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A Pulse for Progress – Examining the Efficacy of Best Nursing Developmental Care Practices for Children with Congenital Heart Disease at Risk for Developmental Delay in the PCICU: A Prospective Quasi-Experimental Cohort Study

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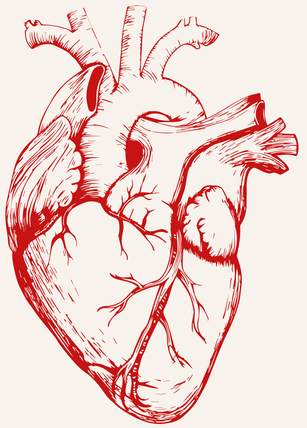

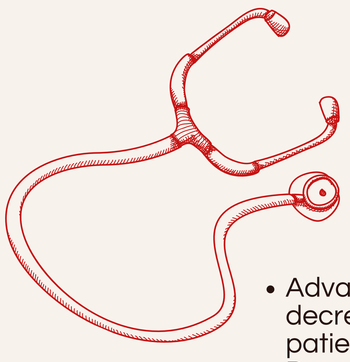

Introduction

- Advances in pediatric cardiovascular surgery decreased mortality rates among pediatric patients with congenital heart disease (CHD).
- Developmental delays (DDs) are increasingly pervasive among this population with more than 50% with critical CHD presenting with DDs (Smith, 2023).
- DDs lead to lower educational achievement and quality of life (QoL) (Lisanti et al., 2022)
- Recent research suggests that prolonged exposure to the pediatric cardiac intensive care unit (PCICU), with its environmental stressors, negatively implicates neurodevelopment (Lisanti et al., 2023).
- The Cardiac Inpatient Neurodevelopmental Care Optimization (CINCO) program is a developmental care bundle intended to minimize risk of DDs, yet has minimal clinical acceptability at this time (Wolfe et al., 2023).
- There is limited evidence that this bundle improves Denver Developmental Screening Test-2 (DDST-2) scores among this population.

Hypothesis

The implementation of CINCO, a comprehensive developmental care bundle, reduces risk of DDs among children with CHD in the PCICU.

Method

- Research design
  - Prospective Quasi-Experimental Cohort. with group 1 as the control group and group 2 as the intervention group where CINCO is implemented.
- Participants
  - Sample size: Power analysis yielded n=116 neonate to six year olds at risk for DD, 58 per group.
  - Inclusion criteria: acyanotic & cyanotic CHD patients 0-6 yr old admitted to a Northern CA PCICU with LOS > 1 week, at risk for DD, history of CPR, cardiac surgery, or mechanical ventilation
- Materials & Measures
  - DDST-2, a developmental screening test, is a commonly utilized tool to assess for developmental delays.
- Procedure
  - PCICU nurses utilize DDST-2 to assess each participant's risk of DDs upon admission, at 2 weeks, at 1 month, and 2 weeks post-discharge.

Results

- Chi square tests quantify the significance ($P < 0.05\%$) of the relationship between CINCO and reduction of DDs based on DDST-2 results.
- Paired sample t-tests evaluate mean differences in control group and intervention group in reduction of DDs.
- Findings will indicate if the implementation of CINCO mitigates the risk of DDs among children with CHD. The null hypothesis will be rejected.

Conclusion

- This proposed study will evaluate the efficacy of the CINCO program as a developmental care bundle for PCICUs in curtailing risk of DDs among children with CHD.
- Given this pediatric population increasingly survives into adolescence and adulthood, it is more pertinent than ever to curb these DDs.
- Each PCICU intervention that can allay or obviate a DD has the possibility to enhance these children's academic outcomes and QoL.
- Further research is needed to examine the implications of CINCO interventions country-wide in reducing risk of DDs, as well as staff acceptability of this comprehensive developmental care bundle in PCICUs across the United States of America.

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This research proposal will be approved by the Dominican University of California review board and Institutional Review Board.