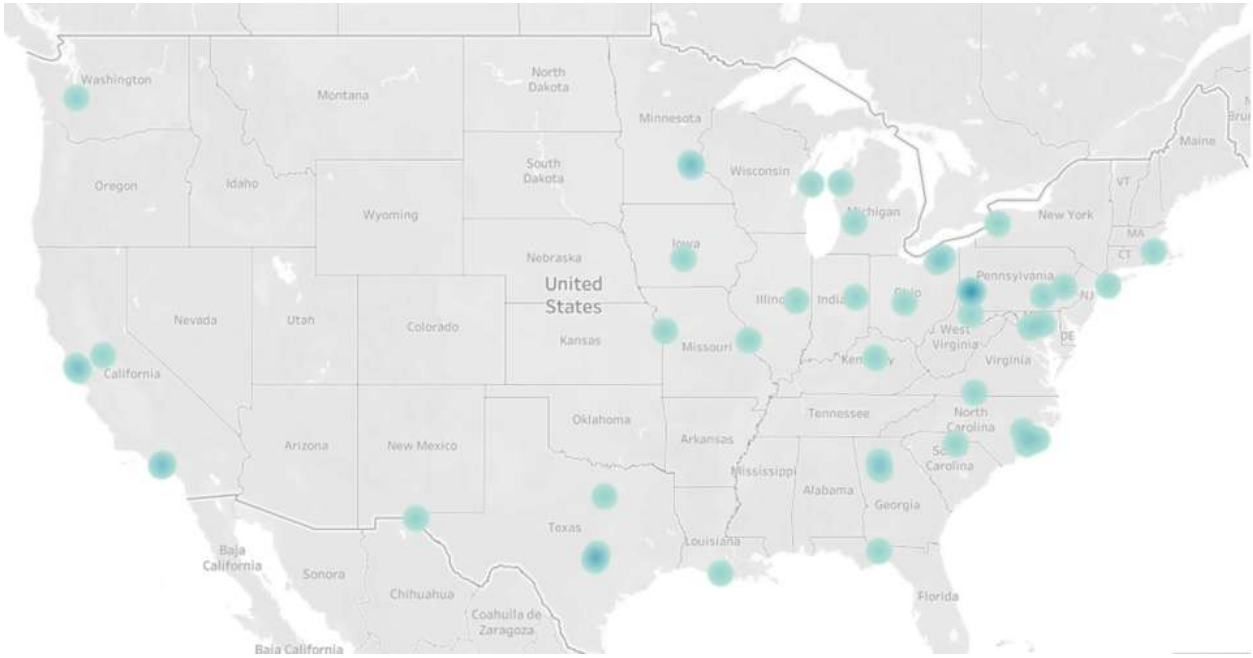

Figure 1. Geographical representation of maternal participants (n=50; blue dots), with darker coloring representing zip codes with higher concentration of participants.

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Figure 2. Geographical representation of EC educator participants (n=22; red dots)

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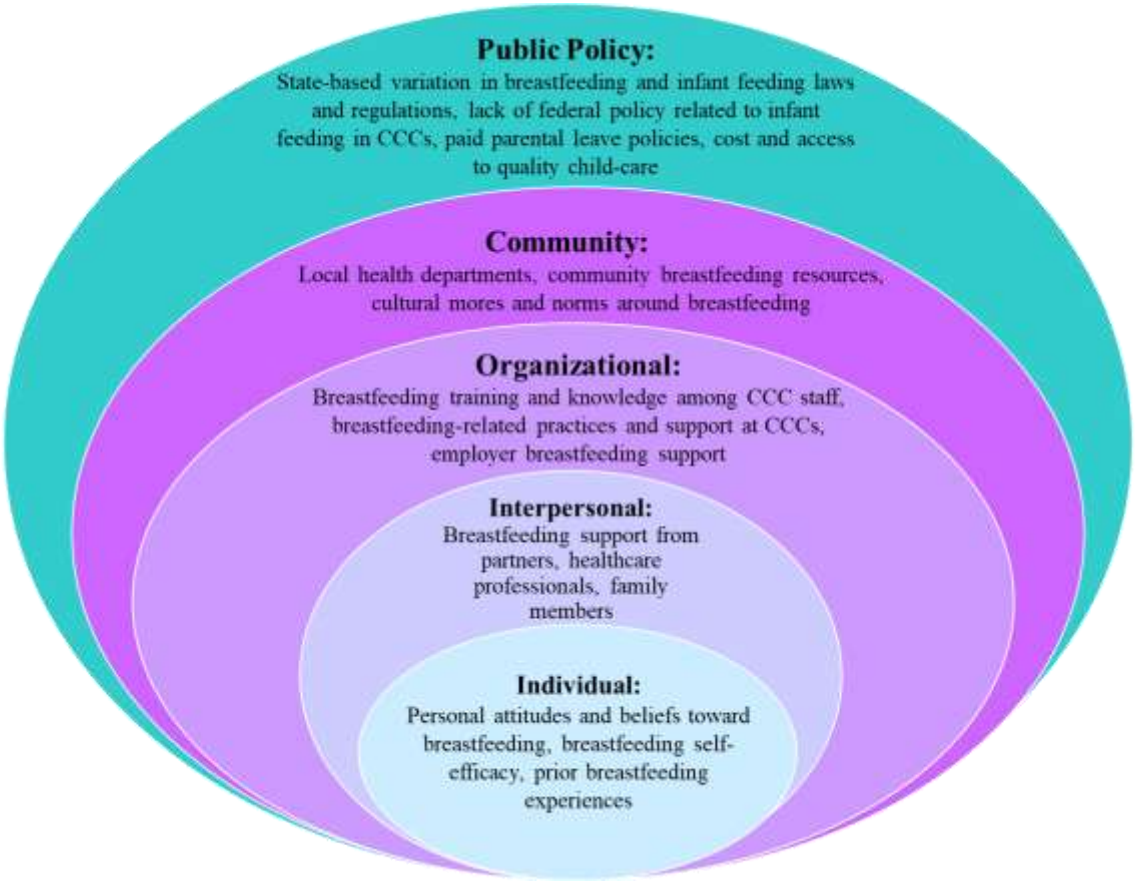

Figure 3. Social Ecological Model conceptualization of levels of influence on breastfeeding in child care centers, as identified by participants and documented in the literature.

CCCs=child care centers

Note: Author-created rendering/conceptualization of influences on breastfeeding in CCCs based on the Social Ecological Model

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