Food Industry Centre Cardiff Metropolitan University



# Introduction

The benefits of breastfeeding are widely documented. To achieve optimal development and health, it is recommended that infants should be exclusively breastfed for the first six-months [1]. Breastmilk continues to provide up to half of an infant's nutritional needs during the second year of life [1].

Many women choose to express breastmilk for multiple reasons to enable infants to receiving breastmilk when feeding at the breast directly may not be an option. However, when providing an infant with expressed breastmilk, parents have additional hygienic responsibility for the pump and feeding vessels, as well as ensuring safe storage of the breastmilk [2].

Although research has been undertaken regarding the hygiene methods of preparing powdered infant formula [3, 4] and contamination of infant feeding bottles in developing countries [5, 6], currently, a significant lack a data exists regarding the hygiene perceptions and practices of parents specifically when expressing and storing breastmilk

#### Purpose

The specific objectives for this part of "Project Expressing" were to explore mothers' hygiene perceptions when expressing, storing and providing breastmilk for infants and to establish trusted sources of information.



"Project Expressing" is a large, multi-phased research collaboration between Cardiff Metropolitan University and Swansea University exploring the hygiene perceptions and practices of parents providing expressed breastmilk for infants.

# Method

Data collection tools: An interview schedule was developed to explore hygiene perceptions when expressing, storing, and providing breastmilk for infants and to establish trusted sources of information. A pre-participation questionnaire was created to capture basic demographic characteristics, establish eligibility to participate, and to help guide interview discussion.

nt: Adverts detailing the study were posted on UK-based parental social media groups. Monetary incentives (£20 e-voucher/charity donation of choice) were given to those that participated.

: In-depth interviews were undertaken via telephone or video call with Data collect mothers who expressed breastmilk (n=40). Audio/video recordings were utilised to create a transcript of the interviews. Content analysis of transcripts was undertaken.

Ethical Approval: Ethical approval to undertake the research was obtained from the Healthcare and Food Ethics Committee at Cardiff Metropolitan University 'Project Expressing: Interviews': Sta-5678.

As part of "Project Expressing", 40 interviews were undertaken with mothers, this included birth mothers (n=39), and an adoptive mother (n=1) who had expressed breastmilk for their child.

As indicated in Table 1, the majority (60%) were aged 25—34 years, and were living in England (85%). It was reported that 45% were on maternity or adoption leave, and 35% were working.

Six of the forty mothers had given birth to preterm babies (born between 26 and 34 weeks gestation), and eight reported having expressing breastmilk for their infant at neonatal intensive care (NICU), high dependency (HDU) or special care (SCBU) units. During interview, three of the mothers described experiencing a stillbirth or neonatal death.

#### Table 1. Demographic characteristics of participants (*n*=40)

Factor	Description	n	%
Age	18-24 years old	2	5
	25-34 years old	24	60
	35-44 years old	12	30
	45-54 years old	2	5
Location	England	34	85
	Scotland	1	3
	Wales	5	13
Ethnicity	White - Welsh/English/Scottish/ Northern Irish/British	34	85
	White - Irish	1	3
	White - Other	3	8
	Multiple ethnic group - White/Asian	1	3
	Black/Black British - African	1	3
Gestation of child at birth	Extreme preterm: <28 w 0d	2	5
	Very preterm: 28w 0d — 31w 6d	1	3
	Moderate preterm: 32w 0d — 33w 6d	1	3
	Late preterm: 34w 0d — 36w 6d	2	5
	Early term: 37w 0d — 38w 6d	11	28
	Full term: 39w 0d — 40w 6d	19	48
	Late term: 41w 0d — 41w 6d	4	10
Employment status	Working full-time	8	20
	Working part-time	6	15
	A homemaker or stay-at-home parent	4	10
	On maternity or adoption leave	18	45
	Student	4	10
Expressing locations	Neonatal intensive care, high depend- ency, or special care baby units	8	20
	Labour ward or postnatal ward	15	38
	At home	39	98
	At workplace	8	20
	Place of study	1	3
	In car	8	20
Expressing method	By hand (without pump)	22	55
	A manual hand-operated pump	16	40
	A battery powered pump	10	25
	An electric pump	31	78

As indicated in Table 1, the pre-interview survey established that all participants reported having used one or more type of breast pump, including, electric, battery powered, or manual hand-operated pumps. Such breast pumps work by creating a seal around the nipple, applying and releasing suction to mimic the sucking action of an infant to extract milk from the breast.

During the interviews, many mothers described also using low suction silicone milk collectors that are placed within a bra to collect leaking breastmilk (referred to as 'let down') that would otherwise be absorbed by a nursing breast pads.

