Happy Hips
Venkata Kodali

Developmental dysplasia of the hip (DDH) is a detrimental and prevalent issue in infants. Approximately 1 in 1000 infants have major DDH caused by incorrect swaddling. This can occur when a swaddle is excessively tight or loose. Correct swaddling techniques are not widely known and are often tied too tightly, leading to higher rates of DDH. Utilizing current DDH data and modern technologies including ultrasonic sensors, the Happy Hips swaddle can monitor the baby's hip position and ensure the optimal swaddling technique is kept, alerting when not. A measurement based on infant DDH data and international guidelines was added after feedback from healthcare professionals. The unique design of the Happy Hips swaddle makes it the only swaddle that can be used by patients that are being treated for DDH through treatment methods such as the pavlik harness and spica casts. Testing, with ethical precautions and input from specialists, led to safety improvements with biodegradable hooks made from PLA plastic to prevent infant rolling as this could cause death. Simultaneously, the biodegradable hooks allow for the swaddle to be attached to Indigenous cradle boards, making it culturally inclusive, another major goal of this project. After approval from orthopaedic surgeon Dr. Kishore Mulpuri, the swaddle was tested with 9 parents, with the third prototype being rated the most successful. Furthermore, ultrasonic sensors and light-emitting diodes were integrated to provide instant feedback on the tightness of the swaddle. After survey results were examined, 89% (8 of 9) were unaware of DDH before testing and 100% felt the swaddle was easy to use and comfortable for their infants. Survey results also showed that all caregivers wanted to purchase the swaddle for their infants. The Happy Hips swaddle has the potential to improve infant development worldwide. Even if it helps just one infant, it has fulfilled its purpose by promoting safer swaddling practices and raising awareness about DDH.

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