

A Study on Nursing Bra Design: Prioritizing Comfort and Functionality

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Abstract: *This study focuses on developing an innovative hybrid nursing feeding bra that caters to the unique needs of breastfeeding mothers. The research aims to design a bra that provides comfort, support, and versatility, accommodating the dynamic changes in breast volume and the physical demands of active nursing mothers. By incorporating insights from the UserCentered Design (UCD) framework and feedback from lactation consultants and textile experts, the study identifies key design elements such as breathable, hypoallergenic fabrics, ergonomic structures, and adjustable features. Practical tests revealed preferences for materials like cotton and bamboo blends, seamless designs, and user-friendly attachment mechanisms. The findings emphasize the importance of a flexible and secure fit that adapts to the changing bodies of nursing mothers, enhancing their breastfeeding experience and overall wellbeing. The study concludes with recommendations for future designs to continuously integrate feedback from nursing mothers, ensuring their needs for comfort, functionality, and practicality are met.*

Keywords: nursing feeding bra, breastfeeding mothers, User Centered Design, ergonomic design, flexible fit

1. Introduction

For the health and wellbeing of mothers and their newborns, breastfeeding is a normal and vital practice. The necessity of nursing mothers having nursing bras that are both comfortable and functional has gained more attention in recent years. It has long been the case that nursing moms' unique needs were not taken into account when designing sports bras and nursing bras separately. (Crawford, 2018) But as the literature indicates, there is a research gap in creating a hybrid sports bra/nursing bra that can meet the various needs of nursing mothers. (Gorea and others, 2020) Given the dynamic variations in breast volume and the discomfort that nursing moms may feel when nursing their babies, it is clear that a nursing bra that is adjustable and provides sufficient comfort, support, and versatility.

This is especially crucial when taking into account the possible effects on moms' general wellbeing and their experience breastfeeding. (2011, Nursing Bra). This study will focus on developing an everyday nursing bra that not only supports physical activity but also caters to the special demands of breastfeeding mothers in an attempt to close this gap. (Crawford, 2018) This study is to build a nursing sports bra that is suited to the context of use, design requirements, and design features required to meet the physical activity and breastfeeding goals of its users by combining the insights from the UCD framework and resolving key research questions. (Chan and others, 2001) (Crawford, 2018)

It can, however, also provide difficulties for moms, particularly in terms of locating sensible and comfortable attire for nursing in public. Research has demonstrated that this has an effect on the length of breastfeeding; mothers who are comfortable nursing in public tend to nurse their babies for longer. (Hauck and others, 2020) It's also critical to take into account the demands of physically active nursing moms,

as they need specific apparel to support both their breastfeeding and physical activity responsibilities. (Iacovidou, 2014) Studies have indicated that there is a considerable demand for better nursing supplies, especially sports bras made for active breastfeeding mothers. (Gorea and others, 2020)

Designing a nursing bra that offers sufficient support and comfort requires an understanding of the variations in breast volume that nursing moms go through, particularly while engaging in vigorous activities. The ability to customize options and personalize nursing bras can provide mothers with a feeling of comfort and control. (Tateoka & Isono, 2022) (Gorea and others, 2020) The development of a hybrid nursing/sports bra that tackles the physical changes experienced by nursing moms, including the increase in breast volume and weight, is imperative (Crawford, 2018). The purpose of this study is to fill a vacuum in the literature by developing a nursing bra that is adaptable and meets the demands of breastfeeding women who are physically active. (Liang and others, 2020)

It is crucial to understand the context of usage and the design elements necessary for both physical activity and breastfeeding in order to guarantee that the nursing sports bra satisfies the needs of its users. This study seeks to examine particular research issues concerning the context of usage, design requirements, and the effectiveness of the nursing bra prototype in fulfilling the demands of the market for which it is intended. It will do so through the incorporation of insights from the UCD framework. (Ignazio, D. (2016) The goal is to design a bra that not only offers the support required for physical activity but also ensures the ease and comfort of nursing, by combining elements of both sports bras and nursing bras.

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This approach will address the unique needs of physically active nursing moms, improving both the quality of nursing experiences and the health of the mothers in the long run. (Breast milk acceptance by infants following mother activity., 2002) In order to meet the specific needs of this target market, we will investigate the design requirements and features of nursing bras in the upcoming sections, with a focus on those made for physically active breastfeeding moms. (Tateoka & Isono, 2022) (2011, Nursing Bra) By analyzing the connection between the demands of nursing moms and infants and the clothing substitutes that are currently available, this study seeks to offer helpful guidance (McKinney & Ghalachyan, 2013).

