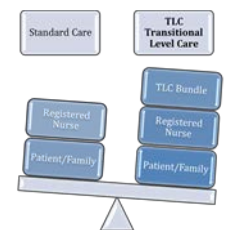


Impact of Parental Involvement in Mindfulness-Based Neurodevelopmental Care on Parent Stress and Parent-Infant Bonding in the NICU: A Randomized Trial

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Objectives

- Upon completion of this presentation, learners will be able to:
 - Evaluate the importance of mindfulness-based care and parent involvement in mindfulness-based neurodevelopmental NICU care
 - Understand the impact of mindfulness-based neurodevelopmental NICU care on parent stress and infant length of stay
 - Utilize simple mindfulness-based stress reduction strategies in their personal and/or professional lives.

BACKGROUND

- Approximately 1 in 10 infants require NICU care
- NICU admission results in parent-infant separation and stress
- Physical separation and stress may lead to or contribute to poor long term outcomes
- Mindfulness practice may help to alleviate stress & improve health

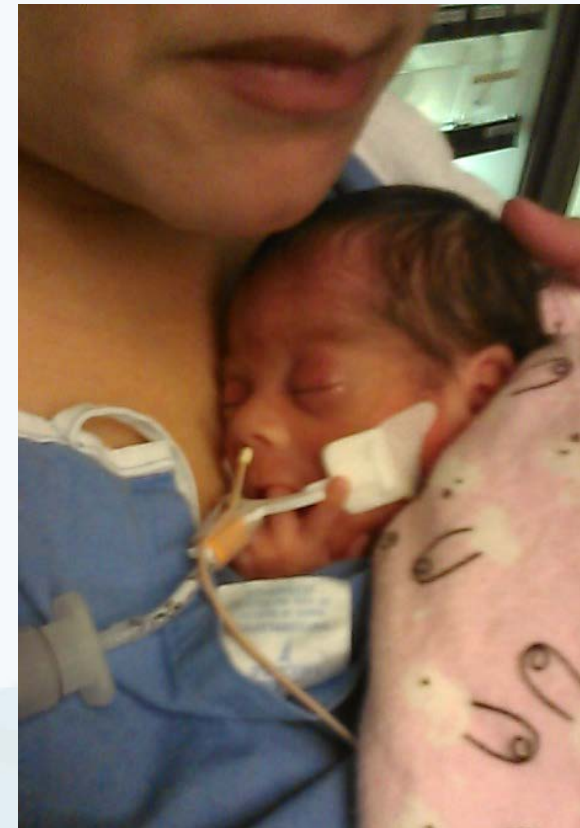


Study Purpose:

Examine the impact of parental involvement in mindfulness-based neurodevelopmental care on parental stress and parent-infant bonding in the NICU

Aims:

- **Primary aims:**
 - NICU parent stress
 - NICU parent-infant bonding
- **Secondary aims:**
 - NICU parent satisfaction
 - NICU infant length of hospital stay



- Randomized Controlled Trial (1:1 Basis)
 - Convenience sample of NICU parents
 - Experimental Group: participates in mindfulness-based neurodevelopmental care training and receives follow-up every other week
 - Control Group: receives standard NICU care
- Inclusion/Exclusion Criteria:
 - Inclusion: Parents of hospitalized NICU infants with birth gestational age of <35 weeks and expected length of stay >14 days
 - Exclusion: Parents who are unable to speak or write in the English language

