

**DESIGN SOLUTION FOR MATERNITY WEAR IN PUBLIC
HEALTHCARE HOSPITALS**

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**DESIGN SOLUTION FOR MATERNITY WEAR IN PUBLIC
HEALTHCARE HOSPITALS**

**A dissertation Submitted in Partial Fulfilment of the Requirements for
the Master Degree in The Department of Clothing and Textiles**

**By
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ॐ नमः शिवाय

"I bow to Lord Shiva, the supreme consciousness."

Dedicated to My Mother and Father

This work is a testament to their unconditional love, care, and support. My father's blessings and teachings continue to guide me every step of the way. My mother and brother have been my pillars of strength, standing by me through every challenge, offering endless encouragement and unwavering support. This achievement is as much theirs as it is mine.

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Dhruvika Pat

CERTIFICATE

This is to inform you that research work presented in this dissertation entitled “*Design Solution for maternity wear in Public healthcare hospitals*” in pursuit of partial fulfilment of the Master’s Degree in Clothing and Textiles is the original bonafide work of the student Ms. Dhruvika Patel.

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Plagiarism report

Plagiarism report

ABSTRACT

Childbirth is a transformative experience, yet many postpartum women in public hospitals face challenges due to inadequate maternity wear. In India, where approximately 25 million births occur annually, postpartum care is crucial for maternal recovery. However, existing hospital gowns often lack comfort, breathability, and accessibility, making breastfeeding and medical procedures difficult. This study aimed to identify postpartum women's clothing needs in public hospitals, develop adaptive maternity garments, and evaluate their usability and acceptability.

The research was conducted at GMERS Medical College & Hospital, Gotri, and SSG Hospital, Vadodara, using an applied research approach. A mixed-methods methodology, including surveys, interviews, and observations, identified gaps in existing maternity wear. Findings revealed that standard hospital gowns are restrictive and inadequate, forcing many women to rely on non-breathable nightgowns due to economic constraints.

To address these challenges, six maternity wear prototypes—three one-piece outfits and three top-bottom sets—were developed using sustainable fabrics like Khadi cotton and linen. The garments featured adjustable openings for breastfeeding, improved coverage, and breathable fabrics for hygiene and comfort. Wear trials with 12 postpartum women assessed fabric softness, stretchability, accessibility, and overall satisfaction, showing significant improvements in comfort, mobility, and dignity.

This study concludes that well-designed postpartum maternity wear enhances the hospital experience for new mothers by ensuring comfort, mobility, and breastfeeding accessibility. It advocates for implementing specialized maternity wear in public hospitals, bridging the gap between affordability, sustainability, and functionality to improve postpartum care and maternal well-being

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CHAPTER I INTRODUCTION

"Wrap her in comfort, wrap her in care."

Anonymous

The process of childbirth is a universal experience, with around 140 million births occurring worldwide each year (WHO, 2022). However, birth rates vary significantly across regions, with developed countries experiencing lower fertility rates due to factors like urbanization, delayed pregnancies, and access to contraception, while developing nations tend to have higher birth rates (UNICEF, 2023).

In India, nearly 25 million births occur annually, making up 18 per cent of global births (NFHS-5, 2021). The country has witnessed a steady decline in its birth rate, dropping from 32 per 1,000 in 1981 to 17 per 1,000 in 2023. The Total Fertility Rate (TFR) has also declined to 2.0, approaching the replacement level of 2.1 (SRS, 2023). Despite this national trend, regional differences persist, with states like Bihar (25.8) and Uttar Pradesh (25.4) per 1,000 recording the highest birth rates, while Kerala (13.3) and Tamil Nadu (14.5) per 1,000 have some of the lowest.

Within Gujarat, the birth rate stands at 18.2 per 1,000 which is slightly higher than the national average (SRS, 2023). This decline in birth rate over the years has been attributed to improved healthcare facilities, increased female literacy (70.73 per cent), and greater awareness of family planning (Census, 2011). Urban centres like Ahmedabad, Surat, and Vadodara have lower birth rates compared to rural areas, where access to contraception and reproductive health education remains a challenge.

In Vadodara, the birth rate is 13.0 per 1,000, based on 31,364 births recorded in 2023 and a total population of 2.4 million (VMC, 2023). This lower birth rate, compared to state and national levels, reflects better access to healthcare, effective family planning programs, and improved socio-economic conditions. As birth rates continue to evolve, the need for enhanced postpartum care and support becomes increasingly important, including comfortable and functional maternity wear those aids in the recovery and well-being of new mothers.

Research and real-life experiences indicate that the standard hospital gown often presents challenges for postpartum women, including discomfort, restricted movement, and

breastfeeding difficulties. Syed et al. (2022) conducted a qualitative study that explored the experiences and perspectives of stakeholders involved in the hospital gown life cycle. The study found that hospital gowns are not designed with patient comfort in mind, often leading to embarrassment, exposure, and restricted mobility. Patients and clinicians highlighted that standard gowns have many functional limitations, including difficulty in breastfeeding due to improper openings and discomfort caused by inadequate fastening and loose material. Additionally, non-absorbent fabrics and staining issues were reported as major concerns, especially in postpartum care.

Furthermore, the study emphasized that stakeholders such as manufacturers and launderers focus more on cost-effectiveness and alignment with healthcare procedures rather than patient-centered improvements. Limited access to comfortable maternity wear, particularly for economically disadvantaged women, further exacerbates health and hygiene issues. Addressing these challenges through improved fabric choices, stain-resistant materials, and user-friendly designs can significantly enhance postpartum comfort, recovery, and dignity (Syed et al., 2022).

Improving healthcare for mothers and outcomes requires closing this key care gap. By focusing on the needs and comfort of new mothers, it may foster a more pleasant and encouraging environment that promotes positive outcomes for both mother and their infant. In order to create a solution that will help new mothers and healthcare providers alike, the research aim was to highlight the demand of maternity clothes that are practical, comfortable, and respectable.

After giving birth, women deserve care that addresses their physical and emotional needs. Women need to feel supported and comfortable throughout this important stage in their lives. Feelings of loneliness, stress, and dissatisfaction can arise from this. In addition to becoming overwhelmed and nervous, new mothers may have no idea how to go about getting support. It could be challenging for them to take care of themselves and their baby if the clothes too are uncomfortable or unpleasant as well. In this case, a new mother could feel self-conscious or uncomfortable if she is wearing a hospital gown that is not made considering her needs. Poorly designed garments can make self-care and baby care more difficult, adding stress to this crucial time. Clothing should also uphold a mother's dignity and maintain hygiene, ensuring she feels secure and supported during postpartum recovery.

Health care providers might discover it more challenging to do their job effectively if the maternity wear is inadequate. They can experience irritation and dissatisfaction which might decrease the quality of care they provide. Both the patient and the healthcare provider might discover it challenging, for example, if a new mother's clothing interferes with the examination process, this may result in poor medical results. Inappropriate maternity wear might have an impact on interactions between health care providers and patients. When women have to wear uncomfortable or disrespectful clothing, they may feel mistreated and disrespected. This can lead to a breakdown in relationship of confidence and interaction between patients and healthcare providers, with significant implications for health outcomes.

It is important for healthcare providers to pay attention to the needs of pregnant women and provide them with comfortable and practical apparel. This can help improved healthcare results, promote satisfaction with care, and support the well-being of new mothers and new-borns. This study aims to solve the gap in existing maternity wear in public healthcare hospitals by creating, constructing, and evaluating clothing that meet the needs of postpartum women, and evaluating the influence of these clothes on postpartum outcomes, by employing input from new mothers and healthcare providers.

1.1 Rationale of the Study

Postpartum women in public healthcare hospitals often experience discomfort due to the lack of hospital-provided maternity clothing after childbirth. While they receive a gown for the operation theatre (OT) for one day, no clothing is provided in the ward, leaving them to rely on their own garments. Many women wear nylon knit nightgowns, which are non-breathable, uncomfortable, and prone to bloodstains that are difficult to remove. Additionally, some mothers, especially from economically weaker sections, do not have adequate clothing, forcing them to manage with old, worn-out, or insufficient garments, further compromising their comfort, hygiene, and dignity.

Research Evidence

- Syed et al. (2022) emphasized that standard hospital gowns fail to meet patient needs, often causing discomfort, embarrassment, and restricted mobility, particularly for postpartum women. The
- study found that inadequate fastening, non-absorbent fabrics, and lack of breastfeeding-friendly openings contribute to inconvenience and distress.

- Preliminary field observations in Vadodara confirm that many women face challenges managing bloodstains, lack of ventilation, and restricted movement due to the clothing they bring from home. Additionally, some economically weaker women do not have proper maternity wear, making postpartum recovery even more difficult.

This study aimed to analyse the challenges faced by postpartum women due to the lack of suitable maternity wear and propose design solutions that improve comfort, hygiene, and functionality. Enhancing maternity wear can support postpartum recovery, improve maternal well-being, and ensure dignity for all new mothers, regardless of their economic background.

1.2 Objective of the research

1.2.1 To identify the needs and preferences of postpartum women in public healthcare hospital

1.2.2 To design postpartum maternity wear that meets the needs of the target group

1.2.3 To test the usability and acceptability of the designed maternity wear

1.3 Delimitation of the study:

This study focuses on postpartum maternity wear in public hospitals, specifically at GMERS (Gujarat Medical Education and Research Society) Medical College & Hospital, Gotri, and SSG (Sir Sayajirao General) Hospital in Vadodara.

CHAPTER II

REVIEW OF LITERATURE

This comprehensive literature review establishes a contextual framework that informs the study's methodology and analysis, ensuring meaningful and impact findings. Given the research focus, the researcher thoroughly examined relevant theoretical literature and existing studies related to the subject.

Literature was sourced from credible online databases and the Smt. Hansa Mehta Library at The Maharaja Sayajirao University of Baroda, ensuring a well-rounded perspective. The collected literature was then systematically organized and discussed across various sections and subsections, providing a structured approach to understanding the topic and identifying key gaps that this research aims to address.

2.1. Theoretical Review

2.1.1. Comfort

2.1.2. User-centred design

2.1.3. Anthropometric design

2.1.4. Design solution

2.1.5. Sustainable design

2.1.6. Blood composition and its effect on stain removal

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2.2.7. Cultural and socioeconomic factors in maternity wear

2.2.8. Psychological and emotional comfort in maternity wear

2.2.9. Role of postpartum garments in maternal recovery

2.1. Theoretical review

The study of maternity wear aligns with several theoretical perspectives that emphasize the importance of comfort, design, and user-centred approaches in healthcare garments.

2.1.1. Comfort

Comfort in apparel is a multifaceted concept influenced by physiological, psychological, and environmental factors. It is commonly defined as a state of contented well-being and the absence of discomfort. Several researchers have studied and defined comfort in clothing, emphasizing different aspects such as thermal regulation, moisture management, and fabric interaction with the human body.

Hollies and Goldman (1977) describe clothing comfort to personal preferences and external conditions. They maintain that comfort is influenced by multiple factors, including thermal, ventilation, construction, and psychological aspects of clothing.

Mecheels defines comfort as a dynamic interaction between clothing and the external environment. He highlights that comfort-related parameters maintain the equilibrium of the system, ensuring that the wearer experiences a balanced and pleasant sensation. His work focuses on the thermal and moisture management properties of textiles, emphasizing that fabric properties significantly affect comfort levels.

Subramaniam and Chandramohan (1998) further elaborate on this by identifying thermal insulation and moisture management as critical factors determining clothing comfort. They explain that effective thermal insulation helps maintain body temperature, while proper moisture management facilitates perspiration evaporation, preventing discomfort caused by sweat accumulation. Their work underlines the role of fabric composition and structural properties in enhancing wearer comfort.

From these readings, it is evident that clothing comfort is a complex phenomenon that involves an interplay of multiple physical and psychological factors. The findings from these researchers provide a foundational understanding.

Factors influencing comfort in apparel

The comfort of clothing can be analysed through several factors, which include:

- i. **Thermal comfort** – The ability of a garment to provide adequate warmth or cooling by regulating heat transfer between the body and the environment.
- ii. **Moisture management** – Clothing should allow perspiration to evaporate efficiently to prevent discomfort caused by dampness.
- iii. **Tactile comfort** – The feel of the fabric against the skin, including smoothness, roughness, or irritation.
- iv. **Fit and ease of movement** – The way clothing conforms to the body and allows unrestricted motion plays a significant role in perceived comfort.
- v. **Psychological comfort** – Subjective feelings related to aesthetics, fashion preferences, and personal comfort perceptions.

Environmental and seasonal variations in comfort

- i. According to **Kori (1992)**, Comfort is not a static property; it changes based on environmental conditions. comfort in one season may not be the same in another. This is because temperature, humidity, and wind influence how clothing interacts with the human body. In warmer seasons, breathability and moisture-wicking properties are essential for comfort, whereas in colder seasons, insulation and heat retention become the primary concerns.

ii. Temperature and thermal comfort

Temperature plays a crucial role in determining the comfort of clothing. In cold weather, clothing needs to provide adequate thermal insulation to retain body heat, while in hot climates, garments should promote ventilation and allow heat dissipation. Mecheels highlights that clothing comfort is largely dependent on its thermal insulation properties and ability to regulate body temperature. Thermal comfort is achieved when there is minimal heat loss or gain, ensuring that the body remains at an optimal temperature.

iii. Humidity and moisture management

Humidity levels impact comfort by affecting perspiration and moisture transfer. In humid conditions, the ability of a fabric to wick away sweat and allow evaporation is critical for maintaining comfort Hollies and Goldman discuss the interaction of thermal ventilation and fabric construction in moisture management. If moisture is trapped between the fabric and the skin, it can cause discomfort, stickiness, and even

skin irritation. In contrast, in dry conditions, excessive moisture loss can lead to a feeling of chilliness, especially in winter.

iv. Wind and air permeability

Wind exposure influences comfort by affecting how much heat is retained or lost through clothing. Wind-resistant fabrics help retain body warmth in colder climates, whereas breathable and air-permeable fabrics improve comfort in warm and humid conditions by allowing better airflow. Kori suggests that seasonal changes in wind patterns require adaptable clothing choices that balance protection and breathability.

v. Seasonal adaptations in clothing comfort

Comfort requirements vary across seasons:

- 1) Winter: Clothing should provide high thermal insulation, preventing excessive heat loss while allowing some breathability to avoid overheating. Fabrics like wool, fleece, and insulated synthetics are commonly used.
- 2) Summer: Lightweight, breathable fabrics such as cotton and linen help wick moisture and improve air circulation. Clothing with loose fits enhances comfort in high temperatures.
- 3) Monsoon and humid conditions: Quick-drying, moisture-wicking materials are preferred to prevent dampness and discomfort. Fabrics with antimicrobial properties help reduce odour caused by perspiration.
- 4) Transitional seasons (spring and autumn): Layering is often used to adapt to fluctuating temperatures, allowing wearers to adjust their clothing based on the changing environment.

2.1.2. User-centred design

User-Centered Design (UCD) is defined by the **Interaction Design Foundation (n.d.)** as a methodology that involves users throughout the design process using various research and design techniques to create highly usable and accessible products. It is an iterative process that prioritizes the needs, behaviours', and experiences of users at every stage of development.

UCD ensures that products align with user expectations, making them more intuitive and effective in real-world applications. The process involves key stages such as understanding user requirements, designing solutions, prototyping, and usability testing.

By continuously incorporating user feedback, UCD enhances product usability, reduces errors, and improves user satisfaction.

2.1.3. Anthropometry design

According to **Ruth Trumpold ("1.1a Anthropometrics" webpage)**, anthropometrics is the study of human body measurements used in design to ensure that products fit and function effectively for different users. This concept is widely applied in ergonomics, industrial design, and architecture to create products and environments that accommodate diverse body sizes and shapes.

Anthropometric data is collected systematically and analysed to improve product usability, safety, and comfort. This information is essential in designing furniture, clothing, workspaces, and consumer products, ensuring they meet user needs and enhance functionality. By integrating anthropometrics into design, manufacturers can optimize human-product interaction, support proper posture, reduce strain, and prevent discomfort or injuries.

2.1.4. Design solution

According to **Universal UX Design (2017)**, a design solution is a method or approach developed through identifying the best possible solution, implementing it, refining it, and eventually replacing it with a more effective alternative. It involves designing strategies to address challenges in a sustainable and efficient manner, ensuring continuous improvement and innovation in the design process.

The Design Solution Definition Process, as described by **NASA (n.d.)**, is a structured approach used to translate high-level requirements—derived from stakeholder expectations and logical decomposition—into a concrete design solution. This process involves transforming logical decomposition models and technical requirements into multiple alternative solutions, which are evaluated through trade studies to determine the most suitable option.

2.1.5 Sustainable design

According to the **U.S. General Services Administration (n.d.)**, sustainable design is an approach to building construction and modernization that optimizes performance while minimizing negative environmental and human impacts. This design philosophy

integrates principles such as energy efficiency, resource conservation, and the use of environmentally preferable materials to create healthy, productive, and cost-effective built environments.

Sustainable design aims to reduce waste, lower carbon footprints, and enhance long-term environmental sustainability. It incorporates strategies like passive solar design, water conservation, and the use of renewable energy sources to ensure efficient and responsible resource use. By prioritizing sustainability, this approach contributes to climate resilience, economic savings, and improved occupant well-being.

2.1.6. Blood composition and its effect on stain removal

Blood is primarily composed of various biological molecules that influence its staining properties and the ease of removal (National Centre for Biotechnology Information [NCBI], n.d.).

- i. Proteins (haemoglobin, albumin, fibrinogen)- Proteins coagulate when exposed to heat, making stain removal more challenging. Coagulation binds the stain tightly to fabric fibres, requiring enzymatic treatments for effective removal
- ii. Iron (from haemoglobin)- Reacts with oxygen, leading to oxidation and setting stains over time. Oxidized stains often require reducing agents or enzymatic cleaners for effective removal
- iii. Lipids and fats: Affect stain penetration and require surfactants for effective removal, as lipid-based stains resist water-based cleaning solutions
- iv. Blood ph. and enzyme activity- Blood has a slightly alkaline pH (~7.4), which interacts with different stain removal solutions. Alkaline detergents can help break down protein structures for easier stain lifting.

2.1.7. How different blood groups affect stain removal

According to Dean, L. (2005), studies suggest that blood groups might influence stain adhesion due to variations in protein and antigen compositions. The presence or absence of specific antigens can affect how strongly blood binds to surfaces, ultimately influencing stain removal efficiency.

Blood groups are classified based on the antigens present on red blood cells (RBCs) and the corresponding antibodies present in the serum. These characteristics play a role in how blood interacts with different materials.

Table 2.1: Blood groups and their Antigens and Antibodies

Blood Group	Antigen(s) present on the red blood cells	Antibodies present in serum	Genotype(s)
A	A antigen	Anti-b	AA or AO
B	B antigen	Anti-A	BB or BO
AB	A antigen and B antigen	None	AB
O	None	Anti-A and Anti-B	OO

Influence on stain removal

- Blood group O- Contains less protein content and no A/B antigens, which may make it easier to remove from fabrics.
- Blood groups A and B- The presence of additional carbohydrate antigens may enhance adhesion, making stains more resistant to removal.
- Blood group AB- Since it contains both A and B antigens, stains from this blood type may be the most challenging to remove compared to Group O.

2.1.7. Stages of pregnancy and transformation

According to **Medical News Today (2024)**, pregnancy is divided into four key stages, each marked by significant changes for both the fetus and the pregnant person. These stages often include, the postpartum period, termed the "fourth trimester," plays a vital role in maternal recovery and newborn adjustment

First trimester (weeks 1–12)

This stage is crucial for fetal development. The fertilized egg implants in the uterus and forms an embryo. Major organs, the heart, fingers, and toes begin to develop. By the end of 12 weeks, the fetus is about 3 inches long. The pregnant person may experience fatigue, nausea (morning sickness), breast tenderness, mood swings, frequent urination, and food cravings. Morning sickness can persist throughout the trimester or beyond.

Second trimester (weeks 14–27)

During this period, the fetus undergoes rapid growth, reaching about 1 foot in length and weighing around 1.5 pounds. By the end of this stage, the fetus develops hair, nails, taste buds, and the ability to hear. The lungs form, but they are not yet functional. The fetus also starts moving, and the pregnant person can feel these movements. Physical changes include abdominal expansion, stretch marks, darker areolas, swelling, and skin darkening

in patches. Many experiences relief from early pregnancy symptoms like nausea and fatigue.

