

Optimizing Neonatal Care: Enhancing CPAP Therapy

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BACKGROUND

Continuous Positive Airway Pressure (CPAP) is a form of respiratory support used for newborns with underdeveloped lungs or respiratory distress. It provides a steady flow of pressurized air to keep the infant's airways open, preventing lung collapse and enhancing oxygen exchange. CPAP is crucial for helping neonates stabilize their breathing, maintain proper oxygen levels, and support lung development during the critical early stages of life. The selection of respiratory support devices can profoundly influence the neonates' well-being and can have repercussions on parents' ability to participate actively in caregiving.

In 2022, a group of 26 newborns was discharged from the Neonatal Intensive Care Unit (NICU), with 24 of them requiring home CPAP upon discharge. Caregivers reported challenges in using the nasal prongs (Figure 1) at home, with 30% of patients switching to a nasal mask (Figure 2) after discharge. Feedback from caregivers highlighted issues such as frequent dislodgement of prongs and causing nasal irritation. The Home Care Team's assessment indicated that these problems were related to proper positioning, fitting, and maintenance of the nasal prongs. Switching from nasal prongs to masks increased the workload for the Home Care Team, as they needed to determine the appropriate mask sizes, suitability of mask and procuring them through vendor.

AIM

To ensure that 80% of NICU patients requiring CPAP are discharged with nasal masks from January 2023 to August 2023. This goal aims to optimize respiratory support for neonates, as evidence indicates that infants using nasal masks instead of nasal prongs experience fewer instances of nasal CPAP failure and nasal injuries (King et al., 2019).



Figure 1: Nasal Prongs



Figure 2: Nasal Mask

METHODOLOGY

All neonates discharged from the NICU requiring non-invasive home (CPAP) between 2022-2023 will be included in this study. The team reviewed parents' complaints, feedback (Root Cause Analysis) regarding the use of nasal prongs and noted the incidents of prongs dislodgement (60%), interface associated complications (53%), ie. nasal irritation, skin redness etc and device improper fit (60%).

The team brainstormed and decided to have all neonates discharge with nasal masks by default, with exception for patients with contraindicating condition who requires other alternative method of non-invasive ventilation. Our team has also developed an informative visual poster (Figures 3 & 4) to educate both nurses and caregivers on the correct usage of nasal masks. This poster is accessible through the hospital's website for easy access.

