Factors affecting the implementation of effective interventions to support women to breastfeed: a systematic review and mixed methods synthesis

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history and psychosocial measures. Mothers were also asked which trust they delivered at and this was coded according to BFHI accreditation information (full accreditation, partial accreditation, or no accreditation).

Findings: Results showed significant improvements in breastfeeding initiation within an hour of birth for women delivering in fully BFHI accredited hospitals, but no significant improvements for longer-term breastfeeding outcomes and psychological wellbeing outcomes, compared to those delivering in hospitals with partial accreditation, and those delivering in hospitals with no accreditation.

Conclusion: This study reflects the findings of similar research into the impact of the BFHI in resource-rich settings which suggest the BFHI may not improve breastfeeding rates (beyond the first hour of birth) or maternal wellbeing, both being underpinning principles of the initiative. Further research is needed to develop a clearer understanding of the UK BFHI and its impact and to ensure the design and implementation of the initiative delivers optimal care for all mothers and infants in the UK.

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Factors affecting the implementation of effective interventions to support women to breastfeed: A systematic review and mixed methods synthesis

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Background: Existing evidence suggests that when standalone breastfeeding support interventions are offered to women who choose to breastfeed, the duration and exclusivity of breastfeeding are likely to be increased (Gavine et al., 2022). However, many women in the UK and elsewhere continue to report that lack of adequate breastfeeding support results in them stopping breastfeeding earlier than planned. Therefore, one key research question is now to identify how known effective interventions can successfully be implemented in practice.

As part of the of the Action4Breastfeeding study, this review aimed to synthesise existing evidence on factors affecting the implementation of effective interventions identified in the updated Cochrane review on breastfeeding support for healthy women with healthy term babies (Gavine et al., 2022).

Methods: We systematically searched six bibliographic databases. Citation and reference searches of outcome papers from known effective interventions were also undertaken. No restrictions were applied on publication date and language. Articles reporting relevant qualitative and/or quantitative research were included. Quality appraisal was undertaken following study selection. Qualitative data were synthesised thematically (Thomas & Harden, 2008), and quantitative data narratively (Popay et al., 2006). A cross-study synthesis (Kavanagh et al., 2012) integrated qualitative and quantitative findings.

Findings: Sixteen articles were included in the final synthesis. A range of eighteen factors affecting the implementation of effective interventions were identified and grouped around five broad types of implementation factors. The types of factors with a more widespread evidence base were related to the implementation process (particularly those relating to the ability to monitor and collect quantitative and qualitative feedback about the progress and quality of implementation) followed by those relating to the external context of the implementing organisation (particularly in terms of the organisation's knowledge of their women's/families' breastfeeding support needs).

Conclusion: Available evidence on the range of factors known to have impacted implementation of effective breastfeeding support interventions can inform guidance for organisations to develop robust implementation strategies which may be more likely to ensure successful implementation of evidence into practice.

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Macronutrient variance in Human Donor Milk: Implications for Fragile Infants

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Background: Human milk is known to be the best source of nutrients for human infants, particularly preterm infants. (Lewis et al., 2017). When a mother's own milk is not available donor human milk is an alternative. (Ellsworth, Sturza, and Stanley 2021) Donor human milk (DHM) is categorized by caloric quantity, typically 20 calories per ounce and 24 calories per ounce. The DHM is prepared for distribution in lots or batches. (Moro et al., 2019). This study analyzed multiple Lots from one milk bank for macronutrient content to evaluate the range of macronutrient and energy content within and between Lot samples.

Methods: Frozen DHM was collected from a local hospital neonatal intensive care unit. Samples were chosen randomly from each Lot of either 20 kcal/ounce or 24 kcal/ounce. Each bottle was thawed and warmed to 40 degrees Celsius. Each sample was ultrasonically homogenized, and 3 3-ml aliquots were removed from each bottle with 150 samples analyzed. The triplicate samples were analyzed using a MIRIS human milk analyzer. Descriptive statistics were calculated in Excel as well as multinominal regression, and ANOVA based on the expected energy density in relation to these macronutrient values. P values < 0.05 was considered statistically significant.

Results: Highly statistically significant differences were found within and between lots of the DHM. Protein content differed in 58% of the samples from the protein content listed on the label by more than 0.03 g/dl. The energy content differed from the label in 72% of the samples with an average difference of more than 3 units.

Conclusions: Differences have been reported between milk banks. (Jo et al., 2020). In this study, the differences found in macronutrient content between and within the Lots may pose a challenge for consistency of calorie intake in infants receiving only DHM if the energy content is assumed based on the labeling. Due to the differences found in this analysis, the nutrient intake may not meet the needs of an ill or fragile infant being fed DHM. Samples of DHM being fed to high-risk infants should be regularly evaluated for macronutrient content to ensure the adequacy of the feeds.

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Lactation Physiokinetics: Using new technology for a new perspective

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Background: While breastfeeding initiation has increased, little progress has been made to increase the duration of exclusive breastfeeding of infants. (Survey, n.d.) New tools and techniques are needed to identify the specific problems and facilitate the development of personalized, precise, and targeted interventions when breastfeeding begins to fail. (Lee & Kelleher, 2016). The incomplete understanding of the physiokinetics of human milk transfer drives the current lack of evidence-based interventions, resulting in only slight progress in increasing the number of months infants are breastfed. Despite the critical nature of breastfeeding, there is little understanding of the underlying physiological and biomechanical systems that lead to inadequate or complete failure of milk transfer.

Methods: Using Systems Biology (Breitling, 2010) and Systems Medicine (Saqi et al., 2016) as the framework, combined with Engineering design principles, a new tool using biosensors is being developed to describe and physically map milk movement from breast to infant's stomach, in real-time, identifying points of regulation throughout the maternal-infant lactation physiokinetics (MILK) system. The biosensor array, or BAR, is used to identify potential points of malfunction and map the features of the MILK system. The initial model of the MILK system included 8 maternal variables and 8 infant variables, most of which are measured synchronously using biosensors.

Results: All sensing elements of the MILK BAR are low-cost, robust, and biocompatible to meet operational demands. Multiple sensor channels have been integrated for each use on mom and infant. Several regulatory factors have been identified and quantified that