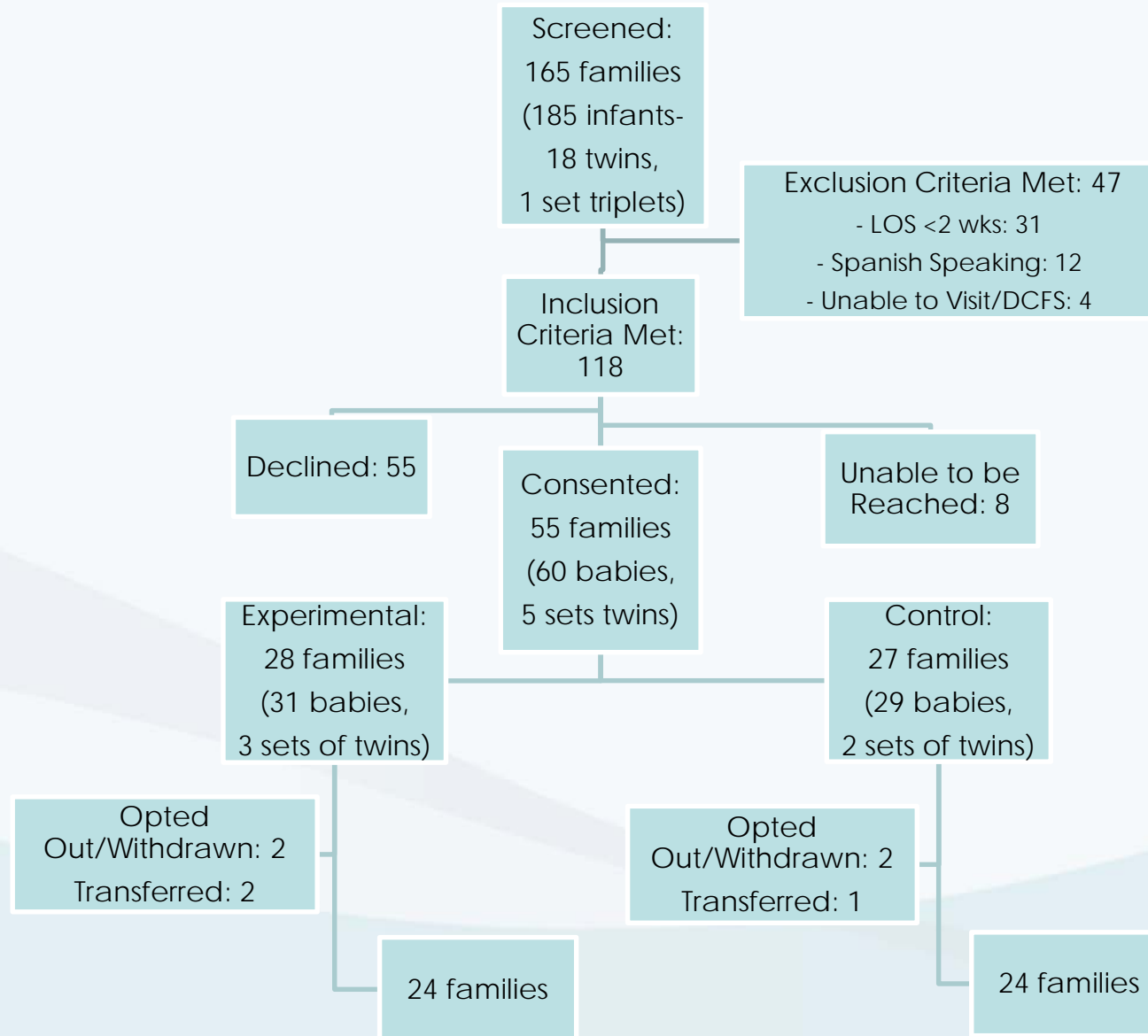
- Randomized Controlled Trial (1:1 Basis)
 - Convenience sample
 - Experimental Group: participates in mindfulness-based neurodevelopmental care training and receives follow-up every other week
 - Control Group: receives standard NICU care
- Inclusion Criteria:
 - NICU parent
 - Infant birth GA <35 wks
 - Anticipated LOS >14 days
- Exclusion Criteria:
 - Non-English speaking



- Demographic Forms*:
 - Parent Demographics: age, gender, ethnicity, etc.
 - Infant Clinical Data: birth & discharge gestational age, birth weight, delivery type, diagnoses, LOS, etc.
- Parental Stressor Scale: NICU (PSSNICU): a 26 item likert scale instrument containing 3 subscales measuring stress (NICU environment, infant appearance/behavior, parental role alterations).
- Mother-to-Infant Bonding Score: an 8 item likert scale measuring parent bonding emotions in 1st weeks of life.
- Satisfaction Scale*: 2 items (1 likert scale satisfaction rating, 1 open-ended response item)
- Parent-Infant Activity Logs*

*tools created by study investigators

STUDY ENROLLMENT



Parent Demographic Data

Valid % or mean (SD)	Overall (N=55)	Experimental / Mindful Group (N=28)	Control Group (N=27)	p-value
	N=44	N=24	N=20	
Age, years	30.2 (6.6)	31.5 (6.4)	28.7 (6.8)	P=0.173
Relationship to Infant:				
Mother	83.7%	79.2%	89.5%	P=0.363
Father or Both	16.3%	20.8%	10.5%	
Parent reports history of Depression/Anxiety	16.7%	30.4%	0.0%	P=0.009

Significant difference in reported hx of depression/anxiety.

