

Effects of Family-Centered Care Versus Mobile-Enhanced Family Integrated Care on Preterm Infant and Maternal Outcomes: A Quasi-Experimental, Time-Lagged Study

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Background

- Family-Centered Care (FCC)** for preterm infants has a strong evidence base yet remains inconsistently implemented. There is a lack of consensus on how best to achieve full parent partnership in the NICU setting. For example, NICUs often use the slogan 'family-centered care' to indicate a NICU merely has permissive "visiting" hours or to indicate the NICU has extensive programming for parent and family support.
- Family Integrated Care (FiCare)** is based on FCC principles. FiCare provides a structured, parent co-designed program of NICU care delivery. Parents become primary caregivers and full partners in care planning/ caregiving for their infant. FiCare provides a well-structured, yet flexible unit-level, parent-partnered framework for NICU care delivery.
- Improved outcomes have been demonstrated in research from multiple countries for preterm infants and families when NICUs provide FiCare compared with FCC. These include better feeding, weight gain, post-discharge neurodevelopment and decreased risk of sepsis for infants; improved mental health and infant interaction during and after the NICU stay for parents.

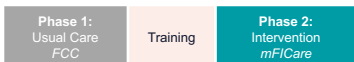
Adoption of FiCare in the United States (US) has been slow.

Objective

We aimed to compare the effects of FCC with mobile-enhanced FiCare (mFiCare) on growth and major morbidities of preterm infants and mental health of parents from three diverse NICUs. We also examined feasibility and acceptability of the program (data not shown).

Methods

A quasi-experimental, time-lagged, 2-phase study design was used to prospectively enroll parent/infant dyads to receive either usual FCC or mFiCare. Eligible infants were \leq 33 weeks gestation at birth.



- Primary outcome: infant standardized weight gain (study days 1-22).
- Secondary outcomes: nosocomial infections, bronchopulmonary dysplasia, retinopathy of prematurity, and human milk feeding at discharge.
- Intention-to-treat and per-protocol effects evaluated using linear mixed models and logistic regression.

Intervention

The (m)FiCare Bundle

- Supportive physical environment/co-designed protocols/policies
- Clinical team and alumni parent mentor training
- Parent participation in weekday rounds
- Parent peer mentorship
- Parent group classes 2-5 times per week
- Expanded role for parents in infant caregiving
- Parent mobile app: FiCare content, online diary
- Parents offered all components of the mFiCare bundle
- Monthly intervention fidelity audits and 'booster' training and support

Usual FCC Group:

- Usual FCC as defined by each site, general encouragement of parent participation in infant caregiving
- Parent mobile app: online diary only

Results

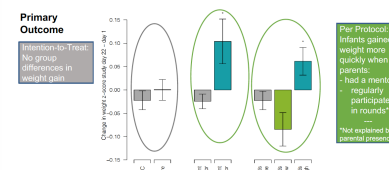
- Racially/ethnically diverse sample – 77% BIPOC
- Younger and smaller sample than previous studies
- Enrollment rates: 59% FCC, 71% mFiCare
- Retention rates: 97-98%
- No baseline group differences; No group differences in clinical or discharge characteristics; Sicker and more complex care than previous studies
- No adverse events from increased parent involvement with the mFiCare model

Sample:

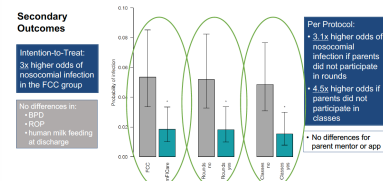
Characteristics* (N=253)	FCC (n=141)	mFiCare (n=112)	p
GA, wks	28.8 (2.8)	28.5 (2.5)	.92
Birthweight, grams	1194 (470)	1182 (462)	.85
SGA	9% (13)	10% (11)	.87
Outborn	33% (46)	29% (32)	.49
Multiple birth	13% (19)	19% (21)	.19
Appar score, 5 min	7 (1.8)	7 (2.1)	.84
Clinical characteristics			
Ventilation in NICU	55% (77)	59% (66)	.49
Any surgeries	26% (36)	25% (28)	.87
Discharge characteristics			
Length of hospital stay, days	74 (52)	84 (55)	.14
Discharged with:			
Respiratory device	20% (28)	23% (26)	.52
Feeding device	19% (26)	24% (27)	.28

Results (cont.)

Infant Outcomes:



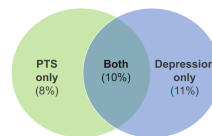
- Infant whose parents were mentor-paired or participated in >80% of weekday rounds gained more weight



- The mFiCare infants had lower adjusted nosocomial infection rates
- Infants whose parents participated in >2 rounds or participated in >1 class had lower odds of nosocomial infection

Maternal post-discharge outcomes:

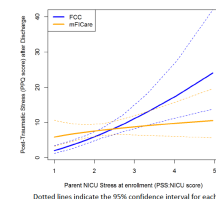
29% of mothers had symptoms of post-traumatic stress, depression or both



PTS and depression levels similar in FCC and mFiCare groups (n=89 each group)

Results (cont.)

Maternal post-discharge outcomes:



- Mothers who experienced high NICU stress and participated in mFiCare had fewer post-traumatic stress symptoms and depression (not shown) about 3 months after discharge than those who participated in FCC.

Discussion

- mFiCare can be delivered safely in the US health care context to racially/ethnically diverse families with very ill preterm infants.
- Mobile app technology may increase intervention access for families who otherwise might be unable to participate in the in-person intervention components, and to engage parents to track their participation in specific intervention components.
- The mFiCare group had substantially lower nosocomial infection rates
- Specific mFiCare components: parent peer mentorship, active participation in weekday clinical rounds and parent classes may individually improve weight gain and lower infection risk.
- mFiCare as a model of care, or its specific components, should be implemented in US NICUs to improve quality and safety.
- Further research on the immediate and long-term outcomes of mFiCare in US NICUs is needed.

References

- Franck et al. BMC Pediatrics (2022) 22:674 <https://doi.org/10.1186/s12887-022-03732-1>
- Franck et al. Clin Perinatol 2023 <https://doi.org/10.1016/j.clp.2023.01.007>
- FiCare training and implementation resources: <https://familyintegratedcare.com>