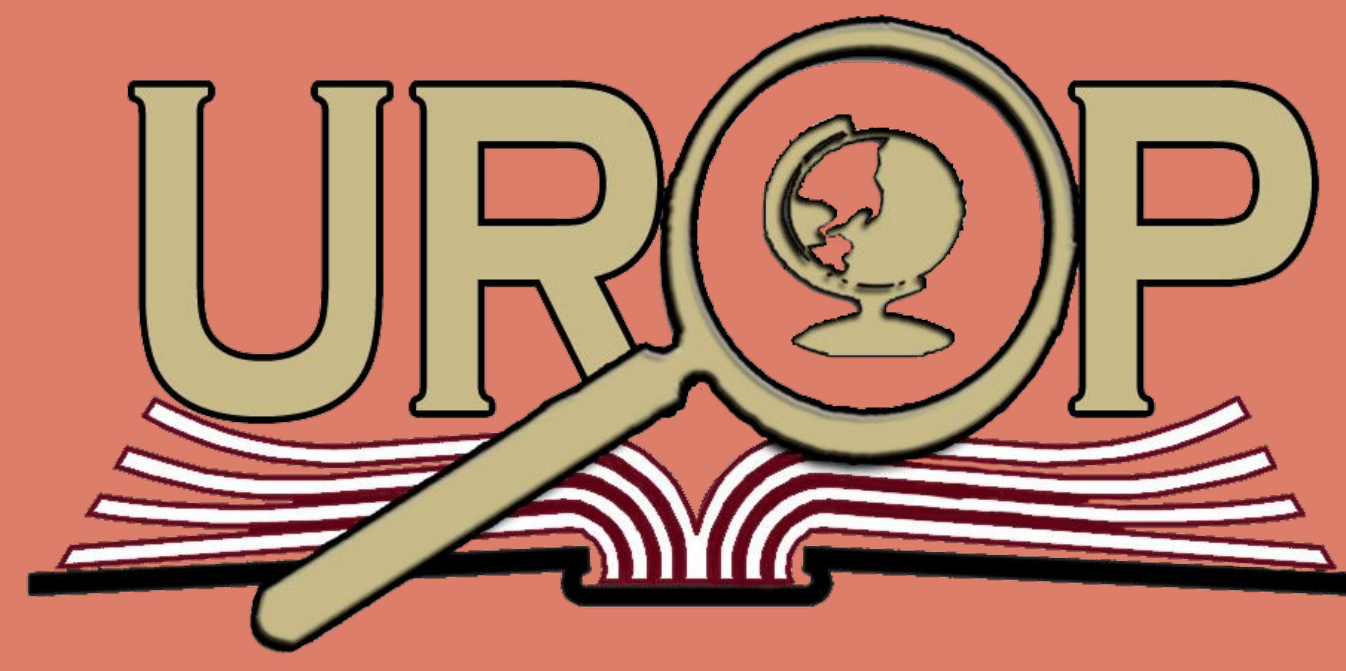


Exploring Apparel Options for NICU Mothers: Development of a



Nursing and Kangaroo Care Garment System

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Abstract

Kangaroo Care and breastfeeding are important steps in a mother's postpartum journey with her infant. There are numerous physical and psychological benefits to both the mother and infant when initiating these types of care. In the neonatal intensive care unit (NICU), these benefits are even more important as NICU infants often require extra medical intervention to become healthy, and these interventions can sometimes isolate them from the mother. When facilitating this care, mothers sometimes struggle due to the infant's more fragile state. Few garments exist to help facilitate both breastfeeding and kangaroo care in a premature infant. To understand the aspects such a garment would require, we researched current products on the market and compared them to literary pieces written on the topics of breastfeeding and kangaroo care. From this data, we designed a prototype garment via the 4 stage design process. This process included the problem identification, conceptualization, prototype, and solution of a garment. We then constructed this final garment based on the user needs we concluded were most important: compression fabric with the ability to stretch, temperature cooling, durable and weight bearing, adjustable sizing, access to breasts, and compatibility with medical devices. By creating an easy to use breastfeeding and kangaroo care garment, more mothers will take part in this important postpartum step improving the physical and emotional health of future generations of mothers and their infants.