No significant differences noted in ethnicity, education, religious affiliation, marital status, number of additional children, or insurance.

Infant Clinical Data

Valid % or mean (SD)	Total Study Sample (N=60) <i>(data with outlier removed)</i>	Experimental/Mindful Group (N=31) <i>(data with outlier removed)</i>	Control Group (N=29)	p-value
	N=60	N=31	N=29	
Birth Gestational Age (weeks), mean (SD)	29.2 (3.3)	29.9 (3.0)	28.4 (3.4)	P=0.081
Birth weight (grams), mean (SD)	1332.6 (533.8) <i>1339.9 (535.3)</i>	1468.5 (527.3) <i>1487.5 (525.5)</i>	1187.2 (510.1)	P=0.040 P=0.030

Statistically significant differences noted in birth weight (w/ and w/o outlier removed).

No significant differences in delivery method, gestational age, gender, etc.

RESULTS- Stress

Primary Aims Evaluations: Stress

mean (SD)	Mindful/Experimental Group (N= 28)		Control Group (N= 27)		P-Value
	Valid N	Mean (SD)	Valid N	Mean (SD)	
PSS:NICU @Enrollment	N=24	2.9 (1.4)	N=20	2.4 (1.7)	P=0.214
PSS:NICU @Discharge	N=17	1.8 (1.6)	N=18	2.0 (1.6)	P=0.648
Change in PSS:NICU score (Enroll – DC)	N=13	-1.1 (2.2) p-value = 0.012	N=11	-0.4 (2.0) p-value = 0.285	P=0.210

Stress: No statistically significant differences between groups.

However mindful parents experienced a significant decrease in stress scores (from enrollment to discharge, while control parents did not).

PSS:NICU Subscale #3- Parental Role Alterations

mean (SD)	Experimental/ Mindful Group (N=28)		Control Group (N=27)		P-Value
	Valid N	Mean (SD)	Valid N	Mean (SD)	
PSS:NICU SS #3 @Enrollment	N=24	3.2 (1.8)	N=20	2.8 (2.0)	P= 0.428
PSS:NICU SS #3 @Discharge	N=17	2.0 (1.8)	N=18	2.3 (1.9)	P= 0.502
Change in PSS:NICU SS #3 score (Enroll – DC)	N=13	-1.2 (2.7) P-value= 0.027	N=11	-0.5 (2.25) P-value= 0.332	P= 0.296

***92% mindful participants experienced a decrease in stress due to alterations in parental role on PSS:NICU (only 64% control). Scores decreased in 12 of 13 mindful parent participants.**

Primary Aims Evaluations: Bonding

mean (SD)	Mindful/Experimental Group (N=28)		Control Group (N=27)		p-value
	Valid N	Mean (SD)	Valid N	Mean (SD)	
MIBS	N=16	1.81 (2.46)	N=19	1.68 (2.87)	<i>P=0.462</i>
Range: 0-24		MIBS Range: 0-9 (0 in 37.5%)		MIBS Range: 0-11 (0 in 52.6%)	

- Mindful parents had a statistically significant notation of depression/anxiety history ($P=0.009$).
- Prior research reports parents w/ history of depression have more difficulty bonding with their infants.
- However, results show no significant difference in bonding scores between groups in this study, thus the intervention may have improved parent-infant bonding scores.

Secondary Aim Evaluations: Satisfaction

- Parent Satisfaction
 - Parents in mindfulness group expressed great appreciation for the training received.
 - 100% of parents reported to be satisfied or extremely satisfied with their care; no statistically significant differences between groups ($p= 0.287$)
 - Universally high satisfaction scores are common problem in research
 - Future studies should consider using a more acutely specific tool to compare satisfaction between groups



RESULTS- Satisfaction Quotes

• Experimental/Mindful:

- “I was only here for about 4 weeks and have met so many nurses and as hard as it was for me as a mom to not have my baby home, it was a great learning experience. I learned a little from each nurse and have used it with my baby. I got to take classes and ask unlimited amounts of questions. I learned how to deal with stress a lot better as well, to any 1st time mom or mom new to the NICU its a scary, stressful experience. But learning why everything is the way it is (the machines, lights, meds, etc.) it makes it easier.”
- “Thank you for all the nursing staff for taking the time to nurture and care for my baby during his time in the NICU. His stay in the hospital has been a pleasant experience. I honestly believe the diligent care made it possible for him to come home sooner than expected.”

