An Educational Program to Address Maternal Health Disparities and High Infant Mortality in Pitt County, NC

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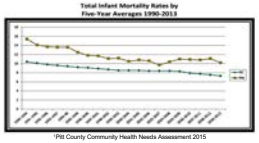
BACKGROUND

- Infant mortality (the death of an infant before his or her first birthday) remains above state and national averages in Pitt County.[1]



[1]Pitt County Community Health Needs Assessment 2015

- Low infant birth weight, premature birth, and other maternal/infant health factors, such as smoking and decreased rates of breastfeeding, contribute to the high infant mortality rate in Pitt County.[1,2]
  - The percentage of Pitt County pregnant women who smoke continued to rise from 9.6% to 10.6% from the period of 2005-2009 to 2011-2013.[1]
  - 46.8% of Pitt County mothers who enrolled in WIC initiated breastfeeding from 2011-2013, compared to 57.2% statewide during the same period.[2]
- Maternal health disparities remain between African American, Caucasian, and Hispanic mothers.[1]

PROJECT AIM

- Hypothesis: Prenatal support and education affects mothers and partners by decreasing anxiety, increasing confidence and competence, and contributing to beneficial lifestyle changes.
- Objective: Determine the effectiveness of a free longitudinal education program provided to Pitt County mothers, in reducing maternal health disparities and high infant mortality.
- Project Aims:
  - Assess maternal anxiety and lifestyle changes both pre- and post-class and longitudinally.
  - Analyze participant confidence with breastfeeding pre- and post-class.
  - Evaluate participant competence and confidence with infant CPR and rescue pre- and post-class.

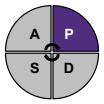
PROJECT DESIGN/STRATEGY

- Program is intended for pregnant women and support persons in Pitt County, with brochures distributed throughout the community.
- Maternal anxiety and lifestyle changes were analyzed among these participants using the validated questionnaires[3,4] to compare anxiety and lifestyle changes pre- and post-class, and longitudinally.
  - The State Trait Anxiety Inventory (STAI-6) assesses caregiver anxiety. Participants answer questions on a 4-point scale from "not at all" to "very much so." Survey internal consistency coefficient: 0.86-0.95. STAI-6 was administered pre- and post-class.
  - The Lifestyle Indicator Questionnaire (LIQ) assesses individual lifestyle activities that are associated with disease. The abbreviated LIQ focuses on exercise, smoking, alcohol consumption, and lifestyle changes. The abbreviated LIQ was administered pre-class.
- Breastfeeding confidence was assessed pre- and post-class via survey.
- Infant CPR competence and confidence were analyzed pre- and post-class via survey, written exam, and parent skill demonstration.
- Paired *t* test and Wilcoxon signed-rank test were used to assess for statistical significance.
- Lifestyle changes as part of LIQ were evaluated qualitatively.

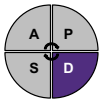
Table 1. Participant Information June – December 2017

Total Class Attendance		174
Surveys Completed		128
	1 Class	83
	2 Classes	28
	3+ Classes	17

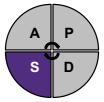
CHANGES MADE (PDSA CYCLES)



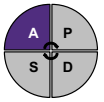
Plan
- Provision of prenatal (and postpartum) support and education in Pitt County, NC from June to December 2017 to reduce maternal health disparities and high infant mortality.
- Aim to decrease anxiety, increase confidence and competence, and contribute to beneficial lifestyle changes.



Do
- Assess maternal anxiety and lifestyle changes both pre- and post-class and longitudinally.
- Analyze participant confidence with breastfeeding pre- and post-class.
- Evaluate participant competence and confidence with infant CPR and rescue pre- and post-class.
- Consider longitudinal lifestyle changes.

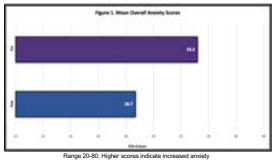


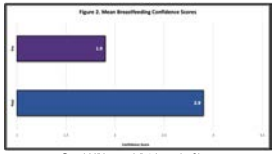
Study
- Mean anxiety decreased significantly from pre- to post-class.
- Maternal breastfeeding confidence increased significantly.
- Participant confidence and competence with infant CPR/choking rescue material increased significantly.
- Multiple mothers indicated specific beneficial lifestyle changes throughout the course series.
- Data suggests that prenatal support and education can decrease anxiety, increase confidence and competence, and contribute to beneficial lifestyle changes, which can greatly assist in decreasing infant mortality.