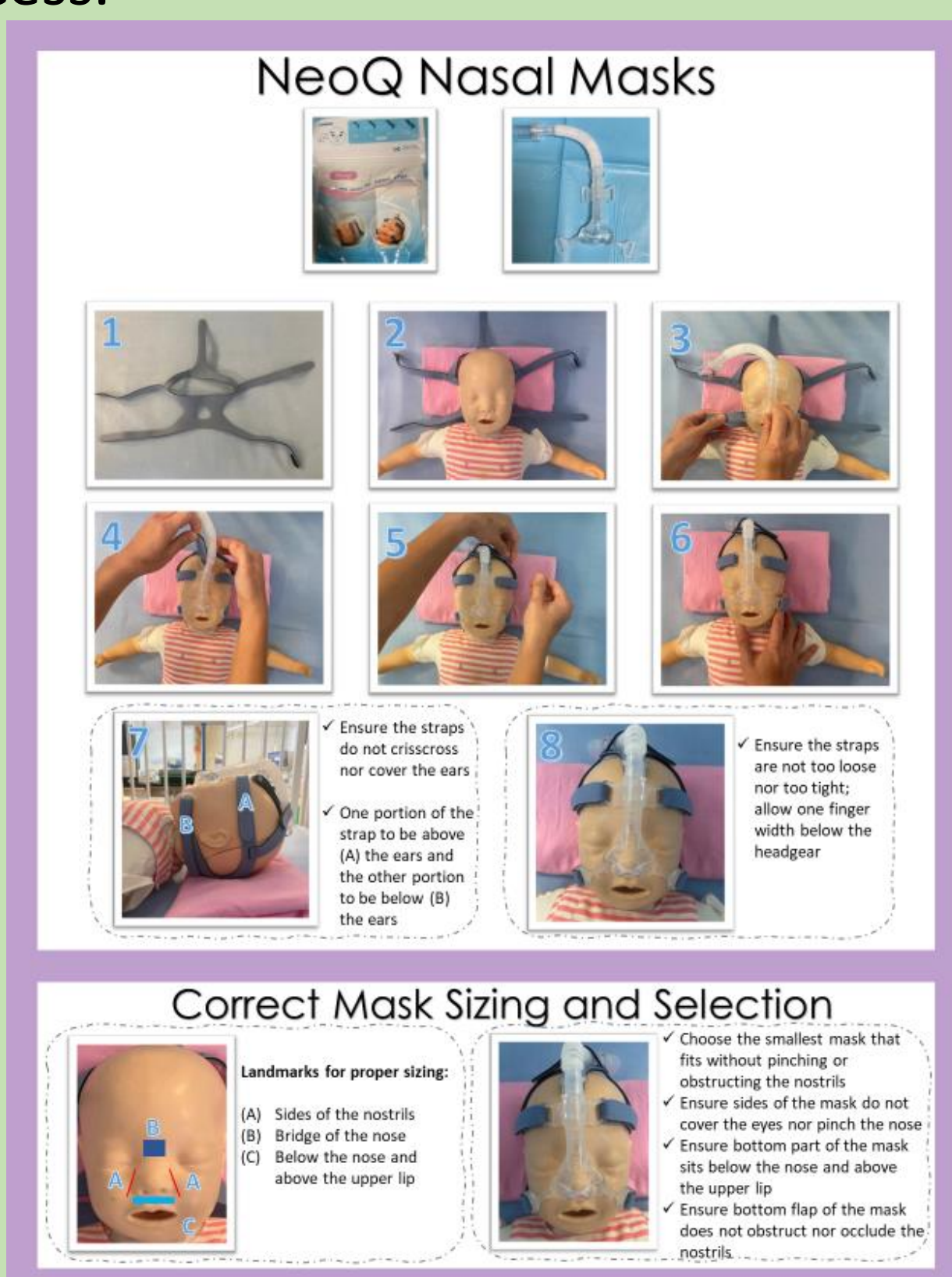


Figure 3: Visual Poster



Figure 4: Visual Poster

INTERVENTIONS

Post intervention feedback was collected from parents of neonates discharged with nasal masks, at least one week after discharged. These parents received a set of standardized questions via text, addressing aspects such as the mask's fit, any complications from its use (e.g., dislodgement or nasal irritation), and the overall quality of the mask.

RESULTS

Post-intervention data from January 2023 to August 2023 showed that 94% of patients were discharged with nasal masks (Chart 1). A minority of patients were discharged with nasal prongs due to contraindications.