Third trimester (weeks 29–40)

Most organs and systems are now developed, and the baby continues to grow, preparing for birth. The bones harden, the lungs fully form, and movements become more noticeable. The fetus opens its eyes and can sense light. Lanugo (fine hair covering the body) sheds, and vernix (a waxy coating) forms. The baby drops lower into the pelvis in preparation for delivery. The pregnant person may experience heartburn, shortness of breath, frequent urination, insomnia, swelling, and Braxton-Hicks contractions (false labour). Anxiety about labour and parenthood is common.

Fourth trimester (postpartum- 3 months after birth)

The postpartum period is a critical transition for both the mother and baby. The body recovers from childbirth, and challenges like postpartum bleeding (lochia), cramping, fatigue, and breastfeeding difficulties may arise. Hormonal shifts can lead to mood swings, and some may experience postpartum depression. Managing this period involves rest, proper nutrition, and seeking support from loved ones or medical professionals.

2.2 Research related review-

2.2.1. Trans-formative tendencies in maternity wear

Research by **Varshney (2023)** emphasized that incorporating sensors into maternity garments allowed for real-time tracking of vital signs such as heart rate, body temperature, and fetal movements. Additionally, adaptive fabrics with stretchable and moisture-wicking properties ensured a comfortable fit throughout pregnancy and into the postpartum period. Innovations by brands like MAS Holdings and Nisshinbo Textile illustrated how maternity fashion evolved to bridge aesthetics and medical utility, making smart clothing a valuable investment for modern mothers.

With advancements in textile technology and changing societal norms, maternity fashion evolved significantly. Smart maternity wear integrated technology and thoughtful design to enhance comfort, functionality, and health monitoring for expectant mothers.

2.2.2. Sensory Comfort, Movement Comfort, Style, and Functionality in maternity wear

Sensory comfort

Hyun-ah Kim's research (2021) contributed significantly to the understanding of the relationships between fiber properties, yarn structure, and fabric performance. By investigating the impact of eco-friendly fibers on thermal comfort and moisture management, **Kim's study (2021)** provided valuable insights into the optimization of textile design for enhanced sensory comfort. The findings of this study had important implications for the development of sustainable and high-performance textiles, highlighting the need for a systematic approach to fabric design that considered the complex interactions between fiber properties, yarn structure, and human comfort.

Ji-Hoon Lee and et al. research (2021) represented a significant advancement in the development of nanofiber membranes with tailored properties for wearable technology and performance fabrics. By creating membranes with moisture-wicking, breathable, and antimicrobial properties, Lee and colleagues' study (2021) demonstrated the potential for innovative textile design to enhance human comfort and performance. The findings of this study had important implications for the development of high-performance textiles, highlighting the need for interdisciplinary collaboration and a systematic approach to textile design that considered the complex interactions between fiber properties, yarn structure, and human comfort.

Movement comfort

The study authored by **Ji-Hoon Lee, Seung-Joo Kim, and colleagues (2021)**, *Moisture-Wicking, Breathable, and Intrinsically Antibacterial Poly (Ionic Liquid) Nanofiber Membranes for Electronic Skin*, discussed how nanofiber membranes with moisture-wicking and breathable properties enhanced comfort in wearable technology and performance fabrics.

Style

Shamsaei, A., et al. (2022) conducted a narrative review on the essential criteria for designing healthy maternity wear, emphasizing the importance of adaptability, comfort,

and stylishness in maternity clothing. Their study highlighted that maternity garments should have minimized the protrusion of enlarged body areas while incorporating suitable colours and designs to foster a positive body image in pregnant women. By enhancing maternal identity through well-designed clothing, maternity wear contributed to both physical and emotional well-being. This review expanded the knowledge of maternity wear designers, enabling them to create garments that improved satisfaction, comfort, and positive feelings associated with pregnancy.

Functionality

According to **Jaiswal (2022)**, the study *Smart Motherhood Wear- A Solution to the Problem of Maternity Wear* focused on improving the functionality of maternity wear by designing garments that accommodated the physical changes during pregnancy. The garments were tailored with extra space in key areas such as the waist, hip, bust, and bicep to ensure comfort and fit, particularly during the second and third trimesters. Using techniques like pattern styling, construction methods, and fabric selection, the study introduced "Smart Motherhood Wear" to provide functional, adaptive clothing that could be worn throughout pregnancy and after childbirth.

2.2.3. Types of maternity wear

Ramya and Banupriya (2022) conducted a study on maternity wear, emphasizing its importance in providing comfort, functionality, and support for women during pregnancy and postpartum recovery. As a woman's body undergoes significant physical changes, including an expanding abdomen, increased breast size, and shifts in overall body shape, maternity wear is designed to accommodate these transformations while ensuring ease of movement and comfort. Their research highlights that maternity wear serves not only a practical purpose but also plays a role in enhancing the confidence and well-being of expectant and new mothers.

Maternity wear is available in different categories to cater to the various needs of women during pregnancy and postpartum. These include maternity dresses and tops, maternity bottoms, maternity lingerie and hosiery, belly bands and foundation extenders, and nursing covers. Each of these categories is designed to address specific comfort and functionality requirements, ensuring that pregnant and postpartum women can maintain an active lifestyle without compromising on support or style.

- i. Maternity dresses and tops- These garments accommodate the growing abdomen, breasts, and arms during pregnancy. Various styles such as tees, tank tops, blouses, sweaters, and dresses are available to ensure comfort without compromising style.
- ii. Maternity bottoms- Designed with elastic belly panels or adjustable waistbands, maternity jeans, leggings, skirts, and trousers provide support and flexibility, preventing discomfort caused by tight pre-pregnancy clothing.
- iii. Maternity lingerie and hosiery- Maternity bras with larger band and cup sizes offer proper support during pregnancy and nursing. Maternity panties and hosiery ensure comfort, while activewear and swimwear allow women to remain physically active.
- iv. Belly bands and foundation extenders- Belly bands (or belly sleeves) extend the usability of pre-pregnancy clothing by offering extra support to pants and smoothing the waistline. Foundation extenders make maternity clothes adjustable and cost-effective.
- v. Nursing covers- Items like shawls, scarves, ponchos, or aprons provide privacy for breastfeeding mothers, allowing them to nurse discreetly in public while maintaining ease of movement.

2.2.4. Common health issue experienced by postpartum women

Marije M. Gmelig Meyling et al. (2023) conducted a systematic review to identify the health problems experienced by women during the first year postpartum in high-income countries. Analysing 25 studies published between 2000 and 2021, the review categorized 83 health issues into five key areas—physical health problems, mental health problems, social health problems, problems related to infant feeding, and other challenges. Common concerns included exhaustion, urinary incontinence, painful breasts, depressive symptoms, lack of social support, sleep disturbances, breastfeeding difficulties, and problems related to sexuality. The study underscored how these postpartum challenges, often overlooked, could significantly affect a woman's overall well-being.

The findings highlighted the need for comprehensive postpartum care that went beyond physical recovery to include mental and social support. Many women struggled with emotional instability, anxiety, and feelings of isolation, indicating a gap in postpartum healthcare services. The study advocated for better healthcare interventions, increased awareness, and stronger support systems to help new mothers navigate these challenges effectively. By addressing these concerns holistically, healthcare providers and

policymakers could improve postpartum experiences and long-term maternal health outcomes.

2.2.5. Maternity clothing issues and challenges

Maternity wear played a crucial role in supporting women's comfort and confidence during pregnancy and the postpartum period. However, several challenges persisted in the design and availability of these garments. Addressing these issues was essential for enhancing the maternity clothing experience.

A study by **Jaiswal (2022)** highlighted those variations in body shapes and sizes during pregnancy led to problems of comfort, fit, and sizing in ready-to-wear maternity apparel.

- i. Comfort and fit – As women's bodies underwent significant changes during pregnancy, finding garments that adapted to fluctuating body sizes was vital.
- ii. Limited style options – Traditionally, maternity wear had been functional but lacked variety and style, often leading to a compromise between comfort and fashion. A discussion on Capitol Hill Style reflected this sentiment, with users expressing dissatisfaction with the plainness of most maternity clothing.
- iii. Affordability – High-quality maternity wear was expensive, posing challenges for economically disadvantaged women. A study on maternity wear preferences in Pakistan found that 30 per cent of respondents did not prefer using maternity garments due to high prices.
- iv. Fabric limitations – The choice of fabrics in maternity wear significantly impacted comfort and maintenance. Pregnant women often experienced increased sweating, making breathable and adaptable fabrics essential. Jaiswal (2022) emphasized that varying body shapes and sizes necessitated flexible fabric choices.
- v. Accessibility and availability – Access to quality maternity wear varied, with some regions offering limited options. This disparity led to challenges in finding suitable clothing that met both functional and aesthetic needs.
- vi. Sustainability concerns – The short-term use of maternity clothing contributed to textile waste. Many garments were discarded after a brief period, ending up in landfills and adding to environmental issues. Discussions on sustainable fashion highlighted this concern, noting that the limited use of maternity clothing exacerbated textile waste problems.

Addressing the challenges

To mitigate these issues, several solutions were implemented:

- i. Design innovations – Garments were developed with adjustable features and stretchy materials to accommodate body changes. For example, high-waisted underwear and nursing bras provided support and ease.
- ii. Affordable options – Brands and policymakers collaborated to offer affordable maternity wear, possibly through subsidies or community programs.
- iii. Sustainable practices – The use of eco-friendly materials and the promotion of garment rental or resale were encouraged to reduce environmental impact. The circular maternity wear economy, comprising sustainable designers, clothing adaptors, rental services, and second-hand or sharing economies, offered practical solutions.

By addressing these challenges through thoughtful design and policies, the maternity wear industry better served the diverse needs of expectant and new mothers, enhancing their comfort, style, and overall experience during this significant life stage.

2.2.6. Public healthcare hospitals

According to **Wikipedia**, a public hospital or government hospital is a healthcare facility that is government-owned and predominantly funded by taxpayer money to support healthcare initiatives. These hospitals focus on providing accessible, affordable, and quality healthcare services, particularly for economically disadvantaged populations.

In the context of maternal and neonatal care, Primary Health Centres (PHCs) play a vital role by offering essential services such as prenatal checkups, delivery assistance, and postpartum care. However, one critical challenge in these hospitals is the maternity wear provided to patients. Due to budget constraints and resource limitations, hospital maternity wear often lacks comfort, functionality, and hygiene considerations, impacting the overall well-being of new mothers.

Improving the design and quality of maternity wear in public hospitals could enhance patient comfort, mobility, and hygiene, contributing to better postpartum recovery experiences.

2.2.6.a. Maternity wear in public healthcare hospitals

Saif Syed et al. (2022) Review of "*Comprehensive Design Considerations for a New Hospital Gown – A Patient-Oriented Qualitative Study*"

i. Gown utility

- The hospital gown was functional for healthcare providers, allowing easy stain identification, access for medical procedures, and patient observation.
- However, it had limitations, such as restricting mobility, interfering with medical equipment, and causing confusion in how to wear it.
- Patients struggled with fastening the gown, leading to discomfort and prolonged bed rest due to fear of exposure.
- Alternative fastening options like buttons, zippers, and Velcro were suggested, but each had drawbacks, such as technical difficulties, skin irritation, and infection control concerns.

ii. Economic considerations

- Balancing healthcare expenses, industry profits, and patient needs was a challenge in gown redesign.
- Manufacturers and launderers highlighted how design changes could have disrupted well-established gown processing systems.
- Cost-saving innovations like using polyester instead of cotton or minimizing seams could have reduced expenses while improving patient experience.
- The concept of "double gowning" (wearing two gowns for better coverage) was identified as a costly but common practice that redesigns could have addressed.

iii. Patient dignity and comfort

- Patients often felt humiliated due to the gown's open-back design, which invaded privacy, especially when walking or being unable to fasten it properly.
- Stakeholders suggested alternative designs, such as front- or side-opening robes, to offer better coverage.
- Cultural sensitivity was a major concern, with patients needing options that aligned with gender identities and religious beliefs.
- Increasing gown variety to improve comfort could have created logistical issues in laundering and ordering processes.

iv. Aesthetic considerations

- The hospital gown's light colours were seen as calming and neutral, but many patients found the design unattractive and embarrassing.
- Some participants compared the gown to a "prison jumpsuit," reinforcing feelings of discomfort and lack of control.
- Providing colour or design options was suggested, though implementation challenges remained.

2.2.6.b. new design solution for maternity wear in phcs

Nelima Barasa (2020) discussed essential design elements in maternity wear that prioritized comfort, aesthetics, and functionality, particularly in hospital settings. The study outlined key features that contributed to the practicality and well-being of maternity garments.

- i. Colour – Light colours enhanced size perception, while dark colours created a slimming effect. Colours also influenced mood and confidence.
- ii. Fabric – Soft, breathable, and stretchable fabrics like cotton provided comfort. Hospital wear required antibacterial and easy-to-clean materials.
- iii. Size and Fit – Proper sizing ensured comfort and flexibility. Adjustable features like elastic waistbands supported body changes.
- iv. Design – Simple yet structured designs with pleats and gathers enhanced comfort. Hospital wear included nursing-friendly and medical-access features.
- v. Texture – Soft, non-irritating fabrics prevented skin discomfort. Smooth or matte finishes helped maintain elegance and concealed body shape.

Maternity wear needed to balance style, comfort, and functionality, especially for hospital use, ensuring both practicality and well-being.

2.2.6.c. Hospital gown redesign

The article "*Redesigning Maternity Hospital Gowns*" by **Hwang, McCoy, and Shaw (2020)** highlighted the need for improved maternity hospital wear, addressing issues of comfort, functionality, and dignity. Using user-centred design (UCD), the study developed a two-piece knit gown with an adjustable waistband, overlapping front panels, and medical access features. Evaluations included wear testing and an online survey of 501 women and 42 practitioners, revealing high satisfaction—82 per cent found it more comfortable, 84 per cent valued its privacy, and 80 per cent would have recommended it. Practitioners also rated it highly, with 78 per cent preferring it over traditional gowns and 71 per cent supporting hospital adoption. While the study effectively demonstrated the

gown's benefits, further research on diverse body types, cost analysis, and sustainability could have enhanced its real-world applicability. The findings underscored the potential for hospitals to replace traditional gowns with this innovative design, improving the maternal care experience.

i. Patient-centred hospital gown redesign

Syed et al. (2022) conducted a qualitative study exploring the limitations of current hospital gowns and proposed patient-centred redesign considerations. The study highlighted key concerns expressed by patients, clinicians, and system stakeholders regarding the gown's functionality, economic feasibility, comfort, and aesthetics. The findings revealed that while the current gown design facilitated medical procedures through features such as large arm openings and open-back access, it also posed significant challenges. Patients experienced discomfort, lack of dignity, and restricted mobility, while clinicians reported issues related to patient examination and equipment interference. Additionally, the study underscored economic challenges in redesigning the gown, as bulk ordering and laundering efficiency limited customization options.

The research offered valuable insights into the need for a redesigned gown that balanced medical utility with patient comfort and dignity. Recommendations included alternative fastening methods, better coverage for privacy, and diverse gown options catering to different cultural and gender-related needs. However, the study also acknowledged implementation barriers, such as cost constraints and resistance to change in hospital processes. Overall, Syed et al. (2022) provided a compelling argument for the necessity of a patient-Centered hospital gown, emphasizing the importance of collaboration between healthcare providers, manufacturers, and policymakers to drive meaningful change in hospital apparel.

2.2.7. Cultural and socioeconomic factors in maternity wear

Maternity wear choices are influenced by socioeconomic status, which determines affordability and accessibility. **Kuppuswamy's** Socioeconomic Classification categorizes families based on income, education, and occupation.

Kuppuswamy Socioeconomic Scale (2023)

The Modified Kuppuswamy Socioeconomic Scale classifies families into five categories based on a scoring system that considers education, occupation, and monthly income.

- i. Education score (highest completed level of head of family)

Table 2.2: Education score

Education Level	Score
Professional degree	7
Graduate	6
Intermediate/diploma	5
High school	4
Middle school	3
Primary school	2
Illiterate	1

- ii. Occupation score (head of family)

Table 2.3: Occupation score

Occupation	Score
Legislators, senior officials, managers	10
Professional	9
Technicians/associate professionals	8
Clerk	7
Skilled worker, shop and market sales workers	6
Skilled agricultural and fishery workers	5
Craft and related trade workers	4
Plant and machine operators and assemblers	3
Elementary occupation	2
Unemployed	1

- iii. Monthly income score (adjusted for inflation - 2023)

Table 2.4: Monthly income score

Monthly Income (INR)	Score
≥146,104	12
580 - 146,103	11
73,054 - 109,579	10
68,455 - 73,053	9
63,854 - 68,454	8
59,252 - 63,853	7
54,651 - 59,251	6
45,589 - 54,650	5
36,527 - 45,588	4
21,914 - 36,526	3
7,316 - 21,913	2
≤7,315	1

iv. Socioeconomic class based on total score

Table 2.5: socioeconomic class based on total score

Total Score	Socioeconomic Class
26 - 29	Upper (I)
16 - 25	Upper Middle (II)
11 - 15	Lower Middle (III)
5 - 10	Upper Lower (IV)
< 5	Lower (V)

Table source: <https://ihatepsm.com/blog/modified-kuppuswamy-scale>

2.2.8. Psychological and emotional comfort in maternity wear

Weigle and McAndrews (2023) explored the concept of psychological and emotional comfort in maternity wear in their research *"Exploring the Transfer of Affect Through Clothing – Maternity Wear on Consumer Well-Being and Feelings of Parenting."* They emphasized that maternity clothing is more than just functional—it played a crucial role in shaping a woman's emotional well-being and maternal identity. Their study highlighted how aesthetic and emotional comfort in maternity wear significantly influenced maternal-fetal attachment (MFA) and overall psychological health.

Psychological and emotional comfort in maternity wear

i. Aesthetic comfort and well-being

Weigle and McAndrews (2023) suggested that aesthetic comfort in maternity clothing played a crucial role in emotional well-being. Feeling attractive and comfortable in maternity wear strengthened the psychological experience of pregnancy. Women who felt stylish and well-dressed reported a stronger emotional connection with their unborn child, reinforcing the importance of maternity wear beyond mere functionality.

ii. Emotional comfort and maternal identity

Pregnancy brought profound physical and emotional changes, and clothing choices impacted how women perceived themselves during this transition. According to Weigle and McAndrews (2023), well-designed maternity wear helped women feel confident, stylish, and emotionally secure, reducing stress and promoting a positive self-image. When maternity wear aligned with a woman's fashion preferences, it enhanced self-esteem and reinforced her evolving identity as a mother.

iii. Psychological impact of maternity clothing

- Body Image and Confidence – Maternity wear that flattered the changing body shape positively influenced body image, reducing insecurities associated with weight gain.
- Social Perception and Emotional Expression – Fashionable maternity clothing allowed women to maintain a sense of normalcy and social confidence.
- Attachment and Bonding – Comfortable clothing fostered a stronger emotional connection with the baby, reinforcing maternal bonding.

Design considerations for psychological and emotional comfort

Weigle and McAndrews (2023) advocated for maternity wear that prioritized:

- i. Soft, stretchable fabrics that provided comfort without restriction.
- ii. Customizable fits that adjusted throughout pregnancy for continued ease.
- iii. Aesthetic appeal to align with personal style and boost self-confidence.
- iv. Ease of movement to support daily activities and enhance overall comfort.

Role of postpartum garments in maternal recovery

An article from **Putchi** highlighted the importance of comfortable clothing in postpartum recovery for Indian mothers, emphasizing:

- i. Physical Comfort – Breathable fabrics like cotton reduced irritation and infections, while supportive intimate wear aided recovery.
- ii. Mental Well-being – Well-fitting maternity wear boosted confidence, while flexible clothing allowed easy movement.
- iii. Cultural Relevance – Traditional attire (like kurtas and sarees) provided comfort while honouring cultural values, while modern adaptations blended tradition with practicality.
- iv. Practicality – Nursing-friendly designs and versatile maternity wear ensured convenience and long-term use.

By addressing these factors, maternity wear significantly improved the physical and emotional experience of pregnancy and postpartum recovery.

OPERATIONAL DEFINITIONS

Adaptive Clothing: Specially designed clothing that enhance comfort, functionality and hygiene particularly for postpartum recovery.

Maternity Wear: Clothing designed specifically to accommodate the physical and functional needs of postpartum women.

Design Solution: Thoughtful and innovative approaches in garment construction to address the specific needs of maternity wear users.