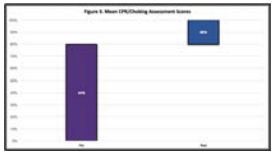


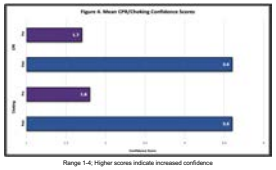
Act
- Implement a program component, infant CPR, as part of Vidant Medical Center perinatal education.
- Beginning January 15, 2018, a new medical student-run free community infant CPR program will be offered bi-monthly in English and Spanish.
- Pre- and post-course surveys will determine participant anxiety, self-efficacy, confidence, and competence via research-validated tools.
- Prior to this initiative, infant CPR has never been offered as a free program to all new mothers/infant caregivers at Vidant Medical Center.

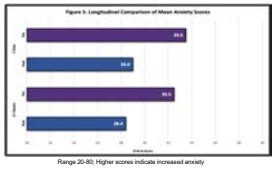
INITIAL RESULTS & KEY FINDINGS

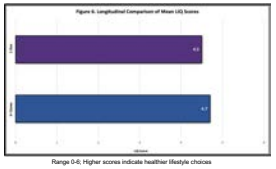












- Mean anxiety decreased significantly from pre- to post-class.
  - Data indicated a mean pre-class score of 33.2 and a mean post-class score of 28.7 (range 20-80; $P<0.001$).
- Confidence with breastfeeding increased significantly in maternal participants.
  - Data showed increased mean confidence scores from 1.9 to 2.9 (range 1-4; $P<0.001$).
- Confidence with infant CPR and choking rescue increased significantly in participants.
  - Data demonstrated increased mean confidence scores for infant CPR from 1.7 to 3.6, and infant choking rescue from 1.8 to 3.6 (range 1-4; $P<0.001$).
  - Corresponding competence with infant CPR and choking rescue skills increased significantly from mean pre-exam score of 44% to mean post-exam score of 99% ($P<0.001$).
- Total of 29 surveys indicated specific lifestyle changes throughout the course series, including increasing water, fruit, vegetable, and whole grain intake; and decreasing or eliminating alcohol, soda, caffeine, sugar, carbohydrate, fried or fast food, and high-mercury seafood and sushi intake.
- Unexpected Results:
  - Anxiety decreased to a lesser extent for mothers who attended multiple classes in the series compared with mothers who only attended one class (decrease of 4.1 for mothers who attended multiple classes vs. decrease of 4.6 for mothers who attended one class).
  - Lifestyle indicator scores increased only slightly for mothers who attended multiple classes.
    - The only LIQ variable that changed was decreased exercise with increased gestational age.

LIMITATIONS

- No control group
- Self-reported survey data
  - Potential for fatigue, misunderstanding, or disinterest in mothers completing pre- and post-class surveys
- No long-term participant follow-up for continued assessment
- Initial results only include 128 surveys
  - Only 35.2% of mothers attended multiple classes
- LIQ Scoring does not take into account normal decreased maternal exercise with increasing gestation
  - Quantitative LIQ scores do not consider healthy lifestyle changes reported by maternal participants

LESSONS LEARNED

- Data suggests that prenatal support and education can affect mothers and partners by decreasing anxiety, increasing confidence, and contributing to beneficial lifestyle changes, which can greatly assist in decreasing infant mortality.
- Longitudinal LIQ scores increased only slightly for mothers who attended multiple classes:
  - This is likely due to reduced maternal exercise with advancing gestation, as all decreasing LIQ scores were due to a decrease in maternal exercise.
  - Total of 29 surveys indicated positive lifestyle changes which are not accounted for in quantitative LIQ scoring results, including:
    - Increased water, fruit, vegetable, and whole grain intake
    - Decreased or eliminated alcohol, soda, caffeine, sugar, carbohydrate, fast food, and high-mercury seafood intake
- Longitudinal anxiety scores decreased for mothers who attended multiple classes in the series, but to a lesser extent than the decrease seen with mothers that attended only one class.
  - Pre-class anxiety scores were 1 point lower for mothers who attended multiple classes; therefore, the same decrease may not be expected for this group.
- Additional benefits of maternal participation appear to be interaction, bonding, and friendships between mothers in the program.

NEXT STEPS

- Continue medical student-run infant CPR class series as part of Vidant Medical Center perinatal educational program.
- Evaluate participant ability to complete infant CPR and choking rescue scenario.
- Evaluate participant pre- and post-class self-efficacy.
- Continue to evaluate STAI-6 scores pre- and post-class.
- Consider comparing STAI-6 scores between mothers who attended large classes (11-20 participants) and mothers who attended small classes (1-10 participants)
- Measure/evaluate longitudinal CPR exams for select participants.

ACKNOWLEDGMENTS

- This pilot project was funded by the Albert Schweitzer Foundation.
- Project site mentors, Jamie Hobgood, RN and Sharon Mangan, MD, assisted with distribution of course fliers to appropriate maternal patients.
- Dr. Mark Stacy and the ECU Medical & Health Sciences Foundation supported funding for Vidant Medical Center infant CPR class supplies.

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