# "I Express Breastmilk. What's Your Superpower?": Hygiene Perceptions and Practices of UK Mothers Expressing Breastmilk for Infants Ellen W. Evans<sup>1</sup>\* & Sophia Komninou<sup>2</sup>

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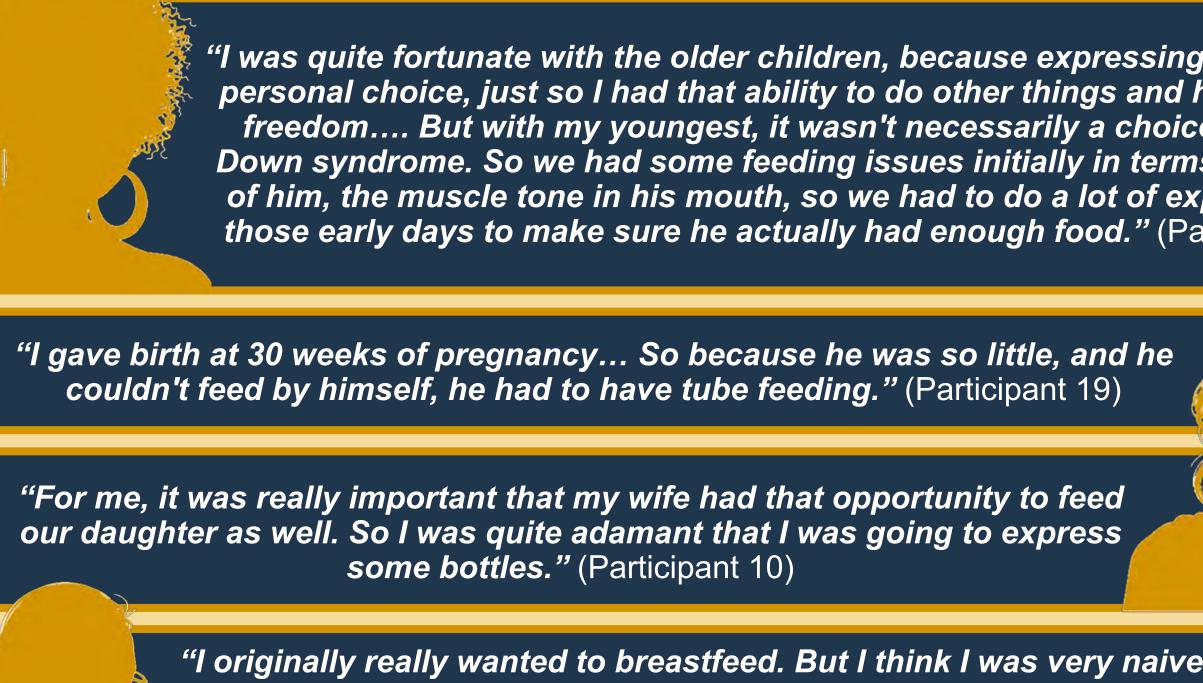
# Results

#### **Demographic characteristics**

#### Reasons for expressing breastmilk

Many referred to expressing as "the next best thing" to breastfeeding, particularly when personal circumstances such as premature-birth and hospitalisation, or physical issues such as poor latch and tongue-tie, prevented direct breastfeeding.

Whereas others described choosing to express to increase milk supply, enable others to feed, to give them time away from the baby, or to return to work. Being able to donate to a milk bank was another motivator to express breastmilk.



"I originally really wanted to breastfeed. But I think I was very naive as to how difficult it would be... So for me, it was a really, really painful latch. No matter what I tried... And it got to the point where I just thought 'I can't recover from a C section, and breastfeed'. So the next thought was, 'Okay, well, let's see if I can express?'." (Participant 18)

#### Hygiene perceptions and practices

Concern existed regarding appropriate storage durations for breastmilk. Some were aware of National Health Service (NHS) guidance (8d at <4°C, or 3d at >4° C), but believed the 8d duration to be "too long", or were unsure of appropriate duration due to not having a thermometer. Many referred to a "six, six, six, rule", (6h ambient, 6d refrigerated, or 6m frozen), likewise, some believed the ambient and refrigerated duration to be "too long", therefore, reported shorter durations.

Hygiene practices were of greater concern when infants were preterm or very young; whereas when weaning, hygiene concerns of mothers reduced.