Comfort: The physical well-being provided by maternity wear, ensuring that postpartum women feel relaxed and unrestricted. It encompasses fabric choice, flexibility, breathability, and ease of movement, allowing mothers to care for themselves and their babies without discomfort.

Dignity: The extent to which maternity wear supports emotional well-being, self-respect, and confidence during the postpartum period.

Public Healthcare Hospital (PHC): Government-funded hospitals providing free or affordable maternity and postpartum care.

Functionality: The practical features of maternity wear that enhance a mother's comfort and dignity during the postpartum period. This includes designs for ease of wear, accessibility for breastfeeding, flexibility for movement, and hygiene-friendly fabrics that support both physical recovery and emotional well-being.

Hygiene: It refers to the ability of selected fabric for maternity wear to maintain cleanliness, by easy removal of blood stains during washing; following standard methods for hospital laundering.

Usability Metrics

Usability metrics assess the functional and comfort-related aspects of maternity clothing, ensuring optimal wearability and practicality for expecting and nursing mothers.

1. Fabric Softness – The level of comfort provided by the fabric against the skin, reducing friction and discomfort.
2. Skin Irritation – The likelihood of the fabric causing itchiness, rashes, or allergic reactions, especially for sensitive skin.

3. **Breathability** – The ability of the fabric to allow air circulation, preventing overheating and promoting comfort.
4. **Absorbency** – The capacity of the fabric to wick away moisture, keeping the wearer dry and comfortable.
5. **Stretch & Flexibility** – The adaptability of the garment to accommodate body changes during pregnancy and postpartum while ensuring ease of movement.
6. **Ease of Wearing & Removing** – The simplicity and convenience of putting on and taking off the garment, particularly considering mobility limitations during pregnancy.
7. **Breastfeeding Accessibility** – The effectiveness and convenience of nursing access, allowing discreet and effortless breastfeeding.
8. **Odor Resistance** – The ability of the fabric to minimize odor retention, enhancing long-term freshness and wearability.

Acceptability Metrics

Acceptability metrics evaluate the emotional, social, and ethical aspects of maternity clothing, ensuring that garments align with user values and preferences.

1. **Dignity & Respect** – The extent to which the clothing maintains a mother’s self-esteem, privacy, and cultural considerations.
2. **Design Aesthetics** – The visual appeal, style, and fashion-forwardness of the maternity garment.
3. **Sustainability** – The environmental and ethical impact of the clothing, including fabric sourcing, production methods, and recyclability.
4. **Overall Satisfaction** – The holistic evaluation of the garment based on comfort, functionality, and user experience.

Chapter III

METHODOLOGY

The research study was conducted on "Design Solution for Maternity Wear in Public Healthcare Hospitals." The primary aim of the study was to create functional and aesthetically pleasing maternity wear that ensures comfort, practicality, and hygiene for postpartum women receiving care in public healthcare hospital. The study employed a mixed-methods approach, incorporating both survey and applied research, which employed both qualitative and quantitative methods to fulfill the objectives of the research.

The investigator utilized resources from the Clothing and Textile Department Library, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara. Secondary data was also collected from books, dissertations, research papers, and several credible online databases.

The method of procedure followed to fulfill the stated objectives of the study are organized as follows:

3.1 Preliminary field visit

3.2 Research design

3.3 Need gap identification

3.3.1 Survey of the existing maternity wear

3.3.2 Selection of the sample

3.3.3 Preparation of tool

3.3.4 Tool validation

3.3.5 Permissions and ethical approvals

3.3.6 Data collection

3.3.5 Analysis of data

3.4 Design solutions and development of postpartum maternity wear

3.4.1 Create user persona

3.4.2 Conceptual design development

3.4.3 Finalize designs and specification sheet

3.4.3 Fabric selection and performance testing

3.4.5 Prototype development and cost estimation

3.5 Testing and Evaluation

- 3.5.1 Participant selection
- 3.5.2 Preparation of evaluation metrics
- 3.5.3 Conduct wear trial
- 3.5.4 Collection of feedback
- 3.5.5 Analysis of feedback
- 3.5.6 Interpretation of data
- 3.5.7 Recommendations for Future Study

3.1 Preliminary field visit

As part of the preliminary visits for the study the researcher conducted a site visit to healthcare hospitals run by charity trust, and government in Vadodara. The objective was to assess the existing provisions, if any, of maternity wear mothers of the new-born in the general ward. Initial casual discussions with hospital staff and patients further helped in understanding the challenges faced due to the lack of maternity wear. The insights gained from this visit contributed to identifying the need for maternity garments in public healthcare settings.

3.2 Research design

The research design involved a structured approach to identify the gaps in maternity wear provisions for public healthcare hospitals and to develop suitable solutions. A mixed-methods approach was employed, combining quantitative and qualitative data collection techniques such as surveys, interviews, and observations. The study was conducted in phases, including need-gap identification, design development, and testing and evaluation, to ensure comprehensive coverage of the subject. The applied research design for the given study is presented in flowchart (figure 3.1) delimiting the methodology in three phases (figure 3.1 a, b, c).

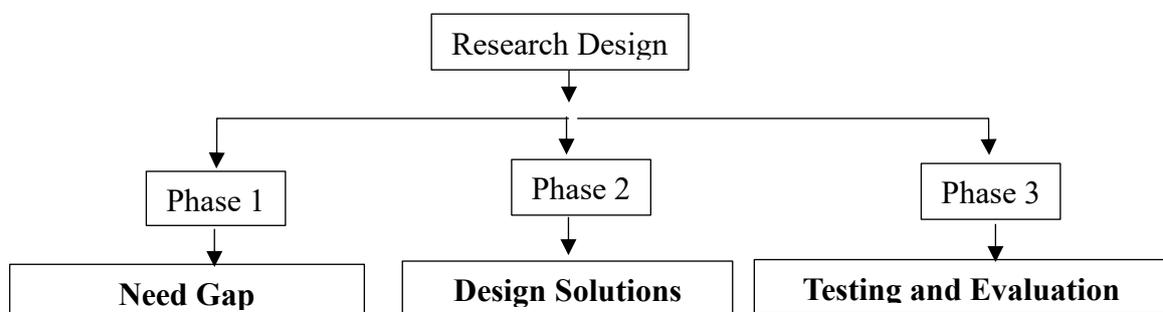


Figure 3.1: Research design flowchart showing three phases of applied research

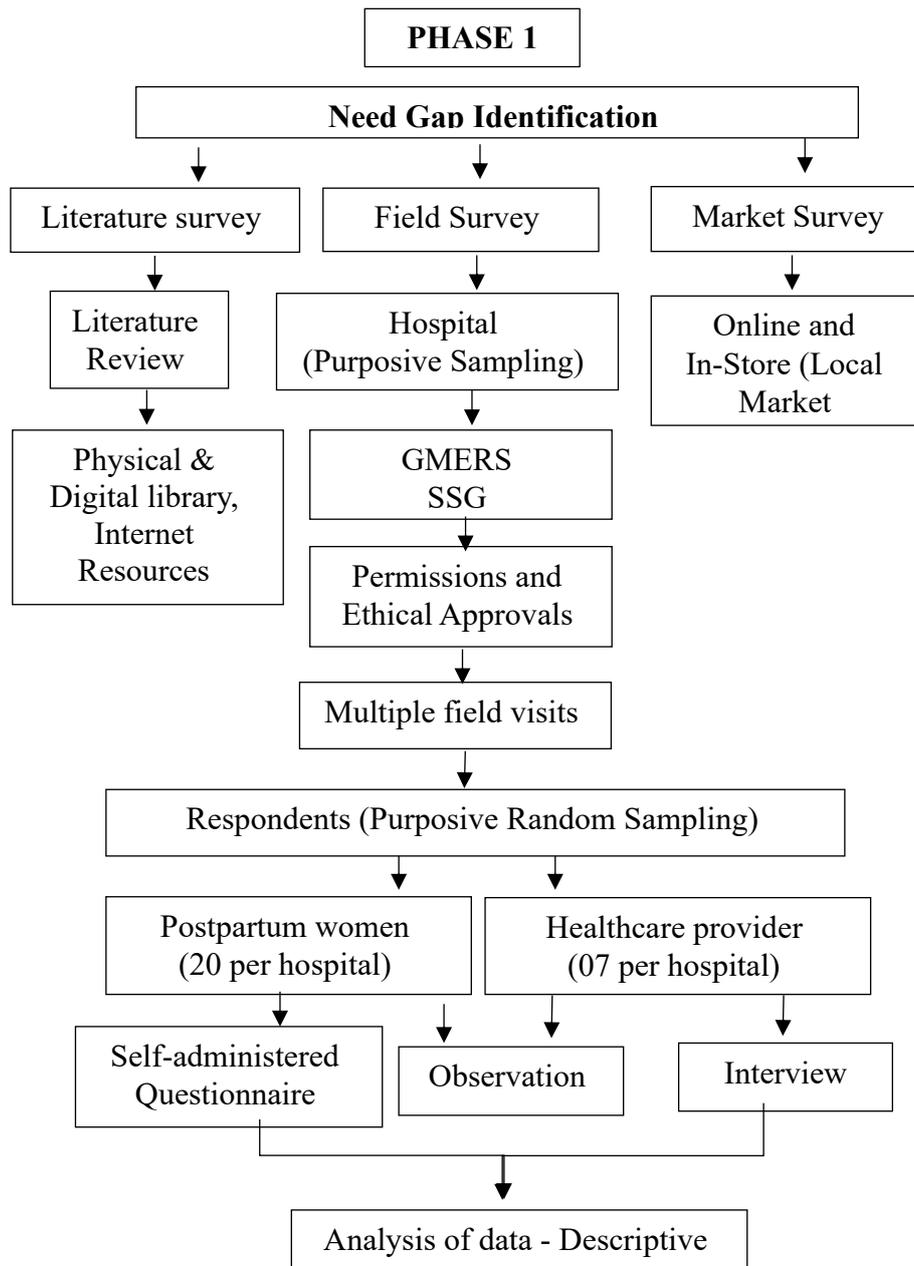


Figure 3.1a: Flow chart showing phase 1 of applied research design

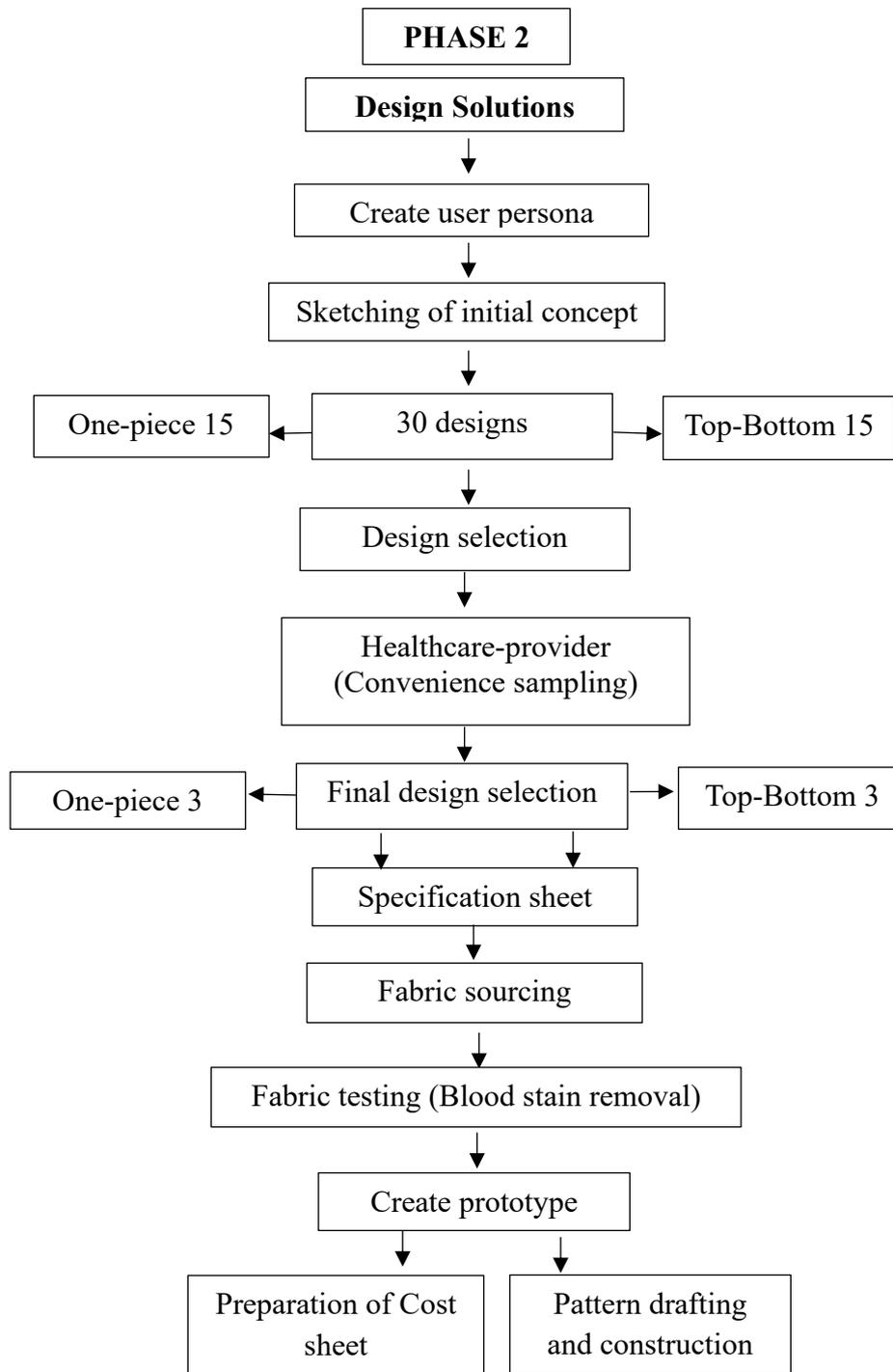


Figure 3.1b: Flow chart showing phase 2 of applied research design

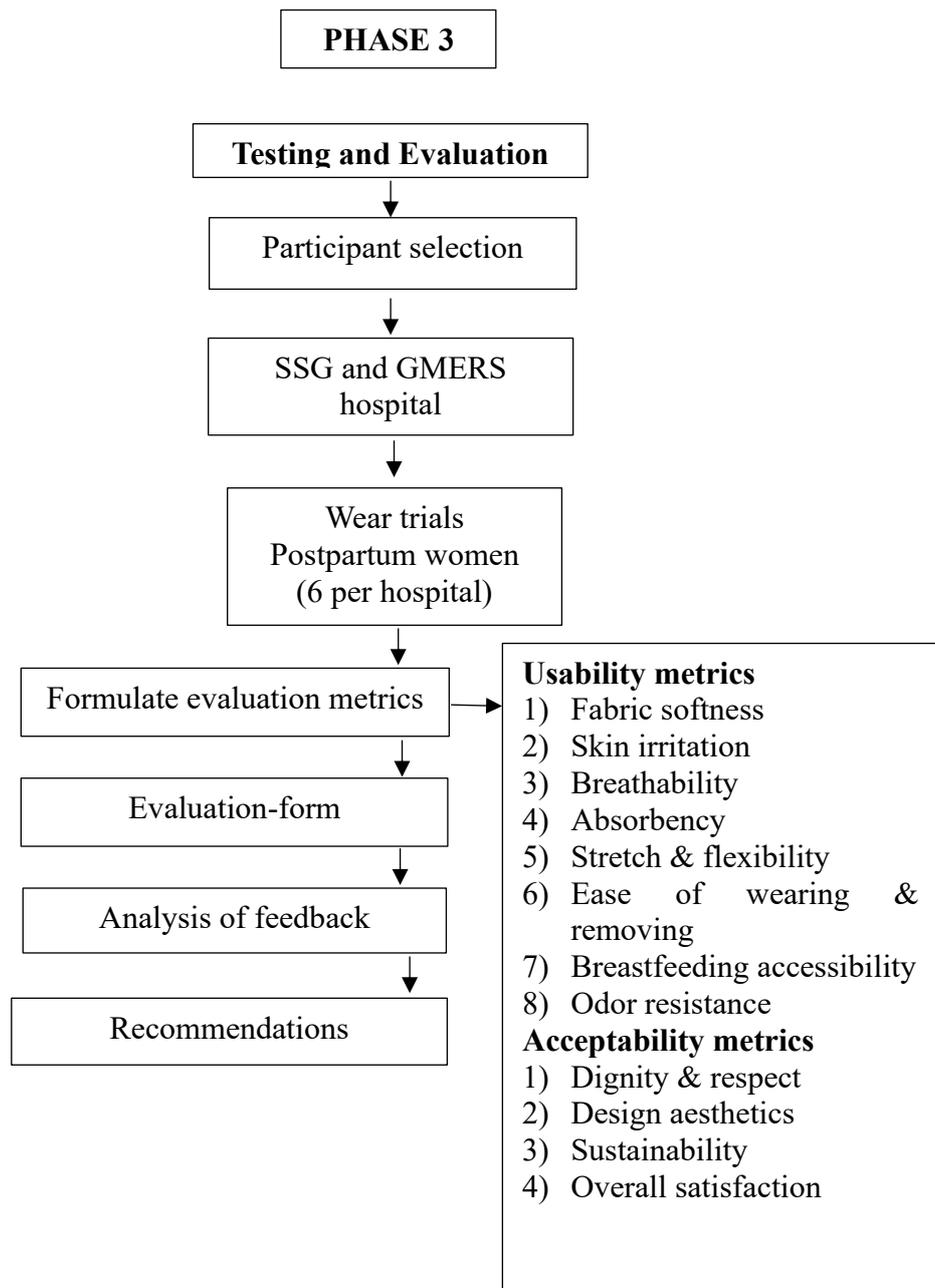


Figure 3.1c: Flow chart showing phase 3 of applied research design

3.2 Need Gap Identification

The objective of this phase is to understand the gaps in existing maternity wear in public hospitals and to identify the specific needs of postpartum women. This was achieved by gathering insights from postpartum women, healthcare providers, and maternity wear designers. Data collection included surveys, interviews, and observations, enabling the identification of design and functionality deficiencies in current maternity wear.

3.3.1 Survey of the existing maternity wear

A detailed survey was conducted to examine the styles, fabrics, and functionality of maternity wear currently provided in public healthcare hospitals. Data was gathered from postpartum women and healthcare providers to evaluate the design, usability, and suitability of these garments for postpartum care.

The hospitals selected for the study were:

- i. SSG Hospital, Vadodara
- ii. GMERS Hospital, Gotri, Vadodara

Postpartum women were surveyed to identify specific problems with the current maternity wear.

3.3.2 Selection of the sample

The study focused on two groups of participants: postpartum women and healthcare providers.

a) Postpartum women:

Selection Criteria:

- Recent experience with maternity wear in public hospitals (within the last six months)
- Aged 18 years or older
- Ability to provide informed consent

Sampling method: Purposive sampling was used to select 14 healthcare providers, including obstetricians, midwives, and nurses who specialize in postpartum care and 40 postpartum women who met these criteria based on the scope of the study and the need to gather in-depth insights. Sampling Method:

b) Healthcare providers:

Selection Criteria:

- Minimum of two years of experience in maternity care
- Currently employed in a public healthcare hospital
- Ability to provide informed consent

3.3.3 Preparation of tool

The data collection tools used in this study were designed to gather both quantitative and qualitative data. Fabric samples were shown to participants for evaluation based on texture, breath-ability, and softness. Annexure content included design features such as:

- 1) Silhouette type: A-line, empire waist, loose-fitting
- 2) Sleeve type: short, 3/4, long
- 3) Neckline type: round, V-neck, crossover
- 4) Fabric type: cotton, cotton polyester blend, polyester
- 5) Length type: full-length, mid-calf, knee
- 6) Colour and pattern: neutral tones, bright colors, solids, and patterns

a) Semi-structured questionnaire:

A structured questionnaire consisting of 40 questions was administered to postpartum women. 20 from each hospital. The questionnaire (Annexure 3) included both multiple-choice and open-ended questions, designed to gather data on:

- 1) Demographic information
- 2) Maternity wear experience of clothing provided by the PHC
- 3) Comfort and practicality
- 4) Design preferences
- 5) Fabric selection criteria
- 6) Additional design preferences
- 7) Open-ended questions

The questionnaire was pilot tested for clarity and reliability before being distributed.

b) Semi-structured interviews:

In-depth semi-structured interviews (Annexure 4) were conducted with 14 healthcare providers, seven from each hospital. The interviews focused on:

- 1) Demographic information
- 2) Clinical experience and observations
- 3) Effectiveness of current maternity wear
- 4) Ideal maternity wear characteristics
- 5) Impact on patient care and outcomes
- 6) Preferences regarding maternity wear features

An interview schedule was prepared with a set of guiding questions, while interviewees were encouraged to express their opinions freely.

c) Observation:

An observational study was conducted to assess the use and comfort of existing maternity wear in a hospital setting. Observations were made regarding: The fit and comfort of the

garments worn by postpartum women. Practical challenges such as ease of dressing, accessibility of medical staff, and hygiene issues

3.3.4 Tool validation

The questionnaire and interview schedule were validated for its content to ensure they effectively addressed the research objectives. The tools were reviewed by experts in the following fields:

Table 3.1: Expert panel for tool validation

Expert type	Name and designation	Institution/clinic	Role in research
Academician	Dr. Kruti Dholakia, Associate Professor	NIFT, Gandhinagar	Ensured design-related aspects of maternity wear were captured.
Gynaecologist	Dr. Pratibha, MBBS General Physician, Gynac Specialist	Pratibha Clinic, Nani Daman	Validated the relevance of medical and postpartum care questions.
Statistician	Ms. Shreya Mathur, Temporary Teaching Assistant	Department of Statistics, MSU Baroda, Vadodara	Ensured the questions were structured for reliable data analysis.

