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*MacVicar, Humphrey & Forbes-McKay (2018)*  
*Breastfeeding and the substance exposed mother and baby*

*'Breastfeeding and the substance exposed mother and baby'*

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**Abstract**

**Background:** Breastfeeding rates are typically low for women with a substance use disorder. This is despite the specific benefit of breastfeeding to alleviate the severity of neonatal abstinence syndrome and the well-documented generic advantages. This study explored the feasibility of in-hospital, tailored breastfeeding support for the substance exposed mother and baby.

**Methods:** this was a mixed methods feasibility study, in Scotland from April 2014 to May 2015. Women with a substance use disorder received either standard Baby Friendly Initiative care only or were given additional support which included a dedicated breastfeeding support worker; personalised capacity building approach and a low stimuli environment for 5 days. Feasibility outcome measures were maternal recruitment, satisfaction and acceptability of support; breastfeeding on 5th postnatal day and severity of neonatal abstinence syndrome.

**Results:** 14 mother/infant dyads participated. Intervention participants demonstrated higher rates of continued breastfeeding and reported a greater degree of satisfaction with support and confidence in their breastfeeding ability. Maternal experience of health care practices, attitudes and postnatal environment influenced their perceptions of breastfeeding support. Breastfed infants were less likely to require pharmacotherapy for neonatal withdrawal and had a shorter hospital stay.

**Conclusions:** the findings highlight the feasibility of tailored breastfeeding support for the substance exposed mother and baby and endorse the promotion and support of breastfeeding for this group. Future research of a statistically powered randomized controlled trial to evaluate clinical efficacy is recommended.

**Keywords:** breastfeeding, neonatal abstinence syndrome, non-pharmacological care, substance use disorder.

## **Introduction**

The use and misuse of addictive substances is an ongoing global health and social problem and substance dependence in pregnancy is particularly concerning as this affects maternal, fetal and neonatal well-being (1). The recommended management of substance use in pregnancy is a harm reduction programme inclusive of opioid substitution medication. However, while this strategy stabilises pregnancy viability it places the newborn at risk of neonatal abstinence syndrome (2). Infants affected by abstinence syndrome may experience symptoms such as adverse neuro-behaviour, feeding difficulties, respiratory distress and seizures. Due to the illicit nature of substance use and differing diagnostic practices there is significant variability in the recorded prevalence of abstinence syndrome but accumulated data suggests this condition is a significant public health challenge globally (2–6/1000 live births) (3). This highlights the potential health, social, economic and human costs of the current situation and the imperative need for effective management (4, 5).

Current guidelines recommend the use of supportive care to alleviate the severity of neonatal withdrawal. Supportive care includes consolation measures of swaddling, non-nutritive sucking and environmental modifications to minimise external stimuli (6). Breastfeeding, when not medically contraindicated, should be promoted as the transfer of substitution medication in the breast milk and the physical act of breastfeeding are thought to provide comfort for the infant (7). If supportive care is insufficient to ease withdrawal symptoms secondary management of pharmacotherapy is indicated (8, 9). However, pharmacotherapy prolongs the length of hospital stay for the infant. This increases health care costs and has the

potential to interfere with mother/infant bonding due to separation (6). There is also ongoing debate regarding the long-term impact of opiate and barbiturate therapy on the developing neonatal brain (8, 9).

Given the disadvantages of pharmacotherapy, supporting breastfeeding in the initial postnatal period may optimise the effectiveness of non-pharmacological care.

Previous research has demonstrated an association between breastfeeding and improved outcomes for infants at risk of abstinence syndrome (10). These include a reduced need for pharmacotherapy, lower abstinence scores and a shorter duration of hospitalization for breastfed infants or those given breast milk containing opiates compared to formula feeding (11,12). Many women who are substance dependent during pregnancy feel guilt and responsibility for the baby's condition and breastfeeding, as an act only the mother can perform, enables them to positively impact the baby's health (13). This may contribute to mother/infant attachment, which has been noted as problematic in this group (6). Allied to these specific advantages exclusive to substance dependence, breastfeeding also conveys generic health, psychological and economic benefits for the mother and child (14).

