
Examining the Design Requirements of Functional Maternity Hospital Gowns Through User-Centered Design

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Hospital gowns are usually made according to a one-size-fits-all standard for both males and females. Hospital settings and situations which require great attention are pregnancy, birthing, and delivery, due to the specialized needs of laboring and postpartum women throughout the different stages of labor (Chiesa, 2017). However, the current design of A-line woven dress gowns with full back openings is physically and emotionally uncomfortable, not functional, and revealing. The archaic gowns do not align with shifting ideals about shared decision making and personalized care in the medical industry, and there are great dissatisfactions with maternity gowns among laboring/postpartum women and health practitioners (Laneri, 2018).

Therefore, research is needed in order to reform the traditional hospital maternity gown for its fragile materials, revealing and ineffective designs, and uncomfortable fit that has been used and unchanged over the past few decades. The purpose of this research was to understand the design requirements of both patients and practitioners for a functional and sustainable maternity hospital gown design. The researchers applied a user-centered design (UCD) framework (Morris, Park, & Sarkar, 2015) to propose a prototype based on data from market research and focus group interviews: (1) specify the context of use by identifying the people who will use the product and what they will use it for, (2) determine business requirements or user goals for the product to be successful and (3) create design solutions drawing on the experiences and knowledge of users (Morris et al., 2015).

Stage 1 included conducting market research of both hospitals and retailers and interviews with practitioners and patients. To assess current hospital gowns being used, a total of 83 gown photographs were collected by contacting 23 different birthing places. The collected images were coded by brand, material, closures, sleeve length, chest openings, print/pattern, neckline, color, and other features using MaxQDA, a qualitative data analysis software. Designs of maternity gowns from 25 leading retailers who sell maternity gowns were also analyzed for market research. Phone interviews were conducted with two obstetrical nurses at birthing places and four face-to-face focus group interview sessions were conducted with a total of 15 women who had prior experience wearing maternity hospital gown within the past 3 years. The researchers asked a series of questions regarding their past and current experiences wearing hospital gowns,

dissatisfactions, physiological and psychological needs, and strategies to enhance the designs of current hospital gowns. In *Stage 2*, the interviews were transcribed verbatim and analyzed using template analysis, which is a qualitative analysis method where templates of priori codes are developed to thematically organize and analyze qualitative data (King, 2004). An initial template was prepared based on literature and market research and was modified during the analyzing process. In *Stage 3*, three maternity hospital gowns were designed based on the results from interview data and Lectra Modaris was actively used for the design process.

The results revealed that current hospital gowns are primarily woven polyester and cotton with shorts sleeves. Most of the gowns had no openings on the chest, and seven of them offered breast feeding slits or were kimono style. All of the gowns featured either tie or snap closures with a full back opening. The greatest dissatisfactions from the participants included the gowns being too big (both in length and width), not modest, stiff from being washed several times, difficult to put on and take off, as well as having inconvenient closures and limited skin-to-skin contact with their newborns. Physiological needs included *flexible fit for a variety of body shapes and sizes, tactile and thermal comfort, convenient donning/ doffing and mobility, accesses for medical devices and procedures* (i.e. epidural and IV administrations), *and skin-to-skin contact*. Psychological considerations included *self-esteem with body changes and modesty*. Other design features included easier breastfeeding access, more memorable colors or prints to contribute positively to their birthing experiences, and having the option to choose different colored gowns.

Based on the analysis, a two-piece stretchy gown design with anti-microbial treated cotton blend jersey knit and washable nursing breast pads inserts was constructed: a marker layout using Accumark software was also developed for mass-production. The top features crisscrossed, overlapping panels with slits sleeves with an elastic under-bust band placed right below the chest, similar to a bra top. The skirt bottom has an elastic waist band and an overlapping slit down the back with one side pocket to hold small electronic devices and belongings. The design was reviewed by two practitioners with professional experience of more than 20 years in a labor /delivery and postpartum setting. The final design was modified based on their comments. Patients, healthcare practitioners, and health insurance organizations would all benefit from the results of this study and the proposed design would improve patient privacy and dignity while meeting an effective supply chain strategy for mass production. The researchers will extend the study to stage 5 within the UCD framework to include wear-testing, implementation of the mass-produced gowns at a local birthing institution, and patient satisfaction surveys of the new design.

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