After receiving expert feedback, the tools were revised, and a pilot test was conducted with a small sample of participants to further refine them before full-scale data collection.

3.3.5 Permissions and ethical approvals

To ensure compliance with ethical guidelines and institutional regulations, the researcher obtained formal permissions before conducting the study at GMERS hospital and SSG hospital.

At GMERS hospital, the approval process began when the researcher submitted a formal research request to Dr. Anup Chandani, the Superintendent. Dr. Anup Chandani then directed the researcher to Dr. Sandeep Joshi, the Head of the Psychology Department and Secretary of the Ethics Committee, for further guidance. Dr. Joshi provided detailed information on the necessary documentation and referred the researcher to Mr. Mayur Bhai, who assisted in understanding the paperwork requirements. After gathering the required documents, the researcher submitted the ethical approval form to Mr. Mayur Bhai and the Ethics Committee. The research proposal (Annexure-1) was reviewed in an Ethics Committee meeting, and upon approval, the researcher received formal permission (Annexure-2) to conduct the study. Additionally, Dr. Ashish Shah, the Head

of the Gynaecology Department, assigned Dr. Neha Makavana, a gynaecologist, as the departmental guide to facilitate the research process. To ensure comprehensive coverage of the subject, the stepwise approval process for research at GMERS Hospital was illustrated in (Figure 3.2a)

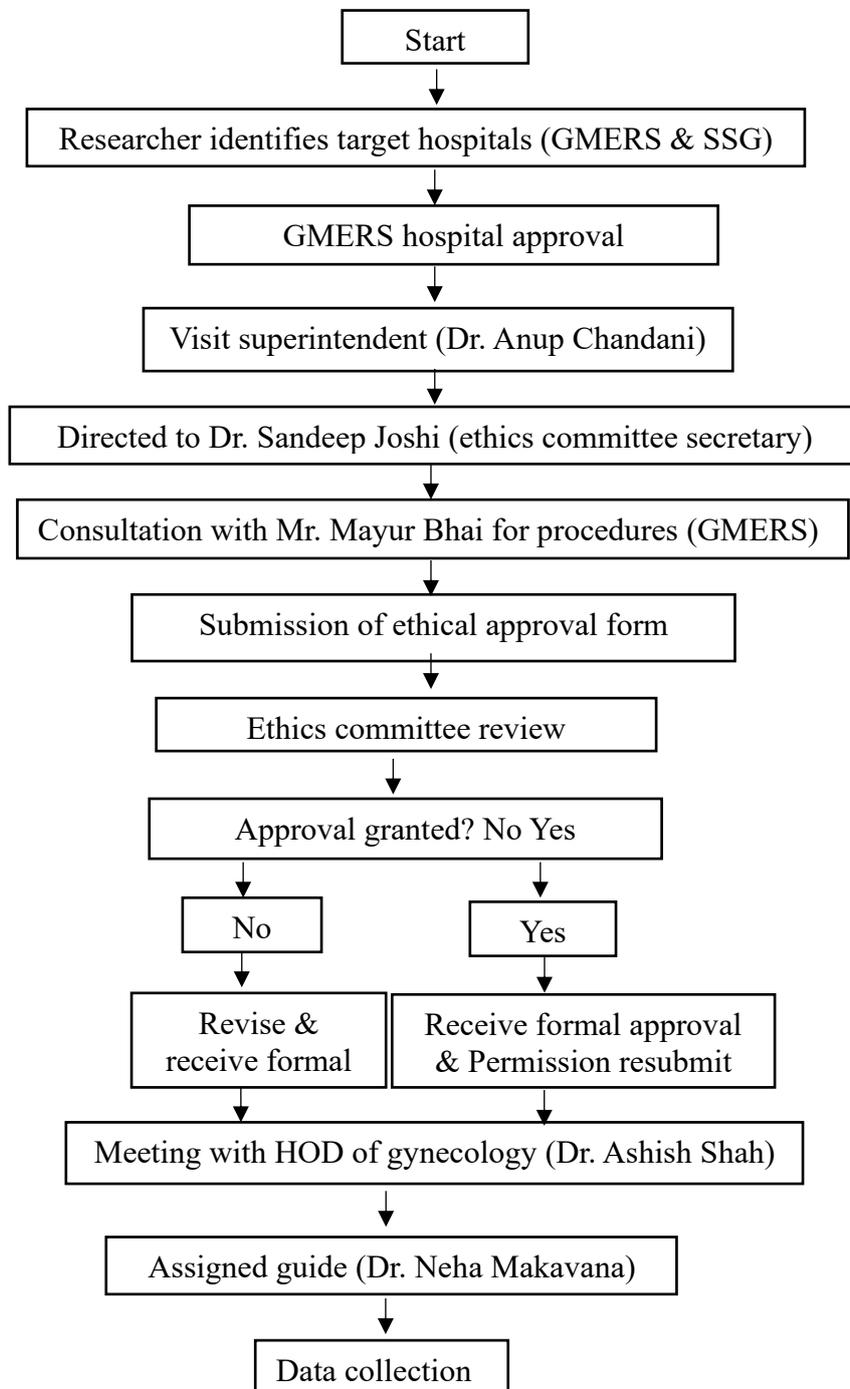


Figure 3.2a: Stepwise approval process for research at GMERS hospital

At SSG Hospital, the researcher followed a structured institutional protocol to obtain research permission. A formal permission letter (Appendix-2) was submitted to the

Superintendent's office, where Mr. Raju Verma, the Personal Assistant to the Superintendent, provided guidance on the approval process. After reviewing the request, the Superintendent approved and signed the permission letter (Annexure-3). The researcher was then assigned to the Gynaecology Department, where a meeting was held with the Head of the Department, Dr. Ashish Shah. Following discussions regarding the study details, the HOD granted formal permission for data collection in the department. To ensure comprehensive coverage of the subject, the stepwise approval process for research at SSG Hospital was illustrated in Figure 3.2b.

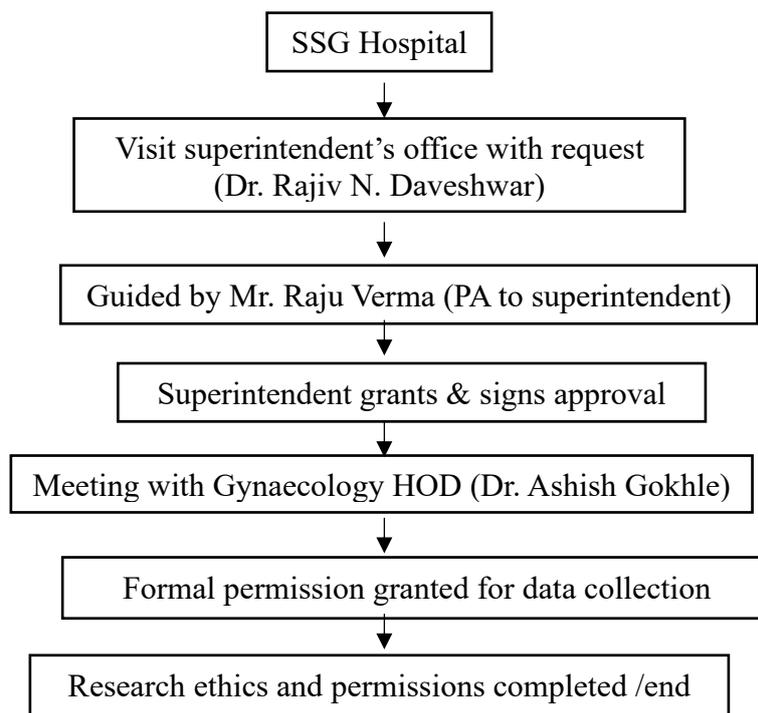


Figure 3.2b: Stepwise approval process for research at SSG hospital

By adhering to these institutional procedures, the researcher ensured compliance with ethical standards and hospital regulations while maintaining participant confidentiality and informed consent protocols.

3.3.6 Data collection

Surveys and interviews were conducted in selected hospitals with pre-tested tools. Observational studies were carried out during hospital visits to assess real-time use and challenges of current maternity wear.

3.3.7 Analysis of data

The collected data was analysed using frequency and percentage distribution to identify Need and preferences among postpartum women in public healthcare hospitals. Each response was categorized, and the occurrence of different variables was calculated in terms of frequency counts and percentages. Qualitative analysis was conducted for open-ended responses to identify common themes related to comfort, functionality, aesthetic and hygiene concerns.

3.3.6 Market survey

The market survey was conducted through observational research to document the availability, pricing, and fabric choices of postpartum wear in Vadodara. The survey covered brand stores such as Mothercare, Max Fashion, and Lifestyle, as well as local markets including Mangal Bazaar, Store near SSG Hospital, Jubilee Baug Garden, and Nava Bazaar. Various postpartum garments, including nightgowns, nursing tops, leggings, and compression wear, were observed in terms of fabric composition (cotton, polyester blends, nylon) and price range. The study relied solely on visual assessment and market observation without direct interaction with shopkeepers or customers.

3.4 Design solutions and development of postpartum maternity wear

In this phase, the maternity gown designs were created with a focus on the specific needs of postpartum women, including comfort, accessibility for breastfeeding, ease of movement, and aesthetic appeal. A total of 30 designs were developed-15 one-piece gowns and 15 top-bottom sets. These designs aimed to provide postpartum women with functional yet stylish options while ensuring dignity and practicality during their recovery period. The process considered not only the wearer's comfort but also the garment's ability to facilitate breastfeeding and medical care.

3.4.1 Create user persona

User personas were created based on the survey and interview data, representing different categories of postpartum women (e.g., first-time mothers, women with C-sections, women with other medical conditions). Each persona reflected distinct needs, preferences, and challenges related to maternity wear.

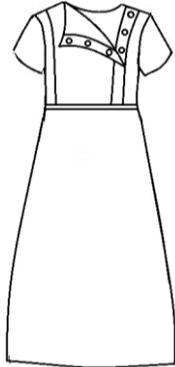
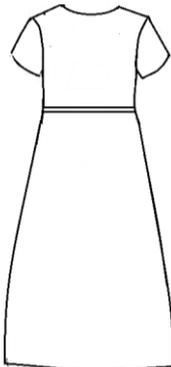
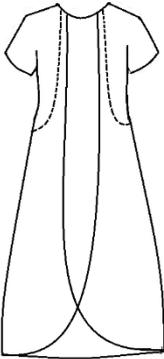
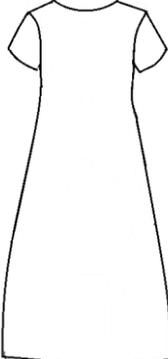
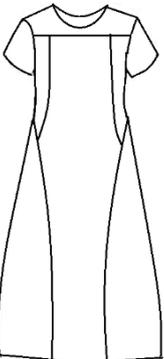
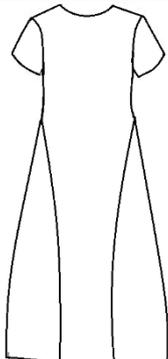
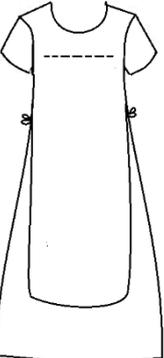
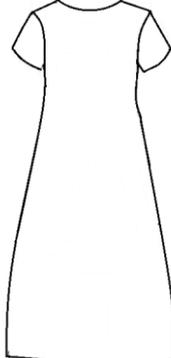
Table 3.2: User persona

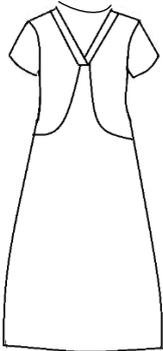
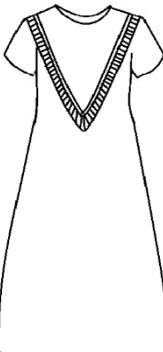
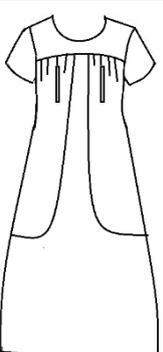
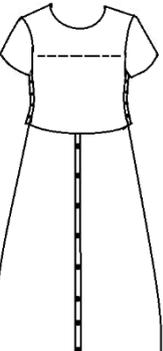
Demographic details	Insights
Age	
Hospital	
Socioeconomic background	
Education level	
Marital status and cultural background	
Medical and maternity profile	
Delivery type	
Hospital stay duration	
Common health concerns	
Breastfeeding challenges	
Clothing and comfort preferences	
Preferred attire	
Laundry and hygiene challenges	
Current hospital clothing situation	
Emotional and psychological factors	
Privacy concerns	
Emotional state	
Support system	
Design considerations for maternity wear	
Fabric	
Maintenance	
Modesty and functionality	
Budget	
Breastfeeding accessibility	
Fit and adjustability	
Neckline	
Sleeve design	

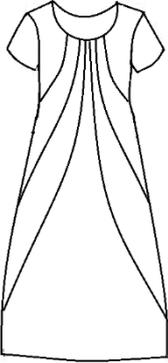
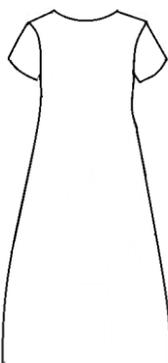
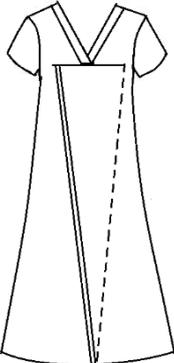
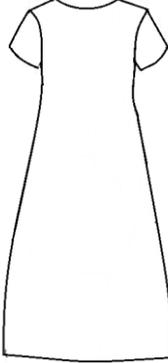
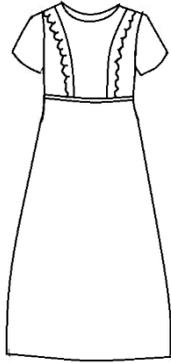
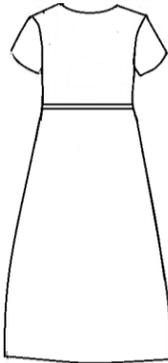
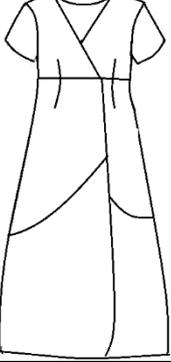
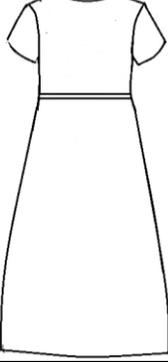
3.4.2 Conceptual design development

The maternity gown designs were created to meet the specific needs of postpartum women, focusing on comfort, breastfeeding accessibility, ease of movement, and style. A total of 30 designs were developed—15 one-piece gowns and 15 top-bottom sets—based on insights from surveys, interviews, and user personas. These designs balance functionality and aesthetics, ensuring suitability for hospital settings while supporting recovery, medical care, and emotional well-being. All sketches were created by the researcher using Paint on Windows 11 and are shown below.

Table 3.3a: One-Piece maternity designs

		<p>One-piece - 1</p> <p>Description: This A-line dress features short sleeves, a double-sided button closure, and a fitted bodice with an empire waist. It has pinafore-style straps, an A-line skirt, and a simple back for a clean look.</p>
<p>One-piece – 1 Front</p>	 <p>One-piece – 1 Back</p>	
		<p>One-piece - 2</p> <p>Description: This A-line dress features short sleeves and a two-layer overlapping back panel, creating a soft, flowy effect. The front is simple with curved side openings for ease of movement. The back is plain above the overlap, maintaining a clean and minimal look.</p>
<p>One-piece – 2 Front</p>	 <p>One-piece – 2 Back</p>	
		<p>One-piece - 3</p> <p>Description: This A-line nursing dress features short sleeves, an upper princess-line opening, and godet panels for added flare. The back is plain with godets, ensuring comfort and elegance.</p>
<p>One-piece – 3 Front</p>	 <p>One-piece – 3 Back</p>	
		<p>One-piece - 4</p> <p>Description: This A-line nursing dress features short sleeves and a horizontal front opening for nursing access. A layered apron-style panel adds coverage and style, while side tie-ups allow for adjustability. The A-line skirt ensures comfort and ease of movement, with a plain back for a clean look.</p>
<p>One-piece – 4 Front</p>	 <p>One-piece – 4 Back</p>	

		<p>One-piece - 5</p> <p>Description: This A-line nursing dress features short sleeves, a deep V-neck with an overlapping front panel for nursing access, and an empire waistline. The A-line skirt ensures comfort, with a plain back for a clean look.</p>
One-piece – 5 Front	One-piece – 5 Back	
		<p>One-piece - 6</p> <p>Description: This A-line nursing dress features short sleeves, a deep V-neck with gathered detailing, and a concealed zipper for nursing access. The A-line skirt ensures comfort, while the plain back maintains a clean and elegant look.</p>
One-piece – 6 Front	One-piece – 6 Back	
		<p>One-piece - 7</p> <p>Description: This A-line nursing dress features short sleeves, a yoke with gathered detailing, and welt openings with overlapping fabric for nursing access. The A-line skirt ensures comfort, while the plain back maintains a clean and elegant look.</p>
One-piece – 7 Front	One-piece – 7 Back	
		<p>One-piece - 8</p> <p>Description: This A-line nursing dress features short sleeves, a horizontal zipper on the bodice for nursing access, and side openings with magnetic closures for ease. A centre front button placket extends through the A-line skirt, adding functionality and style. The plain back ensures a clean and elegant look.</p>
One-piece – 8 Front	One-piece – 8 Back	

		<p>One-piece - 9</p> <p>Description: This A-line nursing dress features short sleeves, a round neckline, and pleated detailing on the bodice for a structured look. The curved panel design on the front adds elegance and flow. The nursing access is integrated discreetly within the pleats or side openings. The back is plain</p>
<p>One-piece – 9 Front</p>	 <p>One-piece – 9 Back</p>	
		<p>One-piece - 10</p> <p>Description: This nursing dress features a V-neckline with a layered panel design for stylish coverage. The asymmetrical front opening with an overlapping flap allows for discreet nursing access. It has short sleeves and an A-line silhouette, providing comfort and ease of movement. The back is plain.</p>
<p>One-piece – 10 Front</p>	 <p>One-piece – 10 Back</p>	
		<p>One-piece - 11</p> <p>Description: This nursing dress features vertical princess seams with ruffle detailing, concealing the nursing openings. A defined waist seam enhances the silhouette, while the A-line skirt ensures comfort. The back is plain for a simple yet elegant look.</p>
<p>One-piece – 11 Front</p>	 <p>One-piece – 11 Back</p>	
		<p>One-piece - 12</p> <p>Description: This wrap-style nursing dress features an overlapping front panel for easy access. The design includes side gathers and curved seam detailing for a stylish look. The back remains simple with a flowing silhouette for comfort.</p>
<p>One-piece – 12 Front</p>	 <p>One-piece – 12 Back</p>	