Significant challenges exist to achieving improved breastfeeding outcomes for substance dependent women, with the reasons for this thought to be multifactorial. Current initiation rates are well below national averages and high attrition levels are common in the first postnatal week when opioid withdrawal symptoms peak (15). Substance dependence is associated with socio-economic deprivation where the established norm of formula feeding has led to low maternal self-confidence in breastfeeding ability and an expectation of failure (16). This influences initiation rates and maternal perseverance when breastfeeding difficulties arise. Additionally, the

adverse impact of withdrawal symptoms on the infant's physical feeding ability, such as an uncoordinated sucking pattern and agitation, presents a further challenge (17).

The safety of breastfeeding in conjunction with substance use continues to be questioned in the health care literature despite substantial evidence of the low bioavailability of opioids in breastmilk (10, 18). Furthermore, a lack of practitioner knowledge, competence or confidence is thought to contribute to both poor promotion of breastfeeding in the antenatal period and discouraging and restrictive institutional practices postnatally (19, 20).

Given the advantages and the noted barriers, there is a need to actively promote and enable breastfeeding for substance dependent mothers. Yet there is limited research on ways in which practitioners can facilitate women to sustain breastfeeding. This paper explores the feasibility of in-hospital, tailored breastfeeding support for the substance exposed mother and baby.

## **Methods**

The research design was a mixed method pilot study, including a randomized controlled trial and maternal questionnaire. The primary objective was to evaluate the feasibility of the intervention, and to assess whether a future adequately powered randomized controlled trial was warranted (21). The research was conducted in a tertiary maternity hospital and participant recruitment was undertaken between April 2014 and May 2015. The study was approved by the North of Scotland Research Ethics Committees and National Health Service Grampian Research and Development. Maternal written consent was obtained prior to study randomization and verbal consent re-assessed daily from intervention participants.

## **Intervention**

The intervention group received integrated support based on practical breastfeeding advice, promotion of maternal self-efficacy through encouragement and persuasion, and provision of neonatal self-consolation techniques within a low stimuli environment. This included a 1-hour daily scheduled session with a dedicated support worker. The support workers were Baby Friendly Initiative trained with additional instruction in facilitating breastfeeding in the context of neonatal withdrawal. During the daily sessions the support worker collaborated with the mother to identify breastfeeding barriers, problem solve and set individualised, family-centred goals. Environmental modifications to minimise external stimuli included a designated area with regulated noise levels, temperature control and reduced activity. The infant was nursed in a shielded cot and canopy to limit exposure to light and the mother was provided with, and instructed on the use of, consolation techniques such as non-nutritive sucking and loose swaddling to assist neonatal self-soothing. This was delivered in addition to the breastfeeding support available to all postnatal women and was made available from birth up to, and including, the 5th postnatal day. This duration was chosen to coincide with the period of neonatal withdrawal expected of in-utero opiate exposure (2).

The control group received standard postnatal care of the neonate at risk of abstinence syndrome. This included first line management of supportive care although the mother and baby could be allocated to a multi-occupancy room (not a low-stimuli environment). Feeding advice was provided by ward staff and underpinned by the UNICEF ten steps to successful breastfeeding (14). Severity of neonatal withdrawal was assessed every 4-6 hours using the Finnegan Neonatal Scoring System and 3 consecutive scores of 8, or three scores equal to, or greater



than, 24 was indicative of severe withdrawal requiring admission to the neonatal unit for pharmacotherapy (22).

