



EFFECT OF CROCHET OCTOPUS IN THE PAIN LEVEL AND PHYSIOLOGICAL PARAMETERS DURING HEEL LANCE PROCEDURES AMONG NEONATES

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ABSTRACT This study evaluates the impact of using a crochet octopus as a non-pharmacological intervention to manage pain and stabilize physiological parameters in neonates during heel lance procedures. A randomized approach with 50 neonates was used to compare pain levels and physiological responses with and without crochet octopus therapy. Data from neonatal infant pain scales, heart rate, respiratory rate, and oxygen saturation were analysed. The results showed a statistically significant improvement in respiratory rates and transient improvement in oxygen saturation shortly after the procedure, with a modest decrease in average pain scores, revealing that the crochet octopus therapy is a promising adjunct for neonatal comfort and stress reduction during invasive procedures.

KEYWORDS :

INTRODUCTION

Neonatal pain is a real and measurable phenomenon that can have short- and long- term physiological and behavioural consequences. The heel lance procedure, commonly performed for diagnostic purposes, is a source of acute pain and stress for newborns. Pharmacological approaches have limitations and risks in neonates, emphasizing the need for nonpharmacological interventions. The crochet octopus, whose tentacles simulate the intrauterine experience of grasping the umbilical cord, may facilitate self-calming and physiological stability. This study investigates its clinical effectiveness in an Indian hospital setting.

Objectives

Assess pain level and physiological parameters of neonates without crochet octopus during heel lance. Assess pain level and physiological parameters of neonates with crochet octopus during heel lance. Associate pain responses and physiological outcomes with neonatal demographic variables. Methods Design and Setting randomized experimental study was conducted in a tertiary care hospital in Mumbai between February and March 2025. Fifty neonates eligible by age (within 28 days), not sedated or on pharmacologic analgesics, undergoing heel lance for common sampling indications were selected using a simple random sampling technique.

Intervention

The intervention group received a sterilized crochet octopus toy ten minutes prior to and during the heel lance. Pain was evaluated using the Neonatal Infant Pain Scale (NIPS), and physiological parameters (heart rate, respiratory rate, oxygen saturation) were recorded at four time points: before, during, 2 minutes after, and 10 minutes after the procedure.

Ethical Considerations

Institutional ethical committee approval and parental informed consent were obtained to ensure participant rights and confidentiality.

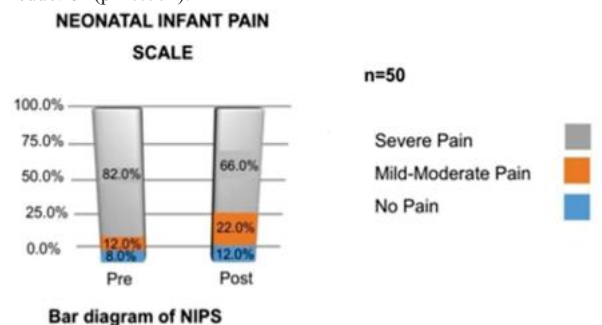
RESULTS

Sample Characteristics

- 64% of neonates were aged 1-7 days
- 86% had birth weight between 2.5-3.5 kg
- 88% were beyond 37 weeks post-gestational age
- 62% of neonates were male

Pain Scale Analysis: There was a decrease in the average NIPS pain

score from 5.98 (pre-intervention) to 5.10 (post-intervention), with the Wilcoxon Signed Ranks Test showing a statistically significant reduction ($p=0.001$).



Neonatal Infant Pain Scale

	Pre	Post
NEONATAL INFANT PAIN SCALE	5.98	5.10

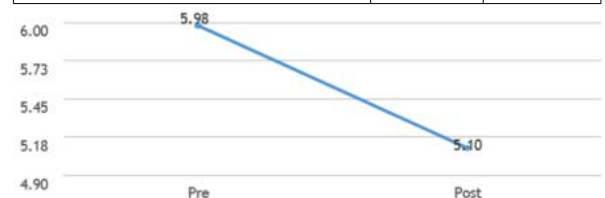


Diagram Represents a Pain Score (NIPS- Neonatal Infant Pain Scale) Before and After an Intervention

Physiological Parameters Heart Rate: No statistically significant difference at any time point; slight improvement trends observed, especially within 2 minutes after intervention.

Respiratory Rate: Statistically significant improvements before ($p=0.033$), during ($p=0.003$), and 10 minutes after the procedure ($p=0.003$), indicating better maintenance of normal respiratory rates postintervention.

Oxygen Saturation: Transient, statistically significant improvement at 2 minutes post procedure ($p=0.000$). However, pre procedure and

10-minute post-procedure saturation levels were not significantly changed.

Behavioural Observations: Reduction in grimace and increase in relaxed facial expressions post intervention. Mild improvements in relaxed breathing and arm muscle tone. The presence of vigorous cry postintervention may reflect increased neurological responsiveness, not necessarily pain alone.

Subgroup Findings: Female neonates displayed a higher heart rate within 10 of baseline compared to males. Pre-term and low birth weight neonates demonstrated significant differences in cry categories and heart rate responses post-intervention.

DISCUSSION

While pain in neonates remains a clinical challenge, non-pharmacological methods like crochet octopus therapy provide a gentle, cost-effective means of comfort. The study demonstrates modest but statistically meaningful improvements in pain and certain physiological parameters, predominantly respiratory rates. The intervention showed no statistically significant impact on heart rate and only a short-lived improvement in oxygen saturation. Limitations include a small sample size, single- procedure focus (heel lance only), and subjective behavioural assessments.

Implications and Recommendations

Routine inclusion of pain assessment tools (NIPS) in neonatal protocols. Nonpharmacological comfort measures, including crochet octopus therapy, should be encouraged and standardized. Staff training and nursing education modules should integrate neonatal pain management practices. Further studies are recommended, including larger sample sizes, diverse settings, and comparative analysis with other interventions.

CONCLUSION

The crochet octopus intervention provided measurable pain relief and aided in normalizing physiological responses, especially respiratory rate, in neonates during heel lance procedures. These findings support its adoption as a simple, safe adjunct in peri-procedural neonatal care. Results highlight the need for ongoing research and practice improvements in neonatal pain management.

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