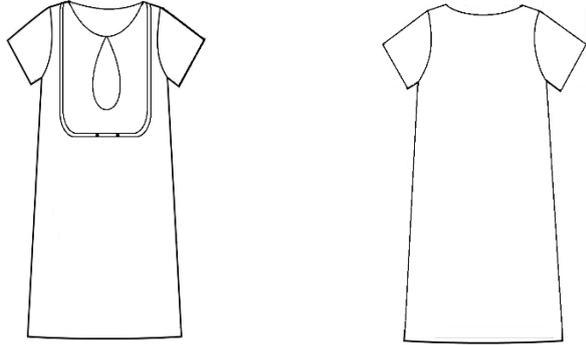
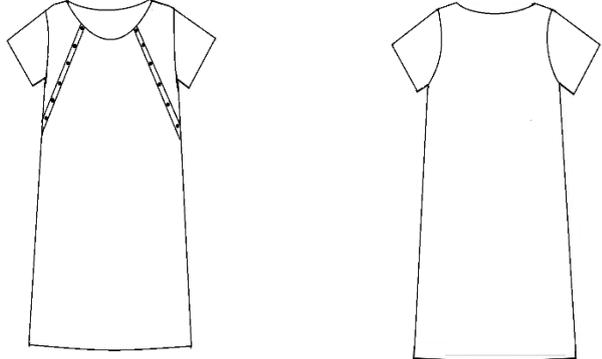
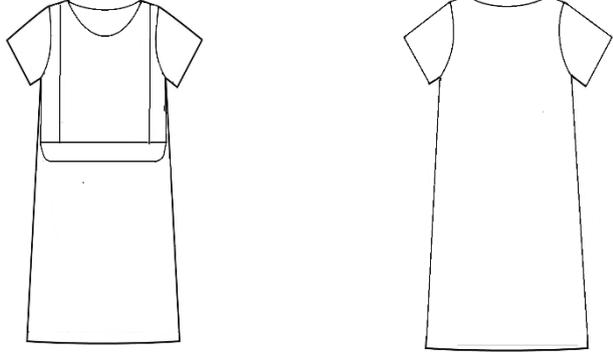
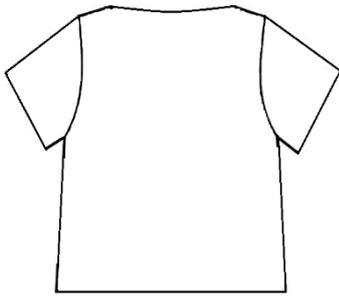
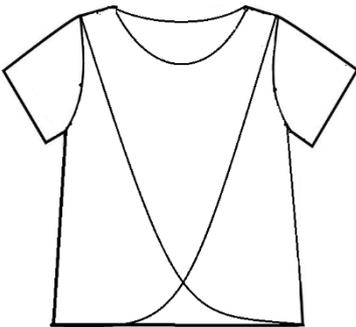
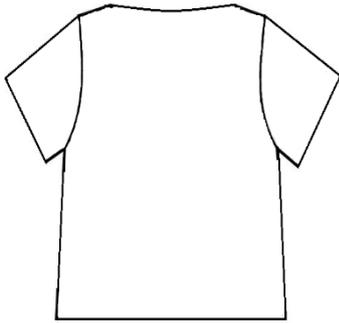
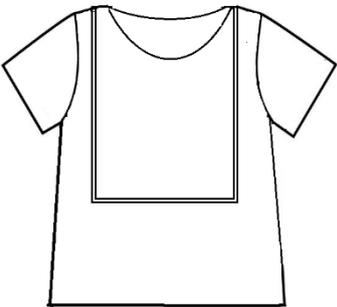
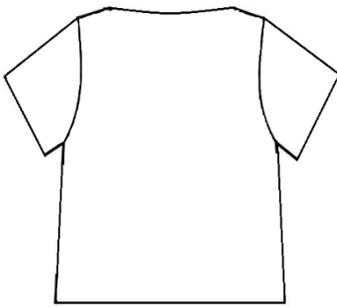
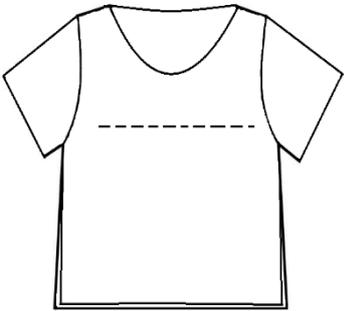
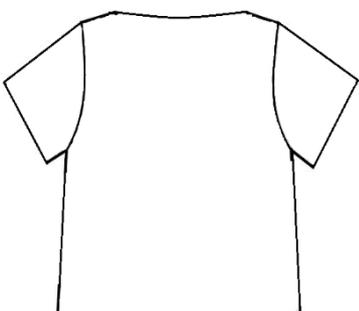
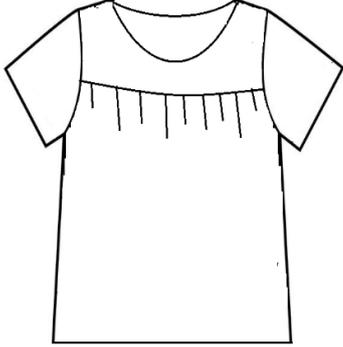
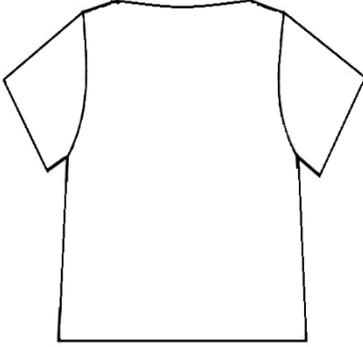
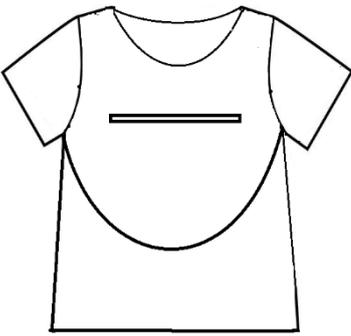
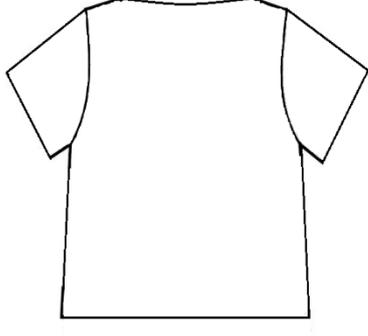
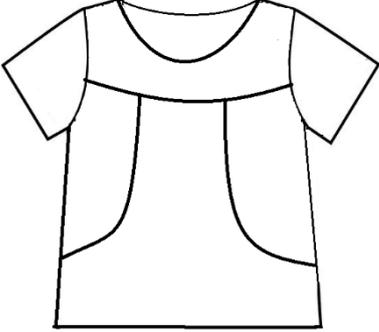
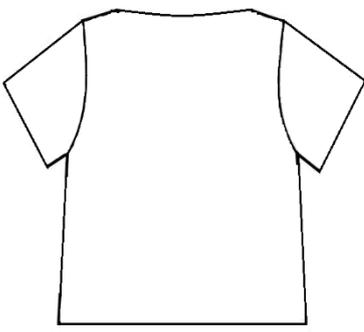
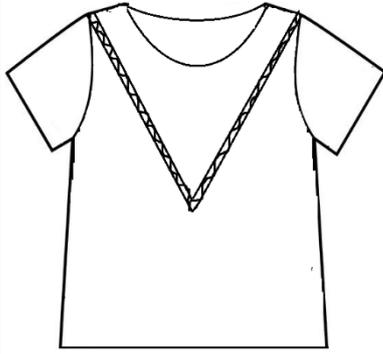
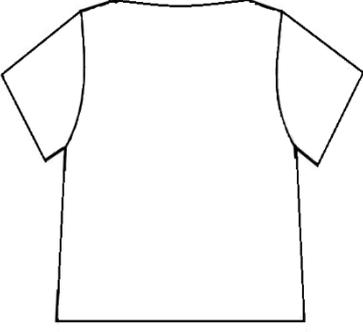
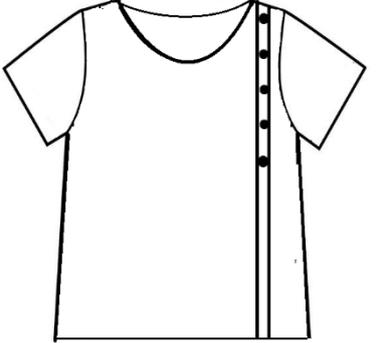
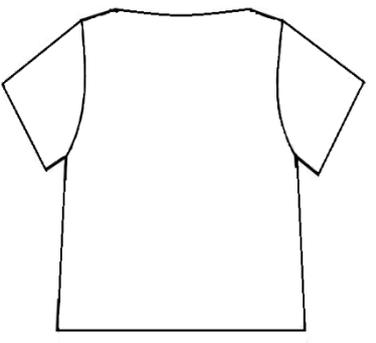
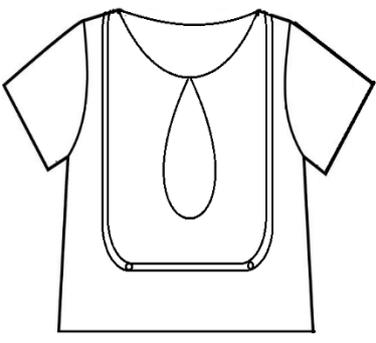
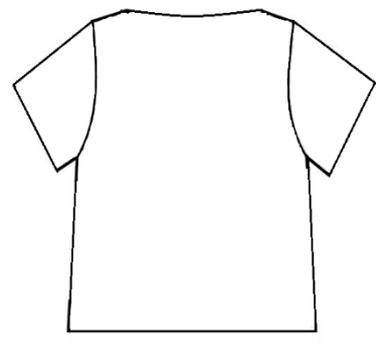
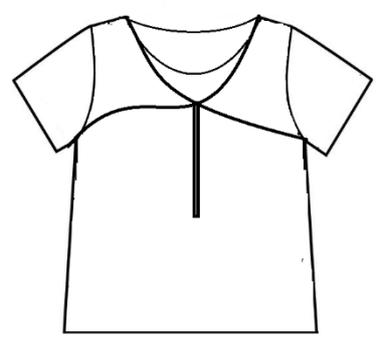
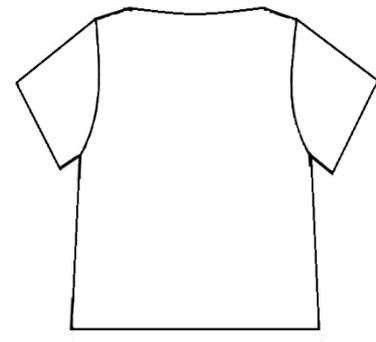
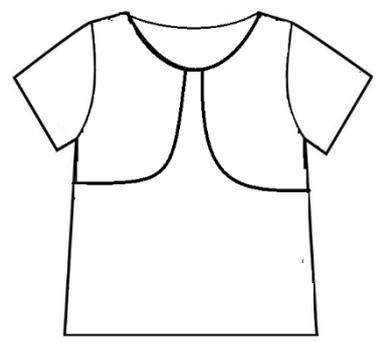
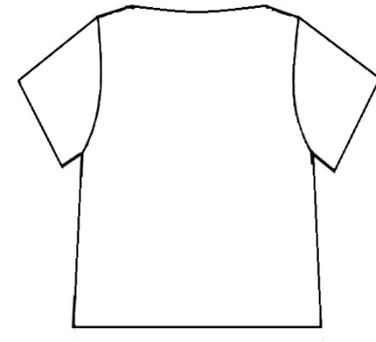
		<p>One-piece - 13</p> <p>Description: This dress features a teardrop-shaped opening on the front, secured with two buttons for easy nursing access. The design adds a stylish yet functional element to the garment. The back is kept simple for comfort and ease of wear.</p>
One-piece – 13 Front	One-piece – 13 Back	
		<p>One-piece - 14</p> <p>Description: This dress has diagonal openings on both sides, secured with four buttons for nursing access. The design ensures convenience while maintaining a stylish appearance. The back remains plain for comfort and ease of wear.</p>
One-piece – 14 Front	One-piece – 14 Back	
		<p>One-piece - 15</p> <p>Description: This dress features a horizontal opening across the bust for nursing access. The top layer overlaps for coverage while ensuring ease of use. The back remains simple for comfort and practicality.</p>
One-piece – 15 Front	One-piece – 15 Back	

Table 3.3b: Top maternity wear designs

		<p>Top- 1</p> <p>Description: This top feature a side-opening design with buttons for nursing access. The front panel overlaps to provide coverage while allowing easy access for breastfeeding. The back remains simple and slightly extended for added comfort and practicality.</p>
Top – 1 Front		
		<p>Top- 2</p> <p>Description: This top feature a wrap-style front opening for nursing access. The overlapping layers can be pulled aside for easy breastfeeding while maintaining coverage. The back remains simple for comfort and practicality.</p>
Top – 2 Front		
		<p>Top- 3</p> <p>Description: This top feature a hidden vertical zipper beneath the front panel for discreet nursing access. The top layer lifts for easy breastfeeding, while the back remains simple for comfort.</p>
Top – 4 Front		
		<p>Top- 4</p> <p>Description: This top feature a horizontal concealed zipper across the bust for nursing access. The discreet opening allows for easy breastfeeding while maintaining a simple and stylish look. The back remains plain for comfort and practicality.</p>
One-piece – 4 Front		
		<p>One-piece – 4 Back</p>

		<p>Top- 5</p>
<p>Top – 5 Front</p>	<p>Top – 5 Back</p>	<p>Description: This top feature a hidden nursing access concealed beneath the pleated yoke. The top layer lifts up for easy breastfeeding while maintaining a modest and stylish look. The back remains simple for comfort and practicality.</p>
		<p>Top- 6</p>
<p>Top – 6 Front</p>	<p>Top – 6 Back</p>	<p>Description: This top feature a horizontal welt across the bust for nursing access. The curved overlay provides coverage while ensuring ease of use. The back remains simple for comfort and practicality.</p>
		<p>Top- 7</p>
<p>Top – 7 Front</p>	<p>Top – 7 Back</p>	<p>Description: This top feature side-access nursing openings hidden beneath the layered front panels. The design ensures discreet breastfeeding while maintaining a stylish and functional look. The back remains simple for comfort.</p>
		<p>Top- 8</p>
<p>One-piece – 8 Front</p>	<p>One-piece – 8 Back</p>	<p>Description: This top feature a V-shaped concealed zipper along the neckline for nursing access. The zipper provides a stylish design element while ensuring ease of breastfeeding. The back remains simple for comfort and practicality.</p>

		<p>Top- 9</p>
<p>Top – 9 Front Top – 9 Back</p>		<p>Description: This top feature a horizontal concealed zipper across the bust for nursing access. The curved overlay provides coverage while ensuring ease of use. The back remains simple for comfort and practicality.</p>
		<p>Top- 10</p>
<p>Top – 10 Front Top – 10 Back</p>		<p>Description: This top feature a teardrop-shaped nursing access beneath a secured front panel with snap buttons or zippers at the bottom corners. The top layer lifts up, allowing discreet breastfeeding access while maintaining coverage.</p>
		<p>Top- 11</p>
<p>Top – 11 Front Top – 11 Back</p>		<p>Description: The top features a hidden vertical zipper beneath an asymmetrical front panel, offering easy and discreet nursing access. The stylish yoke detail adds a modern touch while maintaining coverage.</p>
		<p>Top- 12</p>
<p>One-piece – 12 Front One-piece – 12 Back</p>		<p>Description: The top incorporates a dual-layer design with curved openings for breastfeeding access. The overlapping panels ensure modesty and convenience, blending functionality with a contemporary look.</p>