### Participants and setting

Participants were recruited from a combined specialist obstetric/substance use clinic. Inclusion criteria included opioid substitution medication therapy during pregnancy, intention to breastfeed, greater than 36-week gestation and over 16 years of age. Exclusion criteria included HIV positive, ongoing illicit psychoactive drug or alcohol use and a child removal order in force. Contact was made through the clinic team, who acted as gatekeepers and forwarded details to the researcher of eligible women expressing an interest in study participation (23). Women were recruited in the antenatal period and visited post birth to assess their continued eligibility and reconfirm their wish to participate in the study. Written consent was then obtained. Participants were randomly allocated to the intervention or control group using a computer-generated randomization process. Allocation to group was not concealed following the randomization process as intervention participants were located in a specifically designated area. As is standard for a feasibility study, recruitment was not bound by a predetermined sample size but by the study duration (21).

### Data collection and analysis

The study outcome explored intervention feasibility defined as maternal participation with, and acceptability of, the study and whether it warranted further research by demonstrating a trend towards breastfeeding on the 5th postnatal day and impact on withdrawal severity. Breastfeeding was defined as feeding at breast; ongoing attempts to latch onto breast and expressed breastmilk given for greater than 50% of oral intake. This liberal evaluation of breastfeeding was made to allow for the

potential of medical recommendation to maintain neonatal nutrition during this critical period but there was ongoing maternal commitment to establish breastfeeding (2). Neonatal abstinence severity was evaluated by the need for pharmacotherapy to alleviate withdrawal symptoms and length of hospital stay.

Data collection included recruitment, randomization and retention rates, maternal and neonatal demographics and infant feeding on 5<sup>th</sup> postnatal day, neonatal pharmacotherapy and length of hospital stay. Demographic characteristics, numbers and responses were entered into Statistical Package for the Social Sciences software. A summary of the data as descriptive statistics, percentages, epidemiological range, means and standard deviation were obtained. Maternal perspective of breastfeeding support was solicited in a questionnaire with five Likert scale questions and free text comments. Maternal comments were analysed using thematic analysis conducted by two researchers (24). Thematic Analysis uses a process of coding to identifying patterns and themes to examine the meaning of the data and thus provide a description of the social reality of the phenomenon.

## **Results**

### Participants

The intervention and control groups had similar maternal and neonatal baseline characteristics. All of the participants were white British with the majority prescribed methadone as substitution medication. The intervention group contained more multiparous women with greater parity than the control group. Due to the larger percentage of previous children there were also more intervention group women with

prior breastfeeding experience, 4 participants having breastfed before compared to only 1 in the control group. (Table 1)

From the annual clinic case load of 53 women the clinic team referred 19 women who met the eligibility criteria in the antenatal period and consented for their details to be passed to the research team. Of this number, 1 woman declined participation and 4 others became ineligible prior to postnatal randomization. Ineligibility occurred due to premature birth, pre-birth child protection order, admission to neonatal intensive care unit due to respiratory distress at birth and failure of the referral process leading to one woman being missed from study enrolment. There were 14 mother and infant dyads randomly assigned (74% of those referred). At study completion 3 women did not return the maternal questionnaire resulting in a completion of 11/14 (78%) (Figure 1).

#### Breastfeeding rates and measures of neonatal withdrawal severity

On the 5<sup>th</sup> postnatal day 100% (7/7) of the intervention group were still breastfeeding compared to 57% (4/7) of control participants (Table 1). Of the intervention group 28% (2/7) required pharmacotherapy for severe withdrawal compared to 57% (4/7) in the control group. The intervention group also had a shorter duration of hospitalization (Mean 10.5 days) than the control group (Mean 19.4 days).

Collectively breastfed infants were less likely to require pharmacotherapy (3/11 breastfeeding vs 3/3 formula feeding). Breastfeeding infants were discharged from the hospital sooner than formula fed infants (10.8 days and 30.0 days, respectively (Table 2).

Factors influencing maternal satisfaction and acceptability of breastfeeding support

There were 11 exit questionnaires returned, (intervention n=5, control n=6). Women were asked 5 Likert-scale questions (Table 3). The intervention participants felt they were encouraged by staff to breastfeed and demonstrated an increased level of satisfaction and confidence with breastfeeding. The control group had a greater reticence to ask for assistance and felt less supported.

