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Pilot test of a home-based program to prevent perceived insufficient milk[☆]

Natsuko K. Wood^{d,*}, Elizabeth A. Sanders^a, Frances M. Lewis^b, Nancy F. Woods^c,
Susan T. Blackburn^b

^a Educational Psychology, Measurement & Statistics, The University of Washington, Seattle, WA, USA

^b Family and Child Nursing, The University of Washington, Seattle, WA, USA

^c Biobehavioral Nursing and Health Systems, The University of Washington, Seattle, WA, USA

^d Skagit Valley College, 2405 East College Way, Mount Vernon, WA 98273, USA

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ABSTRACT

Problem: Although the World Health Organization and American Academy of Pediatrics recommend exclusive breastfeeding for the first six months, only 22% of U.S. mothers do so. Mothers' perceived insufficient milk (PIM) is the primary reason for breastfeeding discontinuation globally. There are two changeable causes of PIM: (1) mothers' misinterpretation of their infant's behavior, and (2) mothers' lack of confidence in their ability to breastfeed.

Aim: The purpose of this study was to evaluate the short-term effect of a home-based intervention designed to prevent and/or reduce PIM.

Methods: A mixed-methods, single-group, pretest-midtest-posttest design was used for evaluating a home-based breastfeeding program. The program was implemented during three 1.0- to 1.5-h home intervention sessions at 6, 13, and 27 days postpartum, delivered to 14 dyads of breastfeeding mothers and their full-term singleton infants.

Findings: We found significant increases over time in mothers' sensitivity to infant behavior and breastfeeding self-efficacy as well as significant decreased attribution of infant crying to PIM. Exit interviews indicated that the program was accepted by participating mothers.

Discussion: This is the first intervention study that has directly targeted the causes of PIM. The home-based intervention has the potential to add to maternal competencies both in correctly assessing their infants' behavior, thereby preventing erroneous attribution of infant behavior to PIM, as well as simultaneously bolstering maternal confidence in breastfeeding skills.

Conclusion: By building maternal competencies, the home-based intervention has a longer-range potential to prevent breastfeeding discontinuation. Further evaluation is warranted.

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Statement of significance

Problem or issue

Infant crying is the main symptom that mothers use to quantify their milk supply, leading to perceived insufficient milk (PIM).

What is already known

There are two changeable causes of PIM: (1) mothers' misinterpretation of their infant's behavior, and (2) mothers' lack of confidence in their ability to breastfeed.

What this paper adds

A three-visit home-based intervention has the potential to add to maternal competencies in assessing their infants' behavior, thereby preventing erroneous attribution to PIM.

[☆] Institution where the work was done: University of Washington School of Nursing, Box 357260 Seattle, WA 98195, USA.

* Corresponding author. Fax: +1 360 416 6596.

E-mail address: natsuko.wood@skagit.edu (N.K. Wood).

1. Introduction

It is now well-established that exclusive breastfeeding is related to numerous benefits for mothers and infants. For infants this includes better passive immunity against a wide range of infectious diseases, decreased allergic reactions, and prevention of sudden infant death syndrome (SIDS), obesity, Types I and II diabetes, and childhood leukemia; for mothers, benefits include child spacing through lactation amenorrhea, weight loss to pre-pregnancy size, and decreased chance of developing Type II diabetes, breast cancer, ovarian cancer, and postpartum depression.^{1,2} In addition, exclusive breastfeeding on the breast promotes increased bonding through mother–infant interactions.³ According to the results of the 2013 cohort of the National Immunization Survey, the breastfeeding initiation rate in the United States was 81%; despite this impressive number, *exclusive* breastfeeding has declined, reaching an estimated 57% by 28 days postpartum and 22% by six months postpartum.⁴ This is in stark contrast to the strong recommendation that mothers employ exclusive breastfeeding directly on the breast or breast milk feeding via other methods (such as pumped breast milk via bottle feeding) for the first six months postpartum.^{5,6}

Perceived insufficient milk (PIM) is the most common reason for early breastfeeding discontinuation globally.^{7–19} Cross-cultural studies have shown that mothers typically report PIM within the first 1–2 weeks postpartum, and it continues to be a primary concern throughout the course of breastfeeding regardless of infant age.^{7–10} Research has also shown that the two most common explanations that mothers attribute to PIM are infant crying and fussiness.^{11–13} Other commonly cited reasons for PIM include the belief that their infant is not gaining enough weight^{10,14} and/or that the infant is feeding too often.^{15,16} In summary, mothers may quite reasonably draw the conclusion that their infant is hungry and unhappy because they believe that they are not producing enough milk. In turn, mothers themselves can feel an increased sense of anxiety over their infant's crying, believing it results from a low milk supply. Logically then, mothers with PIM may begin formula feeding.^{17–19}