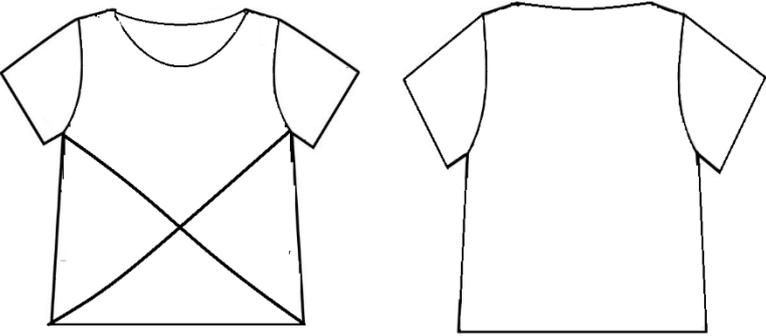
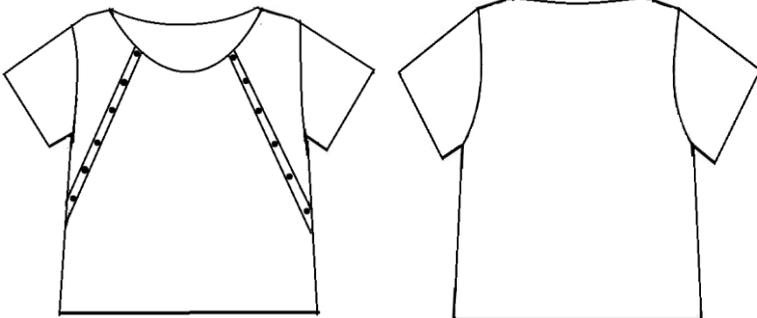
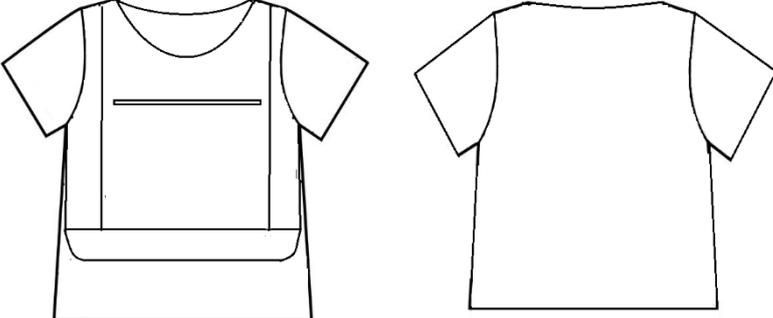
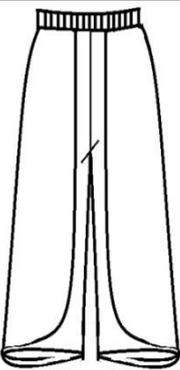
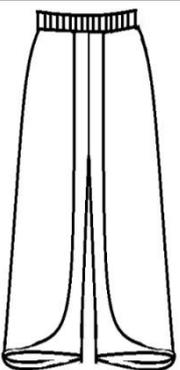
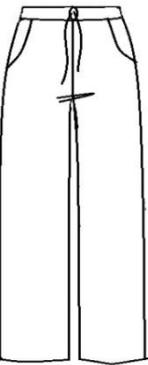
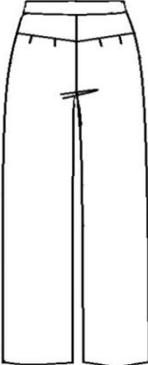
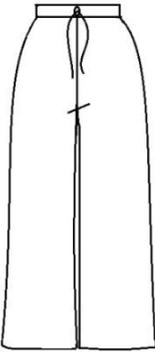
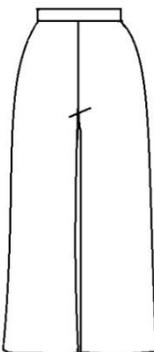
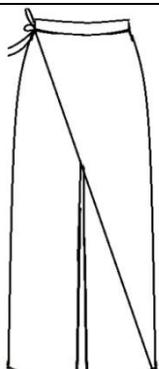
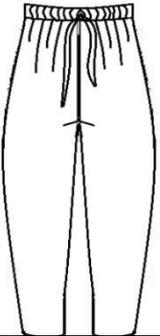
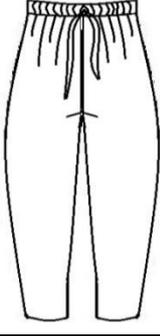
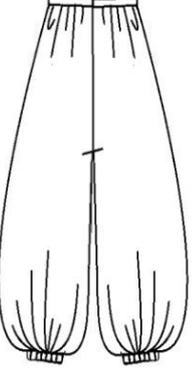
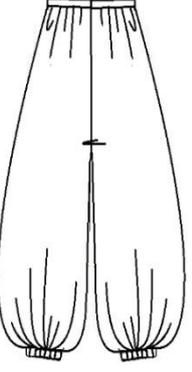
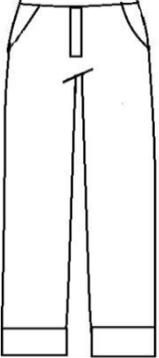
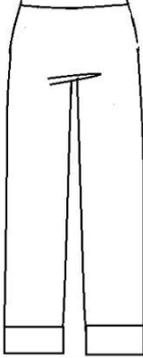
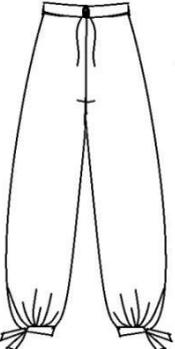
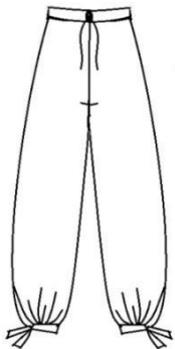
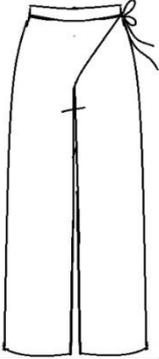
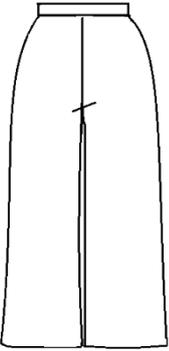
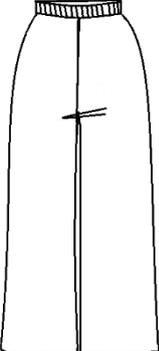
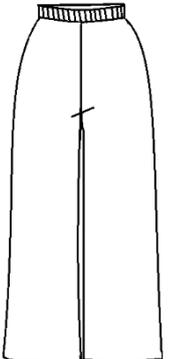
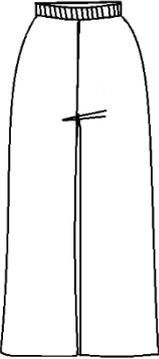
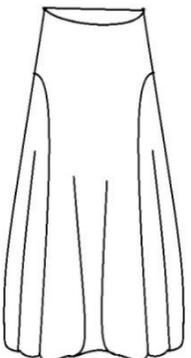
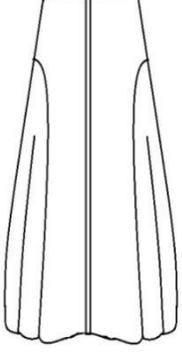
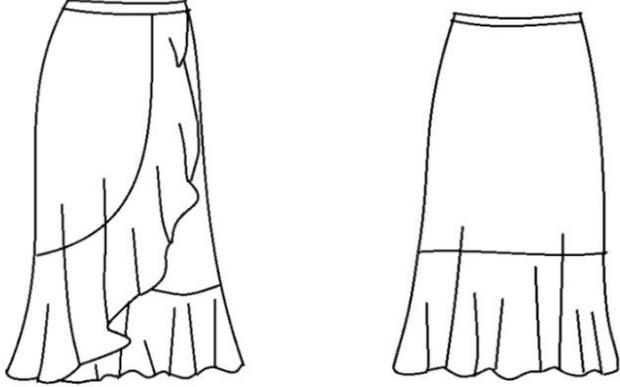
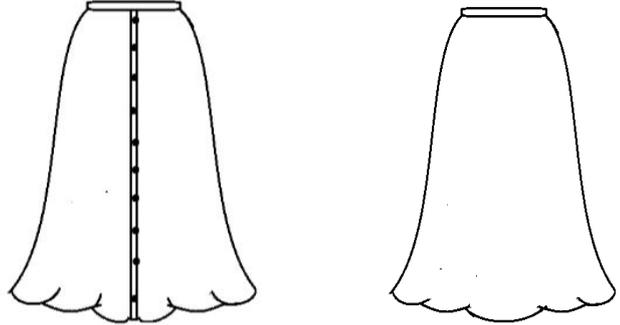
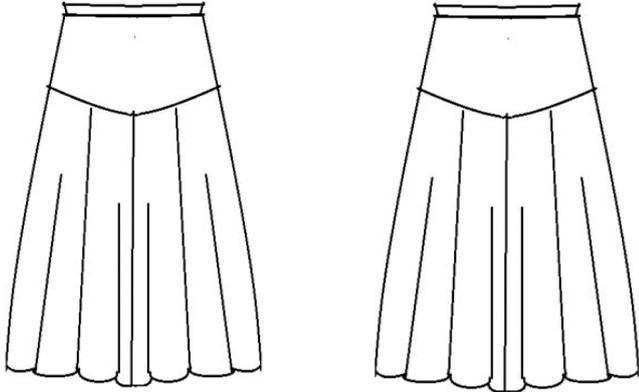
		<p>Top- 13</p> <p>Description: This top feature a crossover front panel that provides easy nursing access. The overlapping layers ensure coverage while maintaining a stylish and functional look. The back remains simple for comfort.</p>
Top – 13 Front	Top – 13 Back	
		<p>Top- 14</p> <p>Description: This top feature diagonal buttoned openings along the front panel for easy and discreet nursing access. The back remains plain, ensuring a clean, minimal, and comfortable design.</p>
Top – 14 Front	Top – 14 Back	
		<p>Top- 15</p> <p>Description: This top feature a horizontal welt opening hidden beneath a flap panel for discreet nursing access. The back remains plain for a clean and comfortable design.</p>
Top – 15 Front	Top – 15 Back	

Table 3.3c: Bottom maternity wear designs

				<p>Bottom - 1</p> <p>Description: This bottom features an elasticated waistband for comfort and flexibility. A front overlap panel adds a stylish and airy effect. The wide-leg silhouette enhances ease of movement and breathability.</p>
Bottom – 1 Front		Bottom – 1 Back		
				<p>Bottom - 2</p> <p>Description: This bottom has a straight-leg fit with a front tie closure for adjustability. Side pockets add functionality and convenience. The minimal design ensures a versatile and comfortable wear.</p>
Bottom – 2 Front		Bottom – 2 Back		
				<p>Bottom - 3</p> <p>Description: This bottom features a fitted waistband with an adjustable front tie for a secure fit. The straight, flowing silhouette provides comfort and ease of movement. The minimalistic design makes them versatile for both casual and formal wear.</p>
Bottom – 3 Front		Bottom – 3 Back		
				<p>Bottom 4</p> <p>Description: This bottom features a wrap-over front panel secured with a side tie, creating an elegant and flowy look. The waistband is fitted for structure, while the wide-leg silhouette allows for ease of movement and breathability. This design offers both comfort and style, making it a versatile wardrobe piece.</p>
Bottom – 4 Front		Bottom – 4 Back		

		<p>Bottom - 5</p>
<p>Bottom – 5 Front</p>	<p>Bottom – 5 Back</p>	<p>Description: This jogger-style bottom features an elasticated waistband with a drawstring for an adjustable fit. The tapered leg design ensures a relaxed yet stylish silhouette. The gathered ankle detail adds a sporty touch, making them ideal for casual and active wear.</p>
		<p>Bottom - 6</p>
<p>Bottom – 6 Front</p>	<p>Bottom – 6 Back</p>	<p>Description: This voluminous bottom features an elasticated waistband for comfort and a secure fit. The gathered ankle cuffs create a structured yet flowy silhouette. With an identical front and back design, they offer a relaxed and stylish look, perfect for casual or ethnic wear.</p>
		<p>Bottom -7</p>
<p>Bottom – 7 Front</p>	<p>Bottom – 7 Back</p>	<p>Description: This straight-leg trousers feature a structured waistband with a fly front for a tailored look. Slanted side pockets add functionality and style. The cuffed hem enhances the polished and modern appeal, making them suitable for both casual and formal wear.</p>
		<p>Bottom - 8</p>
<p>Bottom – 8 Front</p>	<p>Bottom – 8 Back</p>	<p>Description: This relaxed-fit bottom feature an elasticated waistband with a drawstring for a customizable fit. The tapered legs gather at the ankle with adjustable tie-up details, adding a stylish touch. The design ensures both comfort and a chic, sporty appeal, perfect for casual wear.</p>

				<p>Bottom - 9</p> <p>Description: This wrap-style palazzo pants feature a side tie-up closure, offering an adjustable fit. The flowy silhouette provides comfort and ease of movement. The back mirrors the front design, maintaining a seamless and elegant look.</p>
One-piece – 9 Front		One-piece – 9 Back		
				<p>Bottom -10</p> <p>Description: This wide-leg pant features a plain front waistband with a back waistband is elasticated, ensuring comfort and flexibility. The clean silhouette and hem detailing add a touch of elegance to the design.</p>
One-piece – 10 Front		One-piece – 10 Back		
				<p>Bottom -11</p> <p>This wide-leg pant features an elasticated waistband on both sides, ensuring a comfortable and flexible fit. The flowy silhouette provides ease of movement, making them perfect for casual and relaxed wear.</p>
One-piece – 11 Front		One-piece – 11 Back		
				<p>Bottom - 12</p> <p>Description: This godet skirt features a high waistband and paneled construction with flared godets for added volume and movement. hemline, creating a flattering silhouette.</p>
One-piece – 12 Front		One-piece – 12 Back		

		<p>One-piece - 13</p> <p>Description: This asymmetrical ruffle skirt features a fitted waistband and a layered cascading ruffle that flows diagonally across the front. The flared hem adds movement and a feminine touch. Perfect for an elegant yet playful look.</p>
One-piece – 13 Front	One-piece – 13 Back	
		<p>One-piece - 14</p> <p>Description: This button-down flared skirt with a front placket closure running down the centre. The slightly wavy hemline adds a soft, feminine touch, enhancing the flow of the silhouette.</p>
Bottom – 14 Front	Bottom – 14 Back	
		<p>One-piece - 15</p> <p>Description: This panel skirt features a fitted yoke waistline that enhances the silhouette before flaring into structured panels for a voluminous effect.</p>
Bottom – 15 Front	Bottom – 15 Back	

3.4.3 Finalize designs and specification sheet

Following the fabric selection and testing phase, all 30 sketches were reviewed to finalize the best designs for construction. A design preference schedule was prepared to assess design variations.

- i. **Finalize designs** -The final selection of designs was made by the researcher and research guide, considering factors like design feasibility, budget constraints, and

cost-effectiveness. A total of six designs were chosen for further development and construction:

- 3 One-piece garments
- 3 Top-bottom sets

ii. **Specification sheet development-** The finalized maternity wear designs were documented in a detailed specification sheet outlining critical garment elements. These specifications ensured the garments were tailored for comfort, functionality, and practicality for postpartum women in hospital and home environments

Table 3.4: Specification sheet

Garment Specification sheet			Technical sketch	
Date				
Style				
Hospital				
Description				
			Front	Back
Use				
User				
Environment				
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1			Fabric 1	
Design Features				
Length	Pocket	Fasteners	Waistband	
Garment measurement				
Measurement			Value (in)	
Chest (Bust)				
Waist				
Hip				
Shoulder Width				
Armhole Depth				
Neck Width				
Front Neck Depth				
Back Neck Depth				
Full Length (One-Piece Gown)				
Full Length (Top)				

3.4.3 Fabric selection and performance testing

To ensure that the selected materials met hospital and postpartum care requirements, fabric testing was conducted. The following fabrics were analysed for their absorption capacity, stain resistance, durability, and comfort:

- Cotton – Highly absorbent, commonly used in medical wear.
- Polyester – Less absorbent but durable.
- Poly-Cotton Blend – A mix of both, offering moderate absorption and strength.
- Khadi Cotton – Handwoven fabric, known for breathability and stain release.

i. Blood absorption and stain testing

- a) Fabric samples (2x2 inches) were cut for uniform testing.
- b) Real human blood (13mL per batch) was applied to each sample.
- c) The absorption rate and stain spread were observed for 30 minutes before cleaning.
- d) Stain intensity was recorded using a 0-5 stain scale before washing.

ii. Cleaning methods tested

Each fabric underwent multiple cleaning methods to assess stain removal efficiency:

- a) Water only (Control) – To check natural stain release.
- b) Mild detergent – Common hospital cleaning method.
- c) Hydrogen peroxide (H₂O₂) – Medical stain remover.
- d) Enzyme-based cleaner – Designed for protein stain breakdown.
- e) Bleach treatment – Effective but tested for fabric damage risks.

iii. Stain removal assessment

After washing, stain intensity was re-evaluated using the 0-5 scale:

Table 3.5 Stain intensity scale

0	No visible stain
1	Very faint stain
2	Light stain
3	Moderate stain
4	Dark stain
5	Deep stain, unchanged after washing

The results of these tests helped determine which fabrics were most suitable for postpartum hospital maternity wear. Fabrics with better stain resistance, ease of cleaning, and comfort were prioritized for the final garment construction.

3.4.5 Prototype development and cost estimation

The finalized maternity wear designs were developed into prototypes to assess functionality, comfort, and aesthetics. This process involved the following steps:

3.4.5a Pattern drafting and construction

Patterns for postpartum maternity wear were meticulously drafted using flat pattern-making techniques and the Zarapkar System of Cutting. The designs prioritize comfort, ease of movement, and adaptability with features like adjustable waistbands and nursing-friendly openings. While the researcher handled drafting, a professional tailor managed the cutting and stitching. The six different patterns developed for postpartum maternity wear are

1. Drafting instructions for an A-Line one-piece with yoke and keyhole detail and its top variation

Square lines from point 0, on a four-layer fold, with folds at 2-0 and 5-0.

Front bodice

1-0 = One-fourth chest + 1.5 cm ($\frac{1}{2}$ ") ease.

2-0 = Full length + 1.5 cm ($\frac{1}{2}$ ") ease minus frill width.

3-0 = One-twelfth chest + 0.5 cm ($\frac{1}{4}$ ") ease.

4-0 = Same as 3-0 + 1.5 cm ($\frac{1}{2}$ ") ease.

Shape neckline 4-3.

5-0 = One-fourth chest - 1 cm ($\frac{1}{4}$ ") or shoulder + 0.5 cm ($\frac{1}{4}$ ") ease.

Square down from 5 to 6.

7-5 = 1.5 cm ($\frac{1}{2}$ ") ease.

Join 3-7.

8-1 = One-fourth chest + 4 cm ($1\frac{1}{2}$ ") ease.

9-6 = 2.5 cm (1") ease.

Shape armhole (scye) 7-9-8.

10-2 = Same as 8-1 + 4 cm ($1\frac{1}{2}$ ") ease.

Join 8-10.

Back bodice (cut on fold)

12-0 = 2 cm ($\frac{3}{4}$ ") ease (Back neck width).

Shape back neckline 12-3.

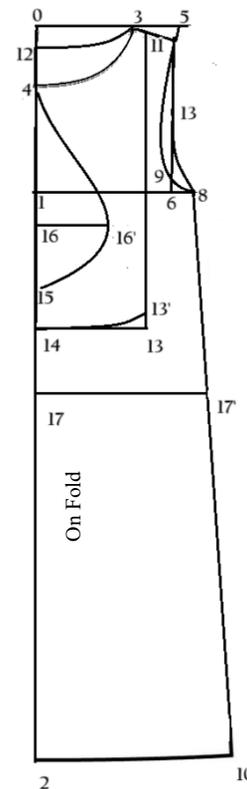


Plate 3.1: Adaptation of the for A-line one-piece with yoke and keyhole and its top

Shape back armhole (scye) 7-13 as shown.

Length of opening at centre back = Approximately half chest from 12 or opening from 12 to 2.

Yoke and keyhole detail (front bodice)

3-11= 6 cm

13-13'=2cm

Mark yoke line 36 cm below the neckline.

Draw a rectangular yoke approximately 6 cm wide, extending across the chest.

14-13=6 cm

Mark the centre front of the yoke.

15-14=10cm

1-16=6cm

16-16'=11cm

For top variation 0-17= Full length of top

Draw a teardrop-shaped keyhole 11cm wide shape 4-16'-15

Sleeve drafting instructions (cut 2 separately)

Square lines from point 0, with a fold at 2-0.

1-0 = One-eighth of the chest measurement + 6.5 cm (2½") ease.

2-0 = Sleeve length + 1 cm (¼") ease.

3-2 = Same as 1-0. Join 3-1 to complete the initial structure.

4-1 = One-eighth of the chest measurement.

5-0 = 2.5 cm (1") ease. Join 4-5 smoothly.

6 is midway between 4 and 5.

7-6 = 2 cm (¾") ease.

Shape the back side of the sleeve smoothly from 4-7-5-0.

Square up from 4 to 8.

8-4 = 5 cm (2") for ladies' garments and 4 cm (1½") for girls' garments.

Join 8-5 smoothly.

Take 1 cm (¼") above point 4, then shape the front side of the sleeve smoothly through 4-8-9-0.

10-2 = Half sleeve round + 1.5 cm (½") ease.

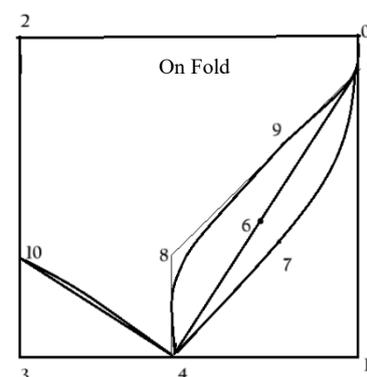


Plate 3.2: Sleeve Adaptation for A-line One-piece and Top Variation

Join and shape 4-10 smoothly.

Keep 3 cm (1¼") turn-in at 10-2 for hemming.

Keep 2 cm (¾") seam allowance at 10-4

2. Drafting instructions for A-Line one-piece with diagonal button closure and its top variation

Square lines from point 0, on a four-layer fold, with folds at 2-0 and 5-0.

Front bodice

1-0 = One-fourth chest + 1.5 cm (½") ease.

2-0 = Full length + 1.5 cm (½") ease minus frill width.

3-0 = One-twelfth chest + 0.5 cm (¼") ease.

4-0 = Same as 3-0 + 1.5 cm (½") ease.

Shape neckline 4-3.

5-0 = One-fourth chest - 1 cm (¼") or shoulder + 0.5 cm (¼") ease.

Square down from 5 to 6.

7-5 = 1.5 cm (½") ease.

Join 3-7.

8-1 = One-fourth chest + 4 cm (1½") ease.

9-6 = 2.5 cm (1") ease.

Shape armhole (scye) 7-9-8.

10-2 = Same as 8-1 + 4 cm (1½") ease.

Join 8-10.

Back bodice (cut on fold)

12-0 = 2 cm (¾") ease (Back neck width).

Shape back neckline 12-3.

Shape back armhole (scye) 7-13 as shown.

Length of opening at centre back =

Approximately half chest from 12 or opening from 12 to 2.

Diagonal button closure (front bodice)

14-13 = Diagonal line from neckline to waist for button closure

Placket width = 3 cm (1¼") (For facing)

Mark buttonholes along this diagonal line at 5 cm (2") intervals

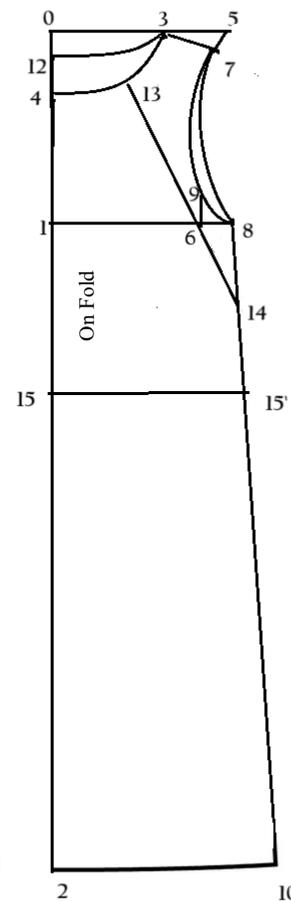


Plate 3.3: Adaptation of the Diagonal Button Closure for A-line One-Piece and Its Top Variation

0-15= Full length of Top

Back bodice (cut on fold)

12-0 = 2 cm ($\frac{3}{4}$ ") (Back neck width)

Shape neck 13-3 and scye 7-9-8 as shown

Sleeves (cut 2 separately) (Refer Plate 3.2 for Plain Sleeve)

Square lines from point 0, with a fold at 2-0.

1-0 = One-eighth of the chest measurement + 6.5 cm ($2\frac{1}{2}$ ") ease.

2-0 = Sleeve length + 1 cm ($\frac{1}{4}$ ") ease.

3-2 = Same as 1-0. Join 3-1 to complete the initial structure.

4-1 = One-eighth of the chest measurement.

5-0 = 2.5 cm (1") ease. Join 4-5 smoothly.

6 is midway between 4 and 5.

7-6 = 2 cm ($\frac{3}{4}$ ") ease.