The questionnaire asked 'what was good about breastfeeding support and what could be improved?' Thematic analysis generated five key themes relating to breastfeeding support and substance exposure. These were the influence of (i) breastfeeding skill and knowledge (ii) psychological factors (iii) person-centred approach (iv) environmental modifications and (v) postnatal experience on breastfeeding.

*Theme 1: Influence of breastfeeding skill and knowledge*

This theme concerned 'how to' breastfeed and included information on the normal physiology breastfeeding process and specific advice on the impact of substance dependence on breastfeeding.

The physical difficulties of breastfeeding an infant experiencing withdrawal, particularly positioning and latching to the breast, was a major concern. The three mothers who discontinued breastfeeding all mentioned difficulties with latch/attachment as a determining factor with one mother reporting her baby was 'too agitated' to latch whilst another mother felt that her baby was 'too sleepy'. Overwhelmingly, the practical aspects of infant feeding drew the most responses from both the intervention and control groups:

"Showing me the rugby ball position which I found much easier"

(Intervention)

“Helped me latch on when struggling with different positions”

(Control)

Access to a support worker resonated as a key advantage among the intervention group. The value of additional support was emphasised and the scheduled visits were considered as a ‘safety net’ should they be needed:

“I was really pleased with the extra support of a worker coming in and helping me as the midwives on duty are very busy and sometimes can’t help.”

(Intervention)

“Having someone here for me just in case was a great thing.”

(Intervention)

Advice and information provision were viewed as an essential component of support but mixed experiences were reported:

“The staff are amazing, patient and kept me well informed.”

(Intervention)

However, respondents felt that whilst generic breastfeeding information was important this lacked sufficient relevance for their situation:

“I have had plenty of advice and encouragement about breast feeding from hospital staff but not very much advice or information about babies with symptoms of neonatal abstinence syndrome.”

(Control)

### *Theme 2: Influence of psychological factors on breastfeeding support*

This included the need for emotional support to sustain breastfeeding and the importance of positive reassurance and encouragement.

“The five days was very positive and having someone here for me encouraging me daily was brilliant.”

(Intervention)

Additionally, practitioner attitudes and non-verbal behaviour influenced the mother's emotional well-being. Conveying a relaxed, positive demeanour returned a similar attitude by the participant.

“when (support worker) came to help us she was great, she had a wide knowledge and was very laid back, made things feel so simple and natural”  
(Intervention)

*Theme 3: Influence of person-centred approach on breastfeeding support*

The person-centred approach focussed on providing individualised and socio-culturally relevant support. Having a dedicated support worker and time allocated exclusively for the individualised needs of mother and baby was viewed as beneficial:

“Knowing someone was coming to help me every morning was ace.”  
(Intervention)

This included identifying the level and type of support required and tailoring the daily sessions accordingly:

“To be honest my baby latched on with no problems at all, so didn't need any help at all but I was asked if I wanted any help.”  
(Intervention)

*Theme 4: Influence of environmental modifications*

Environmental conditions were integral for effective neonatal supportive care and the inability to reduce external stimuli was cited as a negative feature of the postnatal experience:

“I was on a ward with 4 other lady's & 4 other babies. It was a bit impossible to create a quiet environment especially at visiting time. There is no way I could have dimmed lights for my baby.”  
(Control)

Whilst another mother was not informed about consolation techniques during her hospital stay:

“I only know of swaddling through talking with my community midwife before being admitted to hospital”.

(Control)

*Theme 5: Influence of postnatal experience on breastfeeding support*

Postnatal experience relates to health care practices and attitudes which may not be directly connected to support but can influence maternal receptiveness to support.

These focussed on issues of privacy, confidentiality and respectful practice. With the lack of confidentiality, particularly when discussing substance use, a major failing.

“I found it wasn’t very private and some of the staff were quite “easy” to discuss confidential matters openly without a thought for who might be listening on the other side of the curtains.”