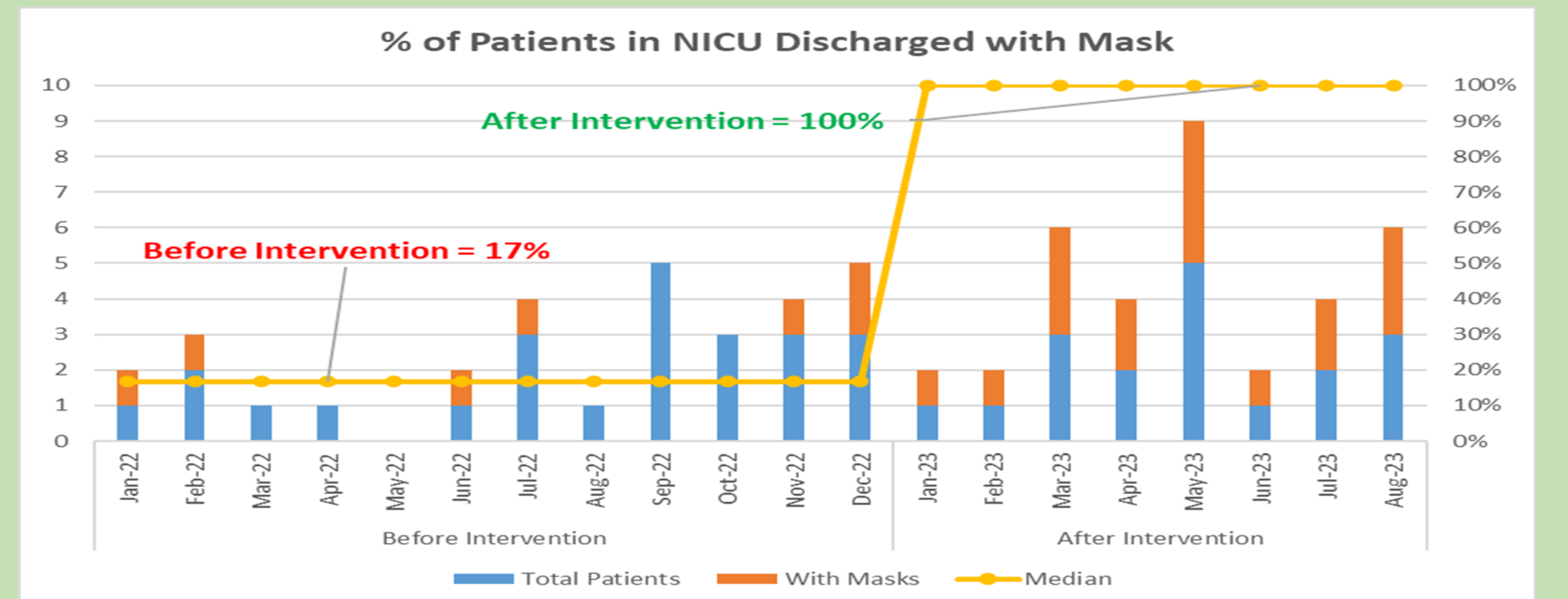


Chart 1: Improvement in patients discharging with mask

The main concern raised by parents was the quality of the masks, specifically the velcro strap properties of the headgear. While 20% of parents felt that the fit was less suitable for their neonates compared to nasal prongs, a significant majority (60%) found that the nasal masks provided an excellent fit for their babies (Chart 2).

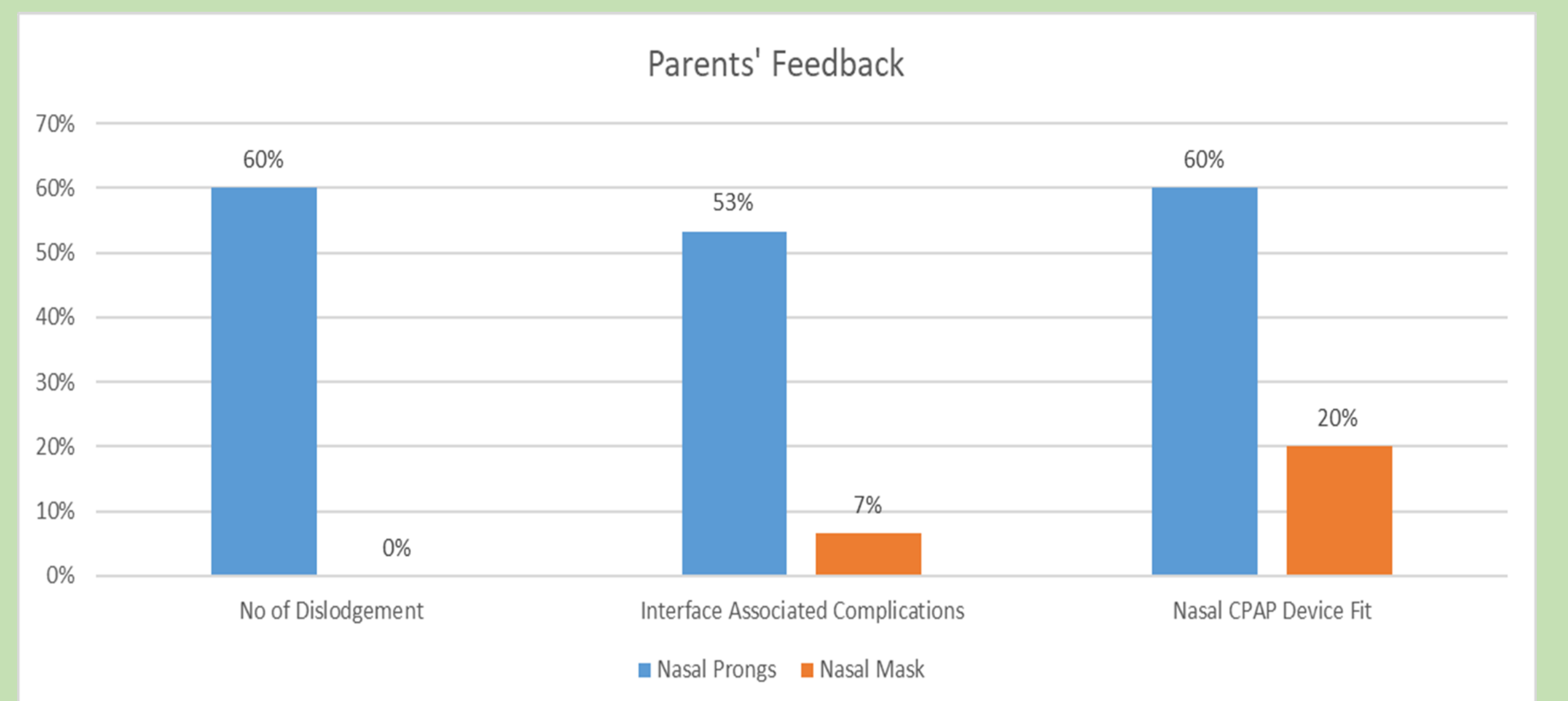


Chart 2: Parents' Feedback

In contrast, when neonates used nasal prongs, parents frequently reported dislodgement issues (60%). However, no dislodgement was reported with the use of nasal masks. Additionally, interface-related complications, such as nasal irritation and skin redness, significantly decreased during this period as depicted in Chart 3.

