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Enhancing The Special Care Nursery's Environment Through Noise Reduction: A Quality Improvement Initiative

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Background

The Special Care Nursery (SCN), a level 2 neonatal nursery, admits an average of 1000 babies annually and faces a challenge with high noise levels. This poses risk to the well-being and developmental outcomes of vulnerable infants. Prolonged exposure can also lead to hearing impairment in infants. Additionally, constant high noise levels necessitate louder speaking, causing fatigue and irritation among caregivers and staff. This results in reduced work performance, and increased errors. Multitude of activities occurring throughout the day in the SCN with no designated rest time contributes significantly to these elevated noise levels, surpassing the recommended limit of 45 decibels (dB) by the American Academy of Pediatrics.

Aim

The project aimed to reduce the median noise-level in SCN by 20%.

Methodology

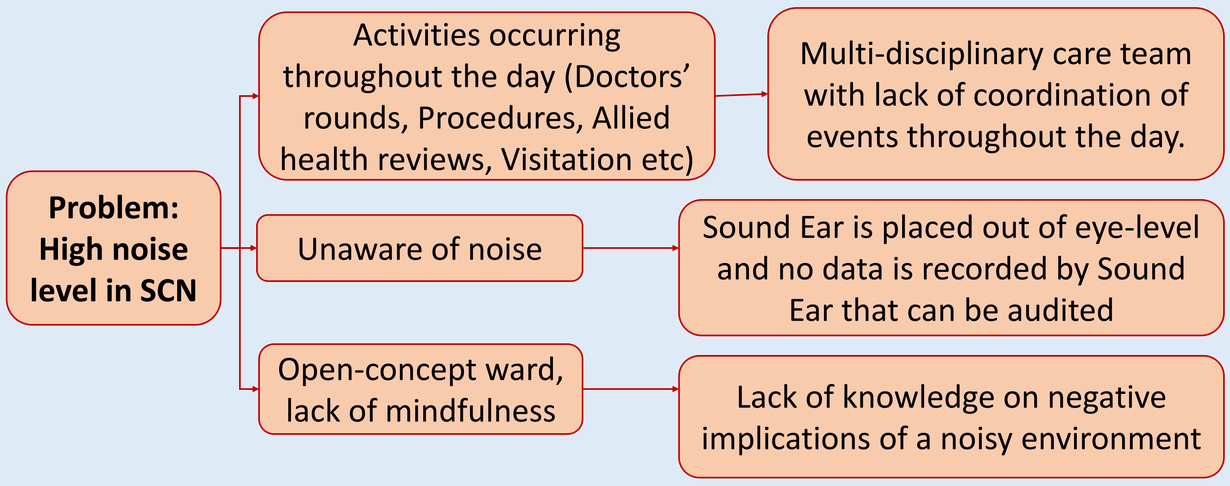
A pilot project was conducted from February to April 2024 in SCN Pink, one of the 2-arms of the ward.

A 3-step Quality improvement (QI) model was used:

Step 1: Problems and opportunities

- Process map of a typical day in the ward was done
- Noise levels at 5-time intervals were collected using the NIOSH Sound Level Meter application on an iPad
- Customized surveys were distributed to parents and staff to capture their perspectivesabout noise level in the SCN.