(Control)

One mother felt confident establishing breastfeeding while in single accommodation, however, following transfer to the neonatal unit, the lack of privacy negatively affected her breastfeeding experience:

“I didn’t feel comfortable breastfeeding in front of other visitors, even with the screen it always felt too busy which made me wait until late feeds when it was quiet to feed.”

(Intervention)

## **Discussion**

The study explored the feasibility of tailored breastfeeding support for the substance exposed mother and baby. The ability to recruit from a group considered difficult to engage was used as a measure of feasibility and although the initial recruitment was modest, retention of participants during the study was encouraging. There was a demonstrated trend for continued breastfeeding on the 5<sup>th</sup> postnatal day and

intervention participants reported increased breastfeeding confidence and satisfaction. Breastfed infants were less likely to require pharmacotherapy for neonatal withdrawal and had a shorter hospital stay. Collectively, the findings indicate the potential of the support model to improve both maternal and neonatal outcomes.

Study recruitment was anticipated as a possible challenge. Historically breastfeeding was contra-indicated for those with a substance addiction and despite the reversal of this restriction, breastfeeding rates remain below national averages (3). Some medical facilities continue to report discouraging attitudes to breastfeeding inclusion for opiate maintained women and a national survey noted practitioners consistently displaying negative views towards the promotion and support of breastfeeding for infants at risk of abstinence syndrome (19, 20). These factors may have played a part in the small number of women forwarded as eligible for participation in our study. Encouragingly, a recent large-scale hospital evaluation reported that the percentage of substance exposed infants receiving breast milk increased from 20% in 2004–2005 to 35% by 2012–2013 (25). These findings imply that there is a gradual reversal in attitudes with women and health care professionals now actively responding to, and receptive of, breastfeeding promotion in conjunction with substance addiction.

The intervention participants had higher breastfeeding rates and expressed a greater confidence in their breastfeeding ability than the control group. However, there was a disparity in prior breastfeeding experience between the two groups and as previous positive or negative breastfeeding experience can be a modifying factor in a subsequent pregnancy this must be considered in the evaluation (14). In support, the



study findings do correlate with existing research conducted with women of various demographics, which indicates that all forms of extra support may increase the duration of either exclusive or continued breastfeeding (26). Contrastingly, previous studies have reported variability in the acceptability and perceived efficacy of the same breastfeeding support initiative when delivered to socio-demographically similar groups but in different settings (27). These contradictions highlight the influence of both context and personal choice on breastfeeding decisions. This resonates with the study finding that health care practices and practitioner actions and attitudes were an influencing factor on maternal postnatal experience. Negative experiences, such as a perceived lack of privacy and compromised confidentiality, can be devastating for this group in terms of loss of trust and fear of being stigmatised by others. Trust and confidence in the health care system as a whole can be jeopardised, impeding the establishment of a rapport between the mother and practitioner and indirectly, maternal receptiveness to breastfeeding advice (28). Given the current paucity of research regarding breastfeeding and substance dependence, and the inconsistency of how support is perceived by individuals and homogenous groups, further exploration of the beliefs and attitudes of opioid dependent women is warranted.

Our finding that breastfed infants displayed a milder course of neonatal withdrawal is consistent with prior studies (10). For example, a prospective case control study and several retrospective chart reviews have consistently shown that breastfeeding alleviates withdrawal severity (11, 12, 18). None of these studies however, used a randomized controlled design highlighting the need for robust evaluation of infant feeding and substance dependence.

This study evaluated an integrated model offering a novel approach to the management of neonatal withdrawal by incorporating breastfeeding, a supportive environment and fostered maternal capacity building. A previously reported study promoted a low stimulation environment and encouraged parents as partners in care-giving as a means of alleviating withdrawal severity, but this did not include specific breastfeeding support (29). Similarly, other research has concentrated on increasing family involvement in the delivery of non-pharmaceutical therapy and a 'care bundle' approach to management (30, 31). These studies assessed intervention efficacy in terms of hospital duration and /or health care costs, and all demonstrated an improvement. It could be argued, therefore, that a model including family focused care which collaboratively fosters a therapeutic mother/child relationship and places breastfeeding at its centre should also improve clinical and economic outcomes.