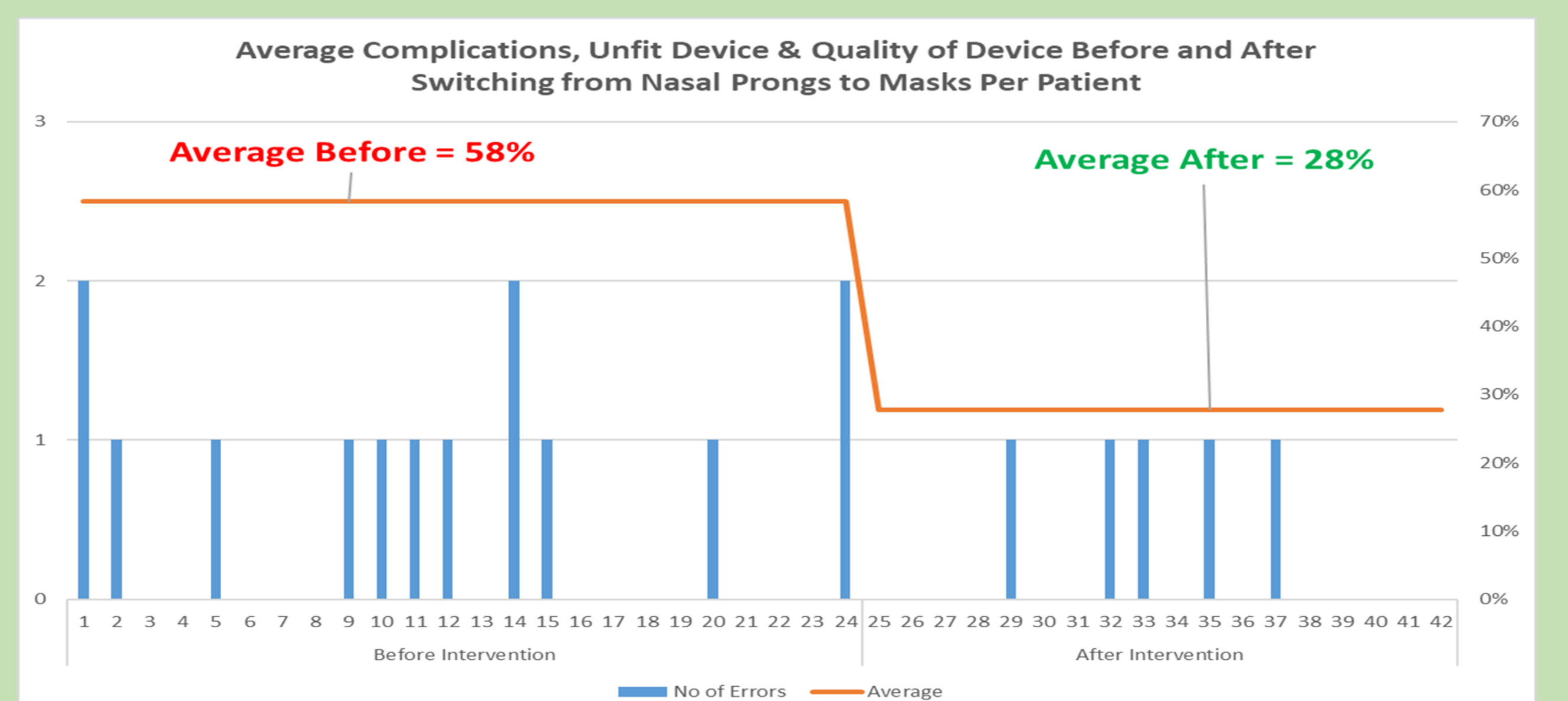


Chart 3: Interface-Related complications

CONCLUSION

These findings add to the growing evidence supporting nasal masks as a standard respiratory support device in the NICU, benefiting both infants and their families. By addressing the challenges parents face when using nasal prongs, the quality of care can be enhanced, fostering a more supportive environment for parent-infant bonding.