"I looked on the NHS website. And it's like, 'if your fridge is at this temperature, you can keep your breastmilk for this long' when we don't have a thermometer, and I don't know the exact temperature of the fridge." (Participant 05)

"I think someone told me there's a 666 rule: six hours out of the fridge, six days in the fridge, then six months in the freezer. That did seem like too long for me - six hours out. So I do actually put it in the fridge as soon as it's expressed, to be honest, and then I use it in four days, if I haven't used that milk in four days, I'll put it in the freezer and just mark on the freezer bag 'milk bath only'." (Participant 10)

"I mean, it's common sense that you don't leave milk on the side for too long, because it's going to go off. And so it was kind of just keep it cool, make sure the place you do in it is clean, make sure your hands are clean, you know, that kind of stuff." (Participant 09)

"When my son was over seven months, eating normal food, you know, crawling around eating things off the floor, I wasn't so paranoid about hygiene... but, when my son was younger, I was more cautious about hygiene" (Participant 26)

"I think I would have been more laid back if he was full term. Maybe I would've been more relaxed with hygiene. But because he was early, I was in my head like, 🚽 'okay, he's more vulnerable, we need to be careful'." (Participant 06)

"I was quite fortunate with the older children, because expressing really was a personal choice, just so I had that ability to do other things and have a bit of freedom.... But with my youngest, it wasn't necessarily a choice, he's got Down syndrome. So we had some feeding issues initially in terms of the size of him, the muscle tone in his mouth, so we had to do a lot of expressing in those early days to make sure he actually had enough food." (Participant 07)

#### Hygiene and storage related challenges

A number of challenges relating were discussed during the interviews. Many mothers described being unaware of the importance of correct flange sizes.

Challenging situations relating to hygiene when expressing at work or university were discussed in detail, which included fears regarding temperature of workplace refrigerators and access to appropriate facilities to safely and comfortably sterilise, express, and store breastmilk whilst at work.

> "...the pumping just became like torture to me when you hear the wiring of the machine. And I found out, my nipples aren't inverted, but the flange was too big. So that was another issue with the pumping which hadn't been discussed or anything in the hospital. (Participant 19)

'There's the thing of storing it in the fridge (at work) and thinking what would I put 🥖 it in to make sure that nobody touches it, and that nobody is grossed out by it, because people are idiots about breastmilk. And transporting it, the journey home from work, the logistics about keeping it at the right temperature on the way home. So there was all that to think about." (Participant 027)

> "Expressing in uni was challenging. Although I had approached them beforehand to make sure a room was available. I did find myself on the first few days having to express in the car, because they didn't have a room ready. I was having to put my coat up on the windows so that people couldn't see me... When they allocated me a room, it was in a different building, it wasn't a locked room, which was not ideal. It wasn't a feeding room, it was just a spare room with just a chair that I could use." (Participant 20)

*"I didn't have the facilities to sterilise my equipment, I found that I was* wasting a lot of milk, because I would express a second time in the day purely to keep my supplies up, but because the equipment wasn't clean, I wasn't keeping that milk." (Participant 020)

### Source of hygiene and storage information

In addition to NHS website, many reported obtaining storage advice from peers on social media platforms, many indicated it to be a preferred and trusted source as those that contributed were relatable; particularly as healthcare professions were not readily accessible, and questions would be answered immediately. Information needed to be easily available.

*"I would say Instagram is where I've managed to find most information, there was* one or two mums that I'd managed to find on Instagram that we're exclusively expressing... So I essentially just followed what she did. No idea of whether it was right or wrong. But it was the only person I found that had some kind of logical pathway to follow." (Participant 33)

If I needed to ring the health visitor, I could do, and then she potentially would ring you back or not, depending on whether she was at work. So kind of most of what I found out would be Google searches in the middle of the night." (Participant 09)

*"I am in a group on Facebook. If anything's came up, I've asked a couple of* questions to try and get a bit of help. I find that other people are like going through the same thing, and they can give advice and things back and help like whatever time of day." (Participant 05)

> "So, that first three, four months, Facebook was my main comfort group. I mean, I tried to speak with the health visitor. So, I was taking some comfort from Facebook, as I could relate with other women there and felt like I wasn't alone on that journey. But, I always double checking everything. Taking another person's experiences, but then seeking out to have evidence-based information too" (Participant 19)

"So you can ask questions, whatever the time of the day it doesn't matter." So I asked a few questions and I posted some pictures, so I got immediate replies and answers through that Facebook group." (Participant 04)



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# Significance of the study







- Breastmilk expression was important for mothers in this study to ensure infant wellbeing, particularly when feeding directly at the breast was not possible.
- Despite research focusing on hygienic practices when preparing powdered infant formula, "Project Expressing" is the first to explore the hygiene perceptions and practices related to expressed breastmilk with UK-based mothers.
- Given the concern, confusion, and discrepancies in hygienic practices that were discussed, there is a need to undertake further research to explore the hygiene knowledge, self-reported hygienic practices, and the perceived risk of illness in relation to expressing and storing breastmilk.
- Workplace support should enable women to transition back into the workplace after maternity leave and express breastmilk in a suitable and hygienic environment to ensure the safety of expressed breastmilk for their infants.
- As a result of social media being an important, trusted, and easily accessible resource to obtain hygiene and storage information, there is a need to undertake netnographic research to explore the nature and accuracy of the information shared in such domains.

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