Unfortunately, formula feeding can become a vicious cycle. It can interfere with maternal breast milk supply because breastfeeding is biologically a supply-and-demand process. For mothers to be able to produce copious amount of breast milk for their infant, both infant suckling directly on the breast, along with breast milk removal from the breast, are required before, during, and after lactogenesis stage II, which usually starts on Day 2 or 3 until Day 8 postpartum with typical vaginal birth. (We note that delayed onset of lactation (>72 h postpartum) is expected in mothers who either had a vaginal birth with prolonged stage II,²⁰ or a C-section.²¹) When a mother begins formula feeding, there is a marked decrease in the frequency of infant suckling on the breast as well as a lack of breast milk removal. Ultimately, the breast milk supply becomes decreased²² and results in the inability to establish exclusive breastfeeding on the breast.

Importantly, mothers' perception that their milk supply is low is not necessarily true; rather, it is a conclusion that mothers can draw in specific contexts. Prior research has been focused on better understanding PIM has shown that mothers with high self-confidence in their breastfeeding ability are significantly less likely to experience PIM.^{23,24} For example, in a quasi-experimental study in Australia focused on PIM, mothers who received teaching focused on understanding their bodies and breastfeeding self-efficacy to understand they have adequate milk supply were found to significantly lower breastfeeding discontinuation rates at 1, 4, and 6 months postpartum.²⁵ Further, two randomized experiments have shown that bolstering mothers' self-confidence in breastfeeding via perinatal workshops can improve duration of

breastfeeding.^{26,27} Despite this work, mothers' perception of infant behavior has remained an unresolved issue for decreasing PIM,²⁸ particularly with regard to interpreting infant crying behavior.²⁹ It stands to reason that, without knowing how much breast milk her infant is actually receiving, it is difficult to dispel a mother's worry that her supply might be inadequate. A community-based randomized controlled trial³⁰ evaluating the efficacy of the use of home breastfeeding interventions followed by the support by trained nurses at the community center failed to increase mothers' breast milk feeding at 3, 4, and 6 months postpartum. This is likely caused by a combination of the lack of understanding of the changeable causes of the problem, theoretical guidance, and holding stringent intervention fidelity checks. The present study thus seeks to fill this gap, at least partially, by pilot-testing a novel home-based program designed to not only assist mothers' self-efficacy in breastfeeding her infant, but also to adequately assess her milk supply contingent to her infant behavior with specific skills—both as a means of combating the potential for PIM to develop in breastfeeding mothers.

2. Conceptual framework for study

The conceptual framework of this study is based on Bandura's social cognitive theory,^{31–33} Mercer's theory of becoming a mother,³⁴ and Barnard's model of early mother and infant interaction.³⁵ Social cognitive theory^{31–33} emphasizes behavioral capability and self-efficacy. **Behavioral capability** encompasses both the knowledge and skills to be able to carry out a behavior, whereas **self-efficacy** is confidence in one's ability to perform that behavior. Self-efficacy can be improved via *vicarious learning* (the individual can watch the behavior being modeled for them), *performance enactment* (the individual can try out the behavior), *persuasion* (the individual can be provided with a logical reason for enacting the behavior), and *minimum emotional arousal during learning* (the individual can be provided with an environment that is not stressful for optimizing attentional capacity for learning).

According to social cognitive theory, the optimal sequence for improving self-efficacy is two-fold: by both behavioral capability as well as practice in behavior performance enactment. Although behavioral capability (knowledge and skills) is necessary for improving self-efficacy, it is not sufficient. To achieve high self-efficacy, individuals must also practice the behavior themselves, and optimally in the presence of professional feedback. Then, once self-efficacy is established, individuals can perform the new behavior even in a difficult, stressful situation. Finally, social cognitive theory also explains outcome expectation as an individual's effort to achieve a behavioral goal (e.g., exclusive breastfeeding for the first six months postpartum), and their outcome expectancy as they will choose the new behavior over other alternatives (e.g., breastfeeding on the breast over other types and methods of feeding). In sum, if mothers are afforded breastfeeding knowledge and skills in breastfeeding as well as practice in breastfeeding methods guided by professionals (e.g., lactation consultant nurses), social cognitive theory would predict that mothers' self-efficacy would be improved, thereby improving her interpretation of her infant's behaviors as unrelated to her personal breast milk supply. In turn, PIM would diminish and breastfeeding exclusivity and duration would improve.

According to maternal readiness to learn theory, mothers are ready to learn about their infant's behavior during the first 2–6 weeks postpartum.³⁴ During mothers' physical recovery after childbirth, her primary focus is on infant care. Even though she may be prone to dramatically changing moods and feelings, this is the optimal time to learn childrearing knowledge and skills. Professional support can not only support mothers in becoming sensitive to her infant's needs, but can also assist mothers in

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