#### Strengths and Limitations

A strength of the study is the prospective nature of the evaluation and the unique use of a randomized controlled trial design in this context. With the paucity of similar controlled trials, a benefit of the current research is the generation of data to inform the parameters of a future statistically powered study.

A number of limitations should be acknowledged when interpreting the study findings. The study used a single site only, recruiting from one substance dependence clinic, and there was homogeneity of the population. Whilst the sample group was not dissimilar to other studies conducted amongst substance dependent mothers in Scotland, it is accepted that the research may not be representative of other geographic settings or where health service provision differs (32).

## **Conclusion**

This study highlights the feasibility and potential benefits of tailored breastfeeding support for the substance exposed mother and baby. However, the small sample size limits our ability to comment on clinical efficacy. Future research should include a statistically powered, blinded, randomized trial to evaluate clinical efficacy.

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**Table 1**

*Mixed methods feasibility study of breastfeeding support in substance dependence: Maternal and neonatal participant characteristics, Scotland, 2015.*

		Intervention	Control	Total
		n=7	n=7	n=14
Characteristics		n (%)	n (%)	n (%)
<b>MATERNAL</b>				
Age (years)	20-35	5(71)	4(57)	9(64)
	>35	2(29)	3(43)	5(36)
Parity	nulliparous	1(14)	3(43)	4(28)
	multiparous	6(84)	4(57)	10(71)
Substitution Medication	methadone	7(100)	6(84)	13(93)
	buprenorphine	0	1(14)	1(7)
Prior breast Feeding	yes	4(57)	1(14)	5(36)
	no	3(43)	6(84)	9(64)
Birth Outcome	spontaneous	4(57)	4(57)	8(57)
	assisted*	3(43)	3(43)	6(43)
<b>NEONATAL</b>				
Gestation (weeks+days)		38+3-41+4	36+6-41+0	36+6-41+4
Birth weight (kg)		3.0 – 3.9	2.8 – 3.8	2.8-3.9
Feeding @ Day 5	breastfeeding	7(100)	4(57)	11(79)
	formula	0	3(43)	3(21)
Pharmacotherapy	yes	2(29)	4(57)	6(43)
	no	5(71)	3(43)	8(43)
Length of hospital stay		5-24	7-43	5-43
Mean±SD		10.5±7.0	19.4±13.0	14.9±11.1

*\*Assisted birth includes instrumental and operative delivery*



**Table 2**

*Mixed methods feasibility study of breastfeeding support in substance dependence: pharmacotherapy and length of hospital stay for infants at risk of Neonatal Abstinence Syndrome by infant feeding method, Scotland 2015.*

Neonatal Abstinence Severity		Breastfeeding	Formula
		N=11	N=3
		n (%)	n (%)
		Mean±SD	Mean±SD
Pharmacotherapy	Yes	3(21.5)	3(21.5)
	No	8(57)	0
Length of hospital stay range(days)		5-22 10.8± 6.7	20-43 30.0± 11.8

**Table 3**

*Mixed methods feasibility study of breastfeeding support in substance dependence: maternal questionnaire, Scotland 2015.*

	Intervention	Control	Total
	n=5	n=6	N=11
Likert question**	Mean±SD	Mean±SD	Mean±SD
Staff encouraged me to breastfeed	9.0± 2.2	6.4± 2.9	7.7± 2.8
I asked for help when I needed support	8.8± 1.1	5.4± 3.7	7.1± 3.1
I always received help when I asked for it	9.2± 1.3	6.4± 2.3	7.8± 2.3
I am satisfied with the support I was given in hospital	9.6± 0.9	6.8± 2.2	8.2± 2.2
I feel confident breastfeeding	9.0± 1.7	4.3± 2.1	6.9± 3.1

\*\* Likert score 1 (completely disagree) to 10 (completely agree)