Shape the back side of the sleeve smoothly from 4-7-5-0.

Square up from 4 to 8.

8-4 = 5 cm (2") for ladies' garments and 4 cm ($1\frac{1}{2}$ ") for girls' garments.

Join 8-5 smoothly.

Take 1 cm ($\frac{1}{4}$ ") above point 4, then shape the front side of the sleeve smoothly through 4-8-9-0.

10-2 = Half sleeve round + 1.5 cm ($\frac{1}{2}$ ") ease.

Join and shape 4-10 smoothly.

Keep 3 cm ($1\frac{1}{4}$ ") turn-in at 10-2 for hemming.

Keep 2 cm ($\frac{3}{4}$ ") seam allowance at 10-4.

3. Drafting instructions for A-Line one-piece with upper coat and its top variation

Square lines from point 0, on a four-layer fold, with folds at 2-0 and 5-0.

Front bodice

1-0 = One-fourth chest + 1.5 cm ($\frac{1}{2}$ ") ease.

2-0 = Full length + 1.5 cm ($\frac{1}{2}$ ") ease minus frill width.

3-0 = One-twelfth chest + 0.5 cm ($\frac{1}{4}$ ") ease.

4-0 = Same as 3-0 + 1.5 cm ($\frac{1}{2}$ ") ease.

Shape neckline 4-3.

5-0 = One-fourth chest - 1 cm ($\frac{1}{4}$ ") or shoulder + 0.5 cm ($\frac{1}{4}$ ") ease.

Square down from 5 to 6.

7-5 = 1.5 cm ($\frac{1}{2}$ ") ease.

Join 3-7.

8-1 = One-fourth chest + 4 cm ($1\frac{1}{2}$ ") ease.

9-6 = 2.5 cm (1") ease.

Shape armhole (scye) 7-9-8.

10-2 = Same as 8-1 + 4 cm ($1\frac{1}{2}$ ") ease.

Join 8-10.

Back bodice (cut on fold)

12-0 = 2 cm ($\frac{3}{4}$ ") ease (Back neck width).

Shape back neckline 12-3.

Shape back armhole (scye) 7-13 as shown.

Length of opening at centre back = Approximately half chest from 12 or opening from 12 to 2. the bodice).

Upper coat drafting

3-15=6cm

4-18= 25cm

18-16=18cm

19-14=24cm

13-14=2.5cm

14-14'=5cm Straps = Draw two vertical straps extending from the shoulder seam to the overlay bottom.

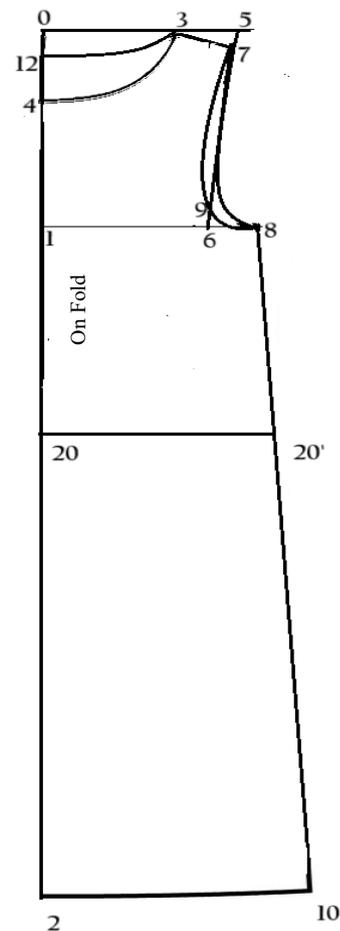


Plate 3.4 Adaptation of the for A-Line one-piece with welt opening and its top variation

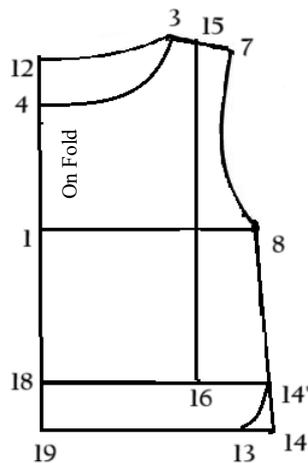


Plate 3.5: Upper coat

Horizontal Band = Create a band across the bust area, slightly extending beyond the overlay width.

0-20=Top length

Sleeves (Refer Plate 3.7 for Plain Sleeve)

Square lines from point 0, with a fold at 2-0.

1-0 = One-eighth of the chest measurement + 6.5 cm (2½") ease.

2-0 = Sleeve length + 1 cm (¼") ease.

3-2 = Same as 1-0. Join 3-1 to complete the initial structure.

4-1 = One-eighth of the chest measurement.

5-0 = 2.5 cm (1") ease. Join 4-5 smoothly.

6 is midway between 4 and 5.

7-6 = 2 cm (¾") ease.

Shape the back side of the sleeve smoothly from 4-7-5-0.

Square up from 4 to 8.

8-4 = 5 cm (2") for ladies' garments and 4 cm (1½") for girls' garments.

Join 8-5 smoothly.

Take 1 cm (¼") above point 4, then shape the front side of the sleeve smoothly through 4-8-9-0.

10-2 = Half sleeve round + 1.5 cm (½") ease.

Join and shape 4-10 smoothly.

Keep 3 cm (1¼") turn-in at 10-2 for hemming.

Keep 2 cm (¾") seam allowance at 10-4

26-21 = Half of the seat measurement plus 4 cm (1½"), minus 9-10 of the fronts. Shape 25-26-5.

Divide 23-25 into three equal parts and place darts 2 cm (¾") wide and 9 cm (3½") long at 27 and 28.

29-11 = One-sixth of the seat measurement (for side opening, if required).

Keep 6.5 to 9 cm (2½ to 3½") below 1-14 and 1-19 for inturns.

Waist band

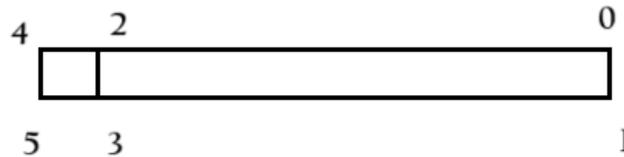


Plate 3.7: Waistband

1. Elasticated waistband

1-0: Measure 4 cm (1½") or adjust as needed.

2-0 and 3-1: Should be equal to the waist measurement before gathering/stretching.

Extra Allowance: Add 4 to 5 cm (2") at 2-3 for adjustments.

Elastic Length: Typically, waist measurement minus 5 to 10 cm, depending on stretchability.

2. Cord waistband

1-0: Measure 4 cm (1½") or adjust as needed.

2-0 and 3-1: Should be equal to the waist measurement before inserting the cord.

Extra Allowance: Add 4 to 5 cm (2") at 2-3 for adjustments.

Cord Length: Typically, waist measurement plus extra length for tying.

3. Partially elasticated waistband (combination of elastic & cord)

1-0: Measure 4 cm (1½") or adjust as needed.

2-0 and 3-1: Should be equal to the waist measurement before inserting elastic/cord.

Extra Allowance: Add 4 to 5 cm (2") at 2-3 for adjustments.

Elastic Placement: Generally, at the back half or sides of the waistband, with the cord at the front.

Cord Length: Similar to a cord waistband, allowing extra for tying.

Garment stitching and assembly

- The prototypes were stitched following industry-standard construction techniques, considering durability and comfort.

- Special attention was given to seam finishes, closures, and functional design elements such as breastfeeding access and adjustable waistbands.

3.4.5b cost estimation

The cost sheet was prepared using a structured methodology to ensure accurate cost estimation for garment production. Fabric consumption was calculated based on the pattern layout, and material costs were determined using market prices. Fasteners and trimmings were accounted for based on quantity requirements. Stitching costs, including buttonhole making and labour charges, were documented based on professional tailoring rates. Finally, all components were summed up to determine the grand total cost per garment, ensuring transparency in production expenses.

Table 3.6: Cost sheet

Cost sheet			
Style			
Fabric consumption and cost per garment			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Total Cost (₹)			
Fasteners and Trimmings cost			
Item	Quantity	Total Cost (₹)	
Button			
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
Stitching Cost per Top			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
Grand Total Cost for Top			

3.5 Testing and Evaluation

In this phase, the final product underwent clinical evaluation in a hospital setting to assess its effectiveness, safety, and user acceptability. A mixed-methods approach was employed, incorporating both quantitative and qualitative data analysis.

3.5.1 Participant selection

Twelve postpartum women (aged 18–45) from SSG and GMERS hospitals (six from each) were selected using purposive random sampling for a 10-hour wear trial of one maternity garment. Each participant tested either three one-piece outfits or three top-bottom sets with different bottom variations while performing routine postpartum activities. Participants, who had undergone either vaginal or C-section delivery, provided feedback on comfort, functionality, and hygiene through an evaluation form (Anexture-5). The inclusion of participants from different hospital environments ensured a comprehensive evaluation, aiding in the refinement of maternity garment designs for enhanced postpartum comfort and usability.

3.5.2 Preparation of evaluation metric:

Evaluation metrics were created to assess various aspects of the maternity wear, including:

Table 3.7: Evaluation metrics for maternity garments

Usability Metrics	Acceptability Metrics
Fabric Softness	Dignity & Respect
Skin Irritation	Design Aesthetics
Breathability	Sustainability
Absorbency	Overall Satisfaction
Stretch & Flexibility	
Ease of Wearing & Removing	
Breastfeeding accessibility	
Odor Resistance	

3.5.3 Conduct wear trial

The hospital trial was conducted over a shorter period to evaluate the functionality, comfort, and practicality of maternity garments. The trial took place at GMERS Hospital and SSG Hospital, each involving six postpartum women—three wearing one-piece garments (A, B, C) and three wearing top-bottom sets (D, E, F). Participants followed a structured six-day rotational schedule, ensuring that each garment was tested equally. Over the first three days, each participant wore a different garment daily, and the same rotation was repeated on Days 4 to 6 for consistency. The garments were washed and dried overnight for continued use.

Table 3.8a: SSG hospital wear trial (6 samples, days 1-3)

Participant	Day 1	Day 2	Day 3
Woman 1 (One-Piece)	A	B	C
Woman 2 (One-Piece)	B	C	A
Woman 3 (One-Piece)	C	A	B
Woman 4 (Top-Bottom)	D	E	F
Woman 5 (Top-Bottom)	E	F	D
Woman 6 (Top-Bottom)	F	D	E

Table 3.8b: GMERS hospital wear trial (6 samples, days 4-6)

Participant	Day 4	Day 5	Day 6
Woman 1 (One-Piece)	A	B	C
Woman 2 (One-Piece)	B	C	A
Woman 3 (One-Piece)	C	A	B
Woman 4 (Top-Bottom)	D	E	F
Woman 5 (Top-Bottom)	E	F	D
Woman 6 (Top-Bottom)	F	D	E

3.5.4 Collection of feedback

At the conclusion of the wear trial, feedback was collected from postpartum women using a structured evaluation form designed to assess the garments based on predefined metrics. To facilitate this process, a Google Form was created, allowing participants to easily complete the form at their convenience. This approach not only reduced the burden of in-person data collection but also ensured organized responses, including both quantitative ratings and qualitative insights. Additionally, Google Forms automatically compiled responses, making it easier to analyse feedback, identify trends, and inform future design improvements.

3.5.5 Analysis of feedback

The data analysis involved both quantitative and qualitative approaches to evaluate the maternity garments based on postpartum women's feedback. The analysis included descriptive statistics Average and percentage calculations for attribute evaluations, Rank Order Analysis for garment preferences, and qualitative analysis for user feedback.

Descriptive statistics and attribute evaluation

Quantitative data from participant responses were analysed using descriptive statistics, including averages and percentages. Key garment attributes such as comfort, fit, breathability, fabric quality, and ease of wear were rated on a Likert scale. The mean

ratings and percentage distribution for each attribute were calculated to assess overall satisfaction. This helped in identifying strengths and areas requiring improvement in maternity garment design.

Rank order analysis for garment preferences

A Rank Order Analysis was conducted to determine the preference ranking of garments A, B, C and D, E, F Each garment was evaluated based on the number of times it was placed in 1st, 2nd, and 3rd positions. A scoring system was established where a 1st place ranking received 3 points, a 2nd place ranking received 2 points, and a 3rd place ranking received 1 point.

Ranking the garments: The garments were ranked in descending order based on their total points. The garment with the highest score was considered the most preferred, while lower scores indicated moderate preference levels. In case of a tie, both garments were categorized under the same preference level.

Qualitative Feedback analysis

In addition to quantitative rankings, qualitative feedback from postpartum women was analysed to identify common themes and suggestions. Comments were categorized into key themes such as fabric comfort, ease of breastfeeding access, fit adaptability, and overall aesthetic appeal. Common concerns and suggestions were documented to guide design improvements. By integrating both numerical data and user feedback, this comprehensive analysis provided valuable insights into the garments' performance. The findings informed targeted modifications to enhance comfort, functionality, and overall satisfaction with maternity wear.

3.5.6 Interpretation of data

The analyzed data would be interpreted in a manner that the findings and observations are presented with thorough understanding.

3.5.7 Recommendations

Based on the wear trials and data analysis, several recommendations were made for future studies to further enhance the design and functionality of maternity clothing,

CHAPTER IV

RESULTS AND DISCUSSION

This study aimed to design and develop safe, comfortable, and functional postpartum maternity wear that addressed the specific needs of postpartum women in public healthcare hospitals. The garments were designed to provide ease of wear, accessibility for medical procedures, and comfort, ensuring a dignified and practical clothing solution. Additionally, the study focused on using sustainable materials and efficient design to enhance user experience while minimizing environmental impact.

The study was carried out in three phases. The first phase involved identifying need gaps, including a survey of existing maternity wear and the challenges faced by postpartum women. The second phase focused on design solutions and development, which included creating user personas, conceptual design development, finalizing designs, and developing prototypes. The third phase involved testing and evaluation, where wear trials were conducted with selected participants, feedback was collected, and an analysis was performed to refine the final product.

The results obtained are presented under the following sub-headings:

4.1 Need gap identification

4.1.1 Findings from hospital survey with postpartum women

4.1.1a Demographic profile of postpartum women

4.1.1b Insights from postpartum women

4.1.1c Demographic profile of healthcare provider

4.1.1d Insights from healthcare providers

4.1.2 Market survey observations

4.1.3 Additional observation

3.4 Design solutions and development of postpartum maternity wear

3.4.1 Create user persona

3.4.2 Conceptual design development

3.4.3 Finalize designs and specification sheet

3.4.3 Fabric selection and performance testing

3.4.5 Prototype development and preparation of bill of material sheet

4.3 Testing and Evaluation

4.3.1 Conduct wear trials

4.3.2 Analysis of data

4.3.3 Recommendations

This structured approach ensures that the developed postpartum maternity wear is practical, user-friendly, and aligned with the needs of postpartum women, offering a well-researched and tested solution for public healthcare settings.

4.1 Need-gap identification

4.1.1 Findings from hospital survey with postpartum women

A survey at SSG Hospital and GMERS Medical College and Hospital in Vadodara revealed that postpartum women were not provided with maternity wear in public healthcare settings. The data collected through survey (Table 4.1) was analysed and the findings are listed below which highlights the understanding of their need and preferences for maternity wear in public healthcare hospitals.

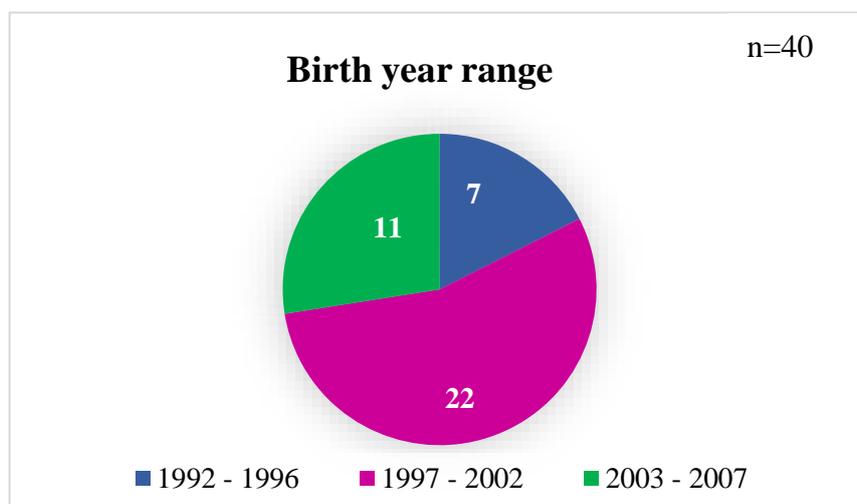
Table 4.1: Distribution of respondents by category and hospital

Category	SSG Hospital (n=27)	GMERS Hospital (n=27)	Total (n=54)
Postpartum Women	20	20	40
Healthcare Providers	7	7	14

4.1.1a Demographic profile of postpartum women

The demographic characteristics of postpartum women from SSG and GMERS hospitals. includes the following key variables, which were analysed.

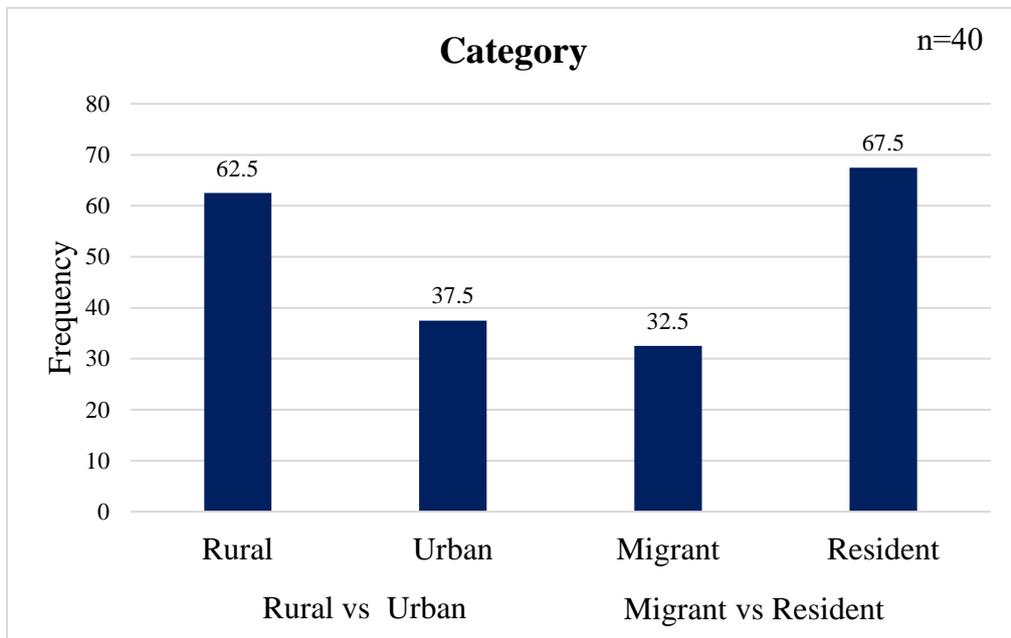
I. Age distribution and first-time delivery



Graph 4.1: Distribution of birth year range of postpartum women

The study found that 55 per cent of postpartum women were aged 22-27 (born 1997-2002), making early to mid-20s the most common age for childbirth. Younger mothers (17-21 years, born 2003-2007) accounted for 27.5 per cent, indicated a need for extra postpartum support. Only 17.5 per cent were older mothers (28-32 years, born 1992-1996), suggesting fewer women in their late 20s experienced childbirth. These findings suggested maternity wear (post-partum stage) can be primarily catered to women in their early to mid-20s while considering the needs of younger and slightly older mothers. Since most postpartum women were first-time mothers, their changing body measurements, including bust girth, played a crucial role in maternity wear design

II. Category:



Graph 4.2: Percentage distribution of postpartum women: rural vs. urban and migrant vs. resident

Rural vs. Urban

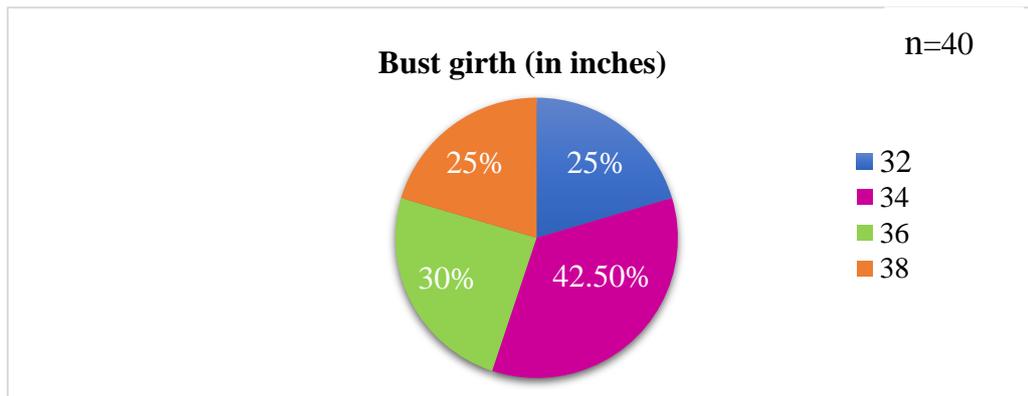
The higher frequency of rural individuals (62.5 per cent) compared to urban individuals (37.5 per cent) suggested that rural communities had a greater presence or involvement in the given context.