Introduction

- Kangaroo Care (KC) is defined as the skin-to-skin contact initiated when a parent holds their infant in an upright swaddled position on their bare chest (Benoit et. al, 2015).
- KC has been proven to have numerous health benefits on both the infant and postpartum mother such as temperature regulation, increased maternal milk volume and breastfeeding outcomes, and decreased rates of infant infection and illness (CDC, 2020).
- KC helps improve the relationship between mother and baby while trying to bond. It is also a long cost method to help regulate temperature and decrease sickness.
- These benefits are even more important for the more vulnerable population of preterm infants that require care in a neonatal intensive care unit (NICU).
- Pregnancy and birth are stressful experiences for a mother and her infant thus the postpartum care they receive is crucial to developing healthy infant-mother relationships and improving infant and maternal health.
- There are few garments designed to suit the needs of both the mother and infant in NICU settings alongside very little research done on this design process.
- There are many design features that aid both mother and baby. For example, some garments help with shrinking the uterus back to its original pre-pregnancy size
- Many KC garments offer different features to aid both mother and baby so it's important to gather those pros and cons of current garments in order to create the best garment for NICU mothers thus why we conducted research on current products on the market.
- We created a survey to research the needs and wants of NICU mothers based off of their personal experience. These survey results help to confirm what is needed in a prototype.

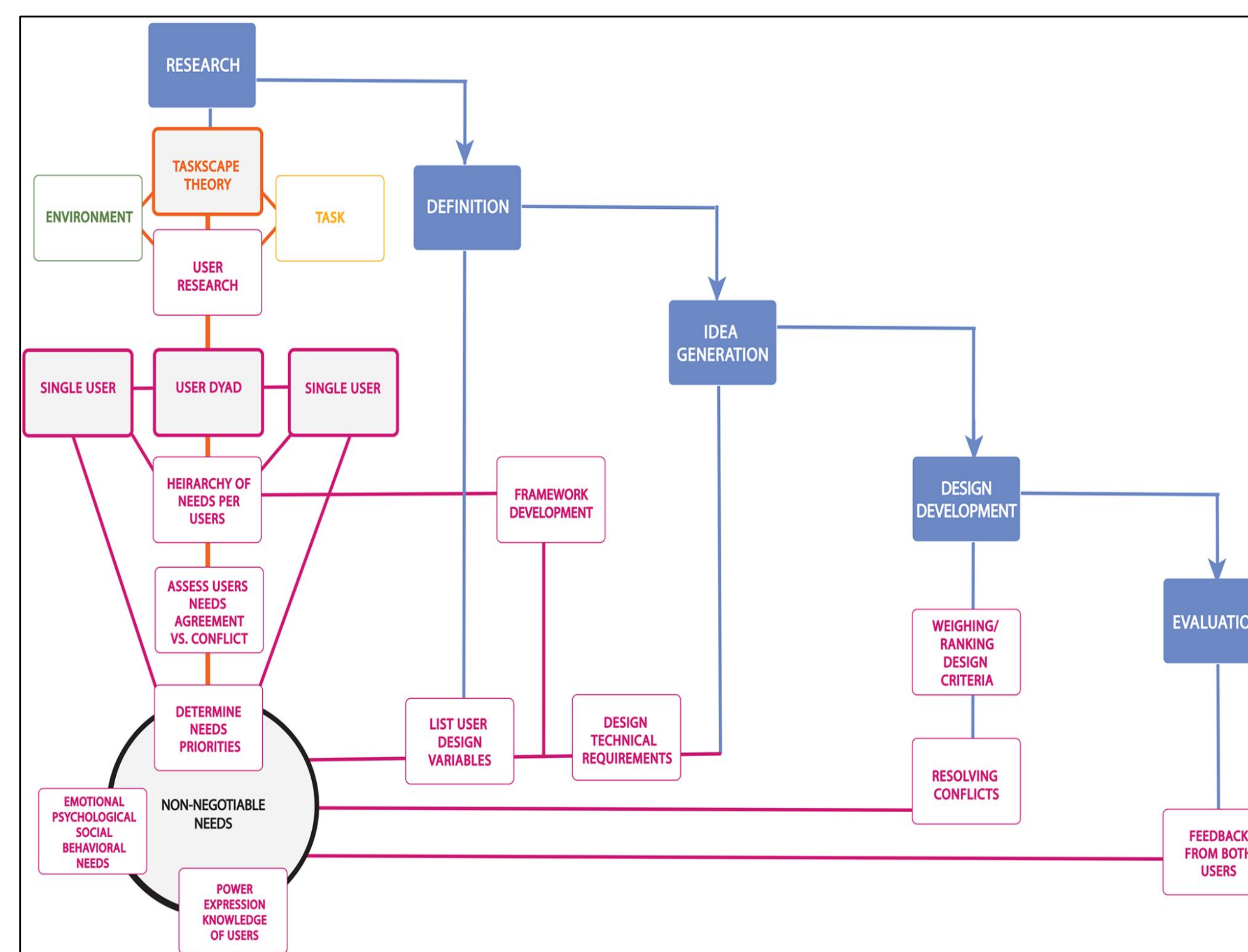
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Methods