2. Methodology and Discussion

Materials and Design for Comfort: The study adopted an extensive two - phase approach. Initially 150 nursing women who answered to a survey about their knowledge and experiences with nursing bras were incorporated in the cohort. The most effective techniques for the material and design features were then obtained through discussions with lactation consultants and textile professionals. To assess various textiles and attachment techniques for both functionality and usability, practical tests were carried out. Three main criteria were breathability, softness, and flexibility to varying breast sizes. The top finalists included blends of cotton, bamboo, and cotton/bamboo. These fabrics offered a soft feel, flexibility, moisture management, breathability, durability, and form maintenance even after many washings. Designers strayed from traditional structures to incorporate molded cups, broader straps, and a seamless silhouette for enhanced comfort. As expected, our survey revealed a preference for bras without underwires and minimal stitching due to their reduced likelihood of irritating sensitive skin and disrupting milk ducts.

Ergonomic Considerations and Survey Results: Nursing mothers can effortlessly breastfeed their babies thanks to the ergonomic design of nursing bras, which also emphasizes comfort. According to the study, nursing bras featuring a crossover design made it easier to go in and out without having to take the bra off entirely, which improved the breastfeeding experience. We conducted a poll with nursing mothers as part of our inquiry to get their thoughts on usability and comfort levels during the day. Participants said that bras with a full - drop cup shape allowed for better skin - to - skin contact with their newborns and easier latch - on for breastfeeding. Another important ergonomic discovery was the need for broader shoulder straps and supportive bands to transfer weight without generating discomfort or strain on the shoulders and back. Breathable, hypoallergenic fabrics were also popular for preventing skin irritation and ensuring comfort during long - term wear, which is especially crucial for people living in warmer areas or suffering postpartum hormone shifts. The survey results also showed a preference for adjustable elements such as straps and band extenders that adapt to nursing moms' changing bodies. The findings highlighted the need for a fitting that is both flexible and secure, allowing for the daytime and lactation changes in breast size.

Innovative Attachment Mechanisms: The attachment mechanism is critical in nursing bra design, pushing us to consider numerous possibilities. Traditional hook - and - eye closures, magnetic clips, and one - hand access solutions were also tested. The one - handed - access design, which allows women to open the cup with one hand while carrying their infant with the other, has been praised for its convenience. However, modern magnetic clips have proven to be both inventive and divisive. Some participants expressed worries over the strength and reliability of the device, despite its ease of use and unobtrusive nature. The study advises that such methods be refined and tested on an ongoing basis to ensure that they suit the practical requirements of moms.

Feedback - Driven Improvements: The study steered design enhancements toward a more compassionate approach after considering survey input. It became clear that moms wanted features like side slings inside the cups, ventilated mesh panels, and leak - proof layers in nursing bras. The aesthetics of the bras were also taken into consideration, with several participants expressing a desire for designs that combined attractiveness with functionality. This urged the creation of nursing bras with delicate laces, a variety of color options, and designs that meet both aesthetic and functional purposes.

Functionality and Lifestyle Adaptation: Factors related to lifestyle are also essential to consider. Nursing mothers frequently multitask, thus the study found a strong interest in nursing bras that enable easy access without sacrificing modesty, which is critical for those who need to give birth breastfeeding in public or while engaged in other activities. To enable a smooth transition between nursing and other everyday activities, the idea of creating bras with covert nursing panels or ones that resemble conventional bras was inspired by this. Furthermore, the durability of nursing bras was a common topic. High - quality, long - lasting materials ought to be prioritized during the design process, according to respondents who stressed the necessity for items that can resist frequent washing and wear.

Implications for Future Design: This study highlights the need of involving nursing mothers in the design process to ensure that their comfort and functional demands are satisfied. Future designs should be iterative, taking into account continually feedback from the target population to improve comfort and practicality. Respondents like the idea of many hooks and eyes for adjustment, comfortable shoulder straps, easy - to - clean fabrics, and drop cups. Many recommended using designs that improve breast health, like those that reduce the risk of clogged ducts or mastitis, and antimicrobial textiles for preserving hygiene as an innovative touch.

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3. Conclusion

The study concludes that comfort, functionality, skin - friendly materials, ergonomic designs that facilitate easy

nursing, and practical, easy - to - use attachment mechanisms. Nursing bras should be a fusion of science and empathy, engineered to meet the anatomical and emotional needs of new mothers. With ongoing research and customer feedback integration, the design of nursing bras can continue to evolve, offering better support, comfort, and convenience for breastfeeding mothers. Recommendations include the adoption of new fabric technologies, design alterations for maximum support and minimal discomfort, and innovative attachments that simplify the nursing process.

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