• Control:

- “There are not enough words to express our thanks and appreciation for all of the care our baby received...”
- “I had the best nurses everyday of our stay. They were informative, helpful, and sympathetic. For going through something that is so scary and unknown I felt at ease knowing the care he was receiving. Thank you, thank you a million times...”
- “Words can't describe how thankful we are, everybody was skillful and compassionate. ... Each person who worked with us was so kind, skillful and compassionate in their caring, the nurses (I call them angels), doctors, receptionist, even the cleaning people. Thank you, our lives change in a good way, we learned a lot. ... I can never thank you enough for taking care of a piece of my heart.”

RESULTS- Length of Stay

Secondary Aim Evaluations: Length of Hospitalization

- Corrected Gestational Age
- Length of Stay in days

mean (SD)	Overall, N=60 (with outlier removed)	Experimental/ Mindful Group N=31 (with outlier removed)	Control Group N= 29	p-value (with outlier removed)
Discharge Corrected Gestational Age (CGA) in weeks	37 4/7 wk (2.5) 37 3/7 wk (2.3)	36 6/7 wk (2.5) 36 4/7 wk(1.7)	38 wk (2.5)	P= 0.132 P= 0.022
LOS in days	58 d (35) 57 d (35)	49 d (31) 47 d (29)	68 d (38)	P= 0.047 P= 0.026

Experimental group infants were able to be discharged at an earlier gestational age (8 days earlier, 10 days) and had a shorter average length of stay (19 days less, 21 days).

RESULTS- Length of Stay

Secondary Aim Evaluations: Length of Hospitalization

mean (SD)	Overall, N=60 (with outlier removed)	Experimental/ Mindful Group N=31 (w/ outlier removed)	Control Group N= 29	p-value (with outlier removed)
Discharge Corrected Gestational Age (CGA) in weeks	37 4/7 wk (2.5)	36 6/7 wk (2.5)**	38 wk (2.5)	P= 0.132
	37 3/7 wk (2.3)	36 4/7 wk(1.7) **		P= 0.022
LOS in days	57.6 d (34.9)	48.7 d (30.1)**	67.2 d (37.7)	P= 0.047
	56.7 d (34.6)	46.6 d (28.4)**		P= 0.026

- Average total cost NICU care/day: \$3,500; shorter stay = lower costs.
- **Mindful group infants were discharged **8-10 (CGA) or 19-21 (LOS) days** earlier than control infants, which equates to **potential cost savings of \$28,000-\$73,500 per patient.**
- Earlier discharge home has additional value due to positive emotional and familial outcomes that cannot be estimated in financial terms.

CONCLUSIONS

Primary Aims:

- **Stress:** not significant b/t groups.
 - However, changes in stress over time revealed that mindful parents had a significant reduction in stress (overall $p=0.012$ & parental role specific stress $p=0.027$) within the cohort, while control parents did not.
- **Bonding:** not significant b/t groups.
 - Experimental group had a significant # of parents with hx of depression ($p=0.009$). Prior research shows poor bonding with depression history, thus poor bonding scores would be expected in our experimental group.
 - No significant difference was noted, thus the study intervention may have had a positive impact on the parent-infant bonding.

Secondary Aims:

- **Satisfaction:** not significant between groups.
 - All parents were satisfied or extremely satisfied
- **LOS:** statistically significant, $p= 0.022-0.047$
 - Mindful infants had shorter stays (8-21 days), care costs ~\$3,500/day
 - Potential savings of \$28,000-\$73,500 per infant
 - Earlier discharge home has positive family impact which are priceless.

RECOMMENDATIONS

Though “statistically significant” differences were not achieved in all outcome measures, study results indicate improvements in:

- parent stress and infant length of stay which has potential positive financial & family impact.

Recommendations:

- Additional research
 - larger sample size
 - varied research sites
- Training for NICU staff in mindfulness-based neurodevelopmental care/parent education.



QUESTIONS???



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