- We worked to design our prototype via the 4 stage design process: problem identification, conceptualization, prototype, and solution.
- For problem identification, we conducted market research on kangaroo care/breastfeeding garments currently on the market.
- We followed the SUD model which is a way to organize research collection and design elements when researching two users needs which is extremely important in kangaroo care. (see Figure 1.1)

Figure 1.1



Results

- We found the most important needs of a kangaroo care/breastfeeding garment to be organized in two categories, fabric choice and design.
 - Fabric Choice
 - Compression fabric with ability to stretch: supportive and able to move with baby
 - Temperature cooling: not sweat inducing and overwhelming to mom/baby
 - Durable and weight bearing: able to support baby hands free
 - Design
 - Adjustable sizing: garment can grow with changing body of mom/baby
 - Access to breasts: easy breastfeeding capabilities
 - Compatibility with medical devices on baby: able to support an ill NICU baby
- Our initial prototype design incorporated these needs.

Conclusion

- With the components of our garment, the goal is for mothers to wear the garment into NICU settings and have the capability to scrub in to this sterile environment while still wearing the clothing piece.
- These components contribute to our garment's use:
 - Mesh back: allows for temperature regulation in mother, reduces body heat and sweating
 - Baby wearing pocket: provides support to hold infant on chest
 - Detaches to allow for easy breastfeeding
 - Wrap around component: provides coverage to mother for breastfeeding modesty and warmth to infant
 - Soft, warm material of wrap: Keeps infant warm and soothes baby
 - Athletic material of base tank top: Temperature regulates mother, reduces sweat, cooling component
 - Stretch material to growth with baby/mom
 - Mid-thigh length of garment: no chafing against possible c-section scar of mother and provides modesty
 - Tank top design: no overwhelming heat caused by sleeves, able to be worn under scrubs
 - Clips on sleeves: holds any medical devices or chords coming from infant
 - Base layer of garment: provides support to mother's breasts while wearing
 - Elastic waistband: provides compression support to infant and mother while allowing for growth
- **Limitations:** Every pregnancy and NICU experience is different so while trying to create the best overall garment, not every person will be 100% satisfied with the features
 - In the future, more information can be gathered about women's preferences with a kangaroo care garment

Initial Prototype Sketches

