Utilization of Mechanically Simulated Kangaroo Care as a Novel Homeostatic Method to Promote Healthy Development in Mus musculus as a Model for Human Preterm Neonates

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Globally, prematurity is the leading cause of death for newborns; approximately one million children die each year due to complications of preterm birth. This project develops a novel method to promote healthier development in neonates by utilizing mechanically simulated kangaroo care for Mus musculus neonates as a model for humans. A majority of premature babies are treated with traditional maternal kangaroo care; however, this method isn't always possible as it requires the attention of a mother for at least one consecutive hour. The potential for mechanically simulated kangaroo care opens the doors for a treatment technique that does not require the mother and can be implemented for extended periods of time. In this research, three groups of five mice were randomly assigned to a treatment group of 0, 1, or 2 hours of mechanically simulated kangaroo care. The mice were tested for levels of mobility, heart rate, temperature, body weight, and scored based on the body condition scoring technique. After 21 days, the mice groups followed a positive relationship where increased hours exposed to kangaroo care led to increased mobility, less variable heart rates, healthier body weights and body scores, and stabilized temperature. Based on these results, this project suggests that mechanically simulated kangaroo care was able to promote healthier development in Mus musculus neonates and provided insight into the positive impact of mechanically simulated kangaroo care on human preterm neonates. It is inferred that these positive impacts were observed as a result of the calming effect of kangaroo care that decreases the sympathetic and parasympathetic nervous system components of heart rate variability and stabilizes long-term heart rates, summarized as increased homeostasis.

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