Step 2: Root cause analysis



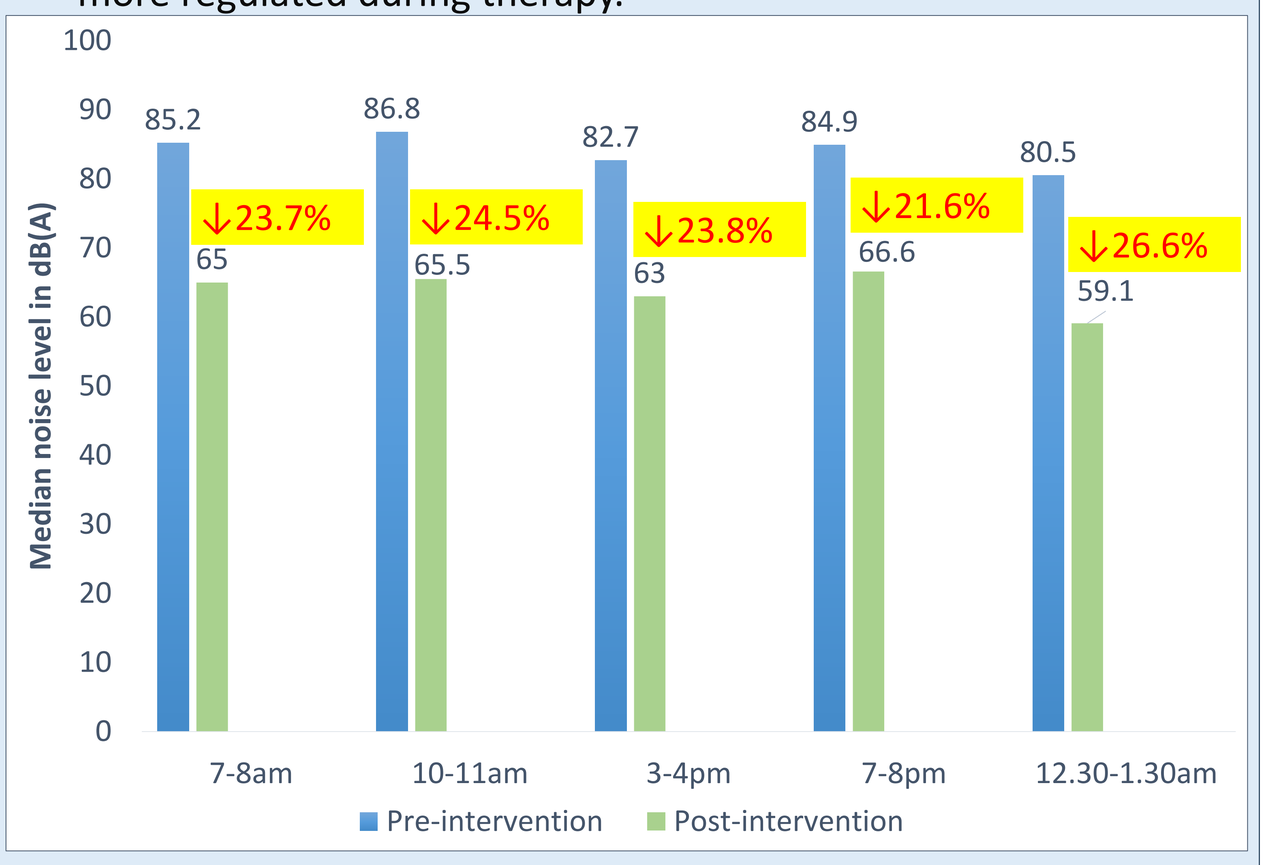
Step 3: Solutions

Root Cause	Solutions
Multi-disciplinary care team with lack of coordination of events throughout the day	**Introduce Quiet Time** @ 1030-1130am, 3-4pm, 12-1am • Avoided non-urgent activities/ procedures • Door closed, Lights dimmed, blinds lowered • Soft instrumental music was played through synchronised Bluetooth speakers in the ward
SoundEar© is placed out of eye-level and no data is recorded for audit	• Staff education on the impact of noisy environment, function of the sound ear • Staff training on implementing Quiet Time • Displayed posters within SCN to serve as a visual reminder for staff and caregivers
Lack of knowledge	

Post-implementation, noise levels were measured at the same 5-time intervals and a customized survey was administered to parents and staff to gather feedback on the impact of the interventions.

Results

1. Median noise level decreased by 22-27% post intervention.
2. More than 80% of staff reported improved awareness, mindfulness and perception of noise levels.
3. 87% of staff reported improvements in babies' sleep patterns and calmness.
4. While 79-81% of staff reported enhanced staff communication and work performance in their care for patients, 88% of staff felt improved general mood.
5. 90% of parents expressed satisfaction with Quiet Time, noting increased opportunities for bonding, optimal environment for kangaroo care, and improved infant calmness and sleep quality.
6. 80% of parents also reported being more mindful about the noise levels beyond designated Quiet Time periods.
7. Allied health professionals reported that babies were calmer and more regulated during therapy.



Conclusion and future directions

The QI project's Quiet Time initiative was successful in achieving its goal and was well received by both staff and parents. This emphasizes the effectiveness and viability of the interventions in creating a quieter and more conducive environment within the SCN. Due to logistical constraints, direct impact on infants were not measured.

Future directions include troubleshooting technological challenges and continuing to address other identified factors that contribute to excessive noise. The team aims to ensure its long-term effectiveness in maintaining reduced noise levels within the SCN and expansion of Quiet Time across the entire ward.

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References

Almadhoob, A., & Ohlsson, A. (2020). Sound reduction management in the neonatal intensive care unit for preterm or very low birth weight infants. *Cochrane Database of Systematic Reviews*, (1).

Edwards, A., & Austin, T. (2016). Noise in the NICU: how prevalent is it and is it a problem. *Infant*, *12*(5), 161-165.

Mayhew, K. J., Lawrence, S. L., Squires, J. E., Harrison, D., Dowling, D., Newberry, D. M., & Parker, L. (2022). Elevated Sound Levels in the Neonatal Intensive Care Unit: What Is Causing the Problem?. *Advances in Neonatal Care*, *22*(6), E207-E216.