This could have indicated stronger participation, representation, or impact of rural populations in the study, possibly due to factors such as accessibility, socio-economic conditions, or cultural influences.

Migrant vs. Resident

The frequency of residents (67.5 per cent) was substantially higher than that of migrants (32.5 per cent), implying that residents played a more dominant role in the observed scenario. This difference might have reflected challenges faced by migrants, such as social integration, economic stability, or access to resources, which could have limited their involvement or representation.

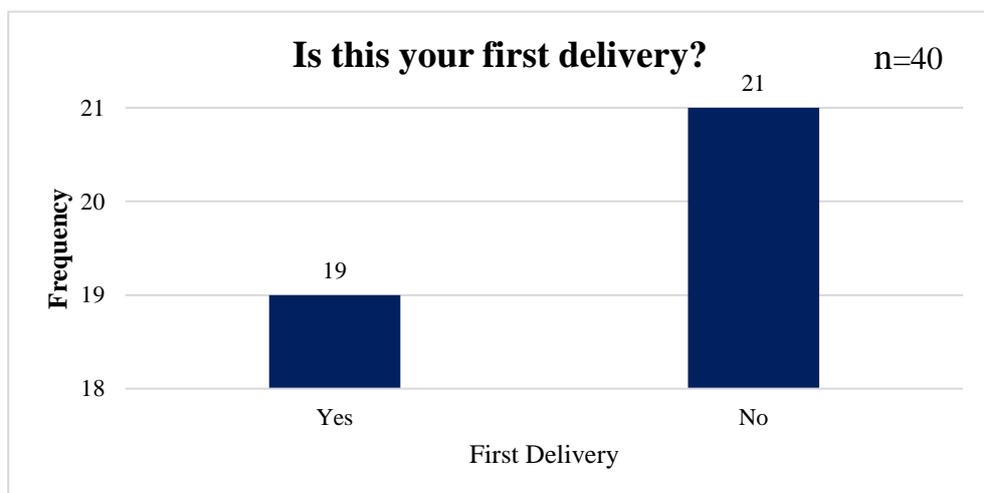
III. Bust girth



Graph 4.3: Percentage distribution of bust girth measurements (in inches)

The bust girth analysis showed that 34 inches (36.8 percent) and 36 inches (31.6 percent) were the most common sizes, accounting for 68.4 percent of postpartum women. Additionally, 32 inches (21.1 percent) was also a notable size. It was observed that a majority of postpartum women in the study had a relatively lean body structure, as indicated by the prevalence of these bust measurements.

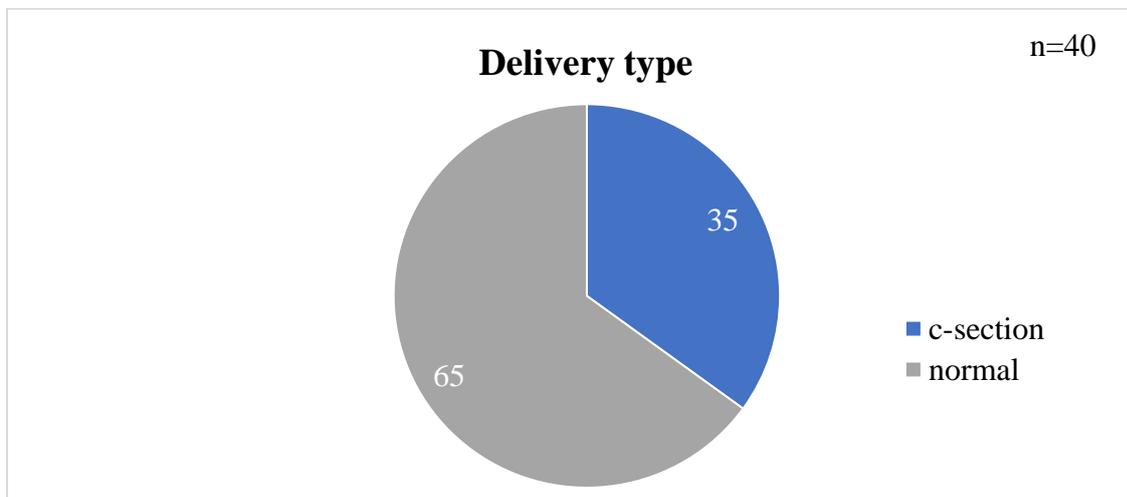
IV. First-time vs. Experienced mothers



Graph 4.4: Distribution of first-time vs. experienced mothers

The data revealed that 45 per cent of respondents were first-time mothers, while 55 per cent had previous childbirth experiences, highlighting differing postpartum needs. First-time mothers required more guidance and support, prioritizing comfort, ease of movement, and accessibility, with a preference for user-friendly designs like front-open gowns and breathable fabrics. Experienced mothers, already familiar with postpartum recovery, focused more on practicality and durability while balancing newborn care. Maternity wear should cater to both groups, ensuring comfort, convenience, and functionality tailored to their specific postpartum experiences.

V. Delivery type



Graph 4.5: Delivery type

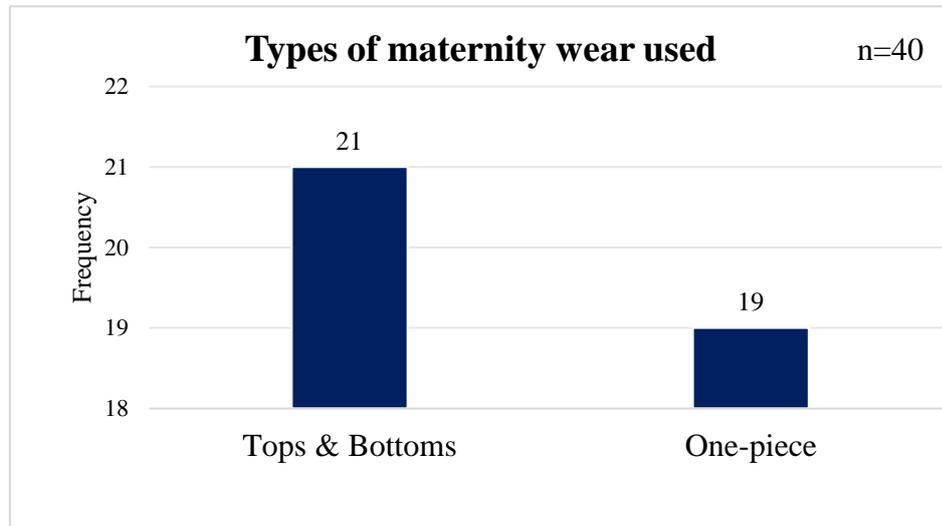
The data indicated that mothers who underwent C-section deliveries, accounting for 35 percent, required a longer recovery period and benefited from loose, non-restrictive clothing that minimized pressure on the incision. Soft, breathable fabrics and front-open designs provided comfort and facilitated movement during recovery.

In contrast, mothers who had normal deliveries, comprising 65 percent, generally experienced a faster recovery but still prioritized comfort, absorbency, and ease of nursing in their clothing choices.

These insights highlighted the need for postpartum clothing with adaptive designs that catered to both groups, incorporating breathability, stain resistance, and nursing-friendly features to ensure optimal support and convenience.

4.1.1.b Insights from postpartum women

i. Types of maternity wear currently used



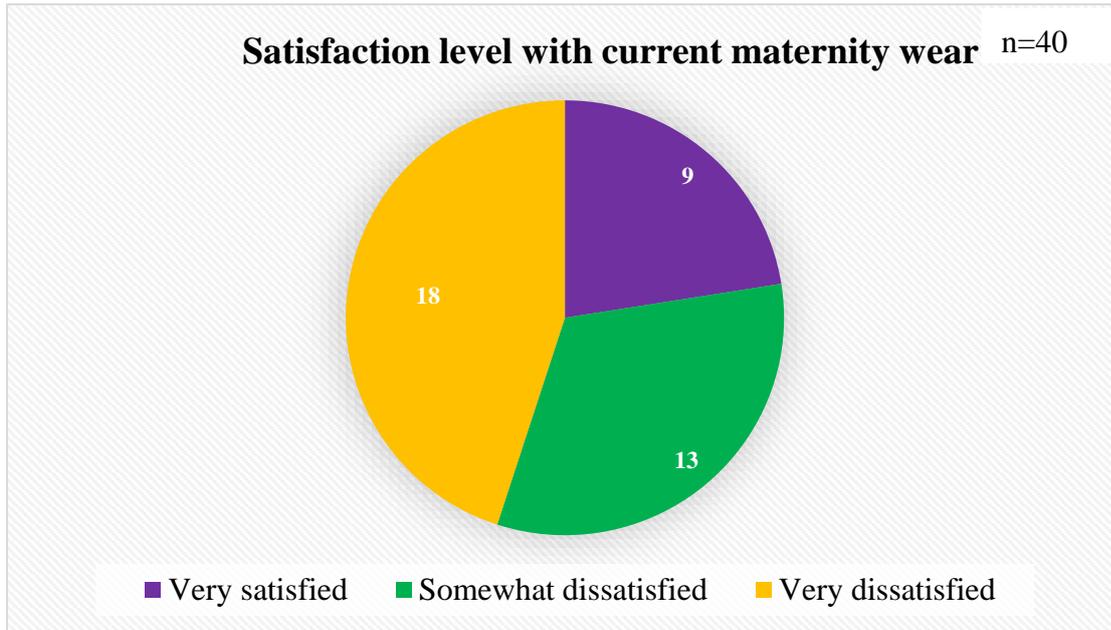
Graph 4.6: Types of maternity wear currently used

The data revealed that 60 per cent of respondents preferred one-piece maternity wear, driven largely by religious and cultural factors. Many women from conservative backgrounds favoured one-piece garments for their modesty, full coverage, and alignment with religious dress norms. Additionally, these garments offered nursing convenience and postpartum comfort, making them particularly popular in regions where modesty and ease of movement were key considerations.

In contrast, 40 per cent of women opted for top-bottom sets, valuing their versatility, ease of changing, and personal style. These garments were more appealing to women in urban areas or less conservative backgrounds who prioritized comfort and fashion. However, top-bottom sets provided less coverage, which may have been less acceptable for women from more traditional cultural or regional settings. These preferences highlight the need for maternity wear that balances cultural respect, comfort, and functionality while addressing regional and individual style choices.

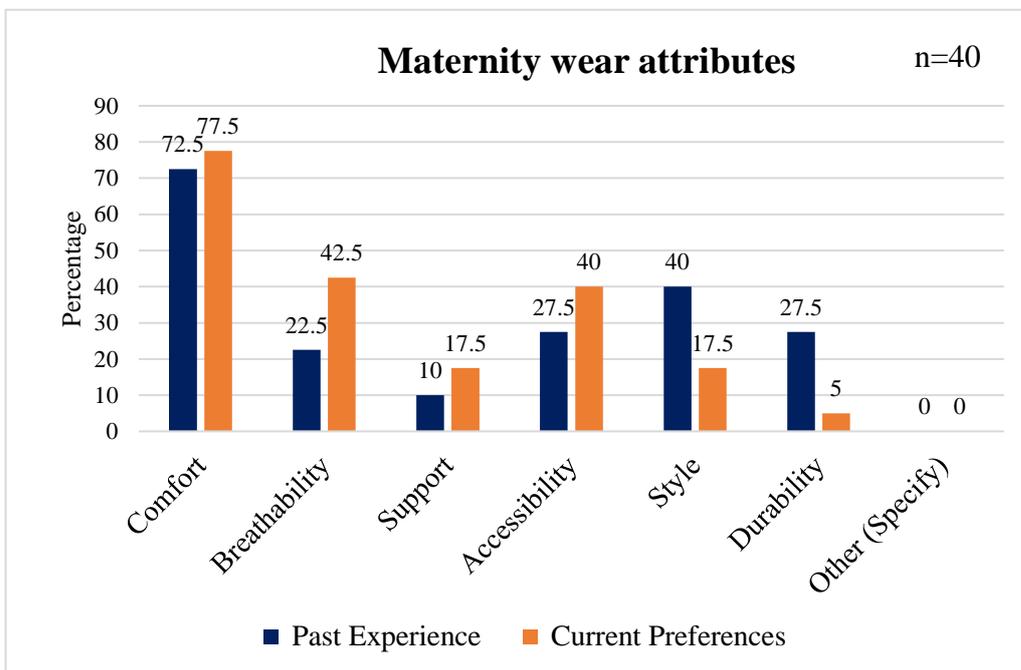
ii. Satisfaction level with current Maternity wear

The data revealed that 50 per cent of respondents were very dissatisfied, indicating major issues with comfort, fit, or functionality. Another 25 per cent were somewhat satisfied, suggesting that while some features were acceptable, improvements were needed. Only 25 per cent were very satisfied, implying that certain designs met their expectations.



Graph 4.7: Percentage distribution of satisfaction level with hospital-provided maternity wear

iii. **Maternity wear attributes**



Graph 4.8: Percentage distribution of Comparison of past experience and current preferences for maternity wear attributes

Comfort remained the top priority, but its pairing with other features shifted, reflecting evolving postpartum needs. Accessibility gained importance, highlighting a growing

demand for ease of breastfeeding and movement. Breathability also became more significant, likely due to concerns about postpartum comfort and hygiene. In contrast, style and durability decreased in priority, suggesting a stronger focus on practicality and functionality over aesthetics.

iv. Importance of maternity wear

The analysis of prioritized features in postpartum maternity wear indicates that comfort remains the most crucial factor, as consistently rated "Most Important" by all respondents.

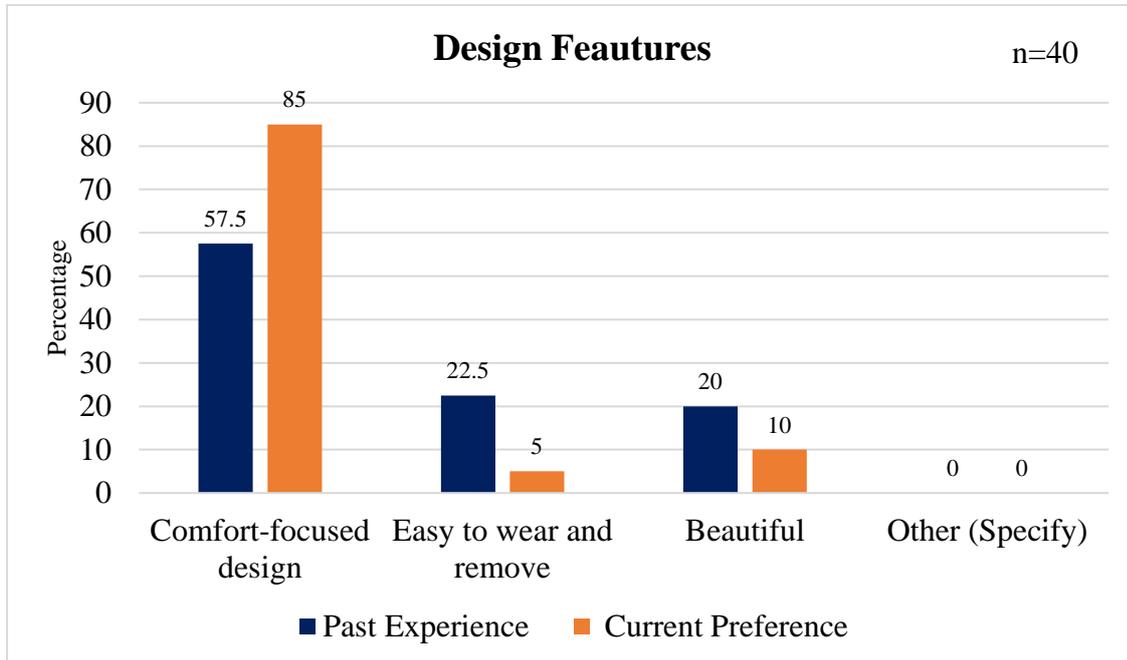
All respondents reported experiencing face discomfort in the past, indicating it is a common issue. This suggests the need to explore possible causes, such as fabric choice or prolonged wear, and develop solutions to improve comfort.

The responses indicate that comfortable material, breathable fabric, and loose garments are highly valued by postpartum women, emphasizing the need for soft, non-irritating, and airy fabrics that ensure ease of wear. Ease of movement is another crucial factor, as mothers prefer garments that allow flexibility and mobility during daily activities. Nursing accessibility is a dominant theme, with features like easy-to-nurse designs and button-front closures being frequently mentioned. These elements highlight the importance of convenient breastfeeding solutions. Additionally, hygiene and stain management are significant concerns, with preferences for easy-to-clean fabrics and dark colors to minimize visible stains. Ease of removal and accessibility further suggest that postpartum women prefer practical and functional clothing that simplifies dressing and undressing, particularly for those recovering from childbirth. These insights reinforce the need for maternity wear that balances comfort, functionality, and hygiene to enhance the postpartum experience.

v. Maternity wear design feature: past experience vs. Current preferences

Comfort was the top priority, surpassing ease of wear and aesthetics. Previously, comfort was balanced with beauty, but fifty percent of respondents prioritized it above all. Accessibility for nursing became more important, with sixty percent emphasizing ease of breastfeeding and movement. Breathability remained significant, but stretchability was replaced by structured openings for better nursing access. Hygiene and ease of

cleaning also gained importance, shifting the focus from fabric softness to maintenance-friendly materials.

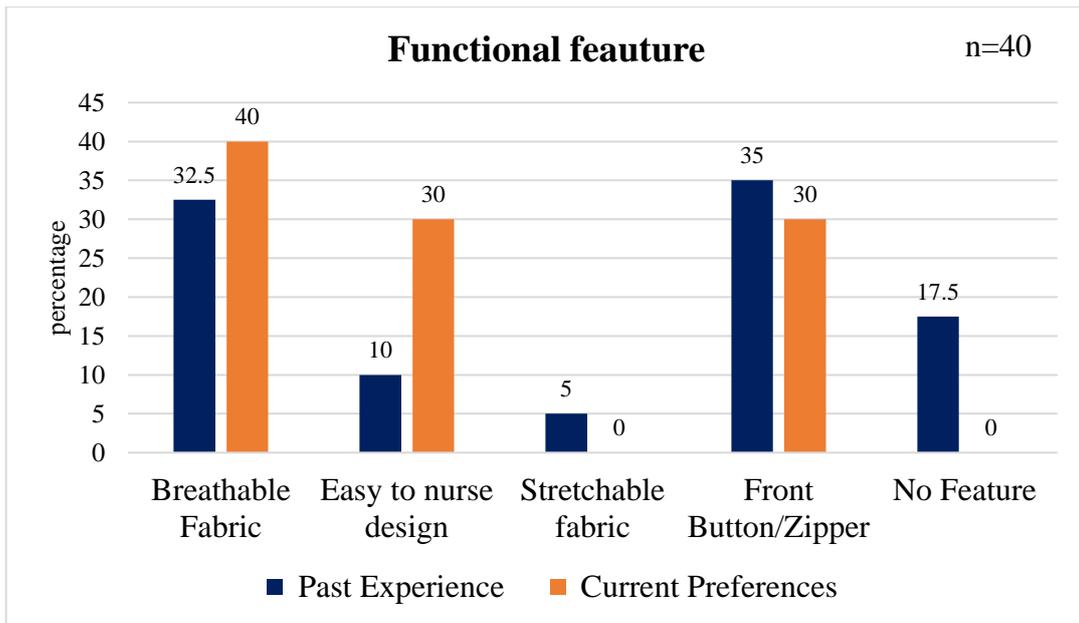


Graph 4.9: Percentage distribution of key design features attributes of maternity wear: past vs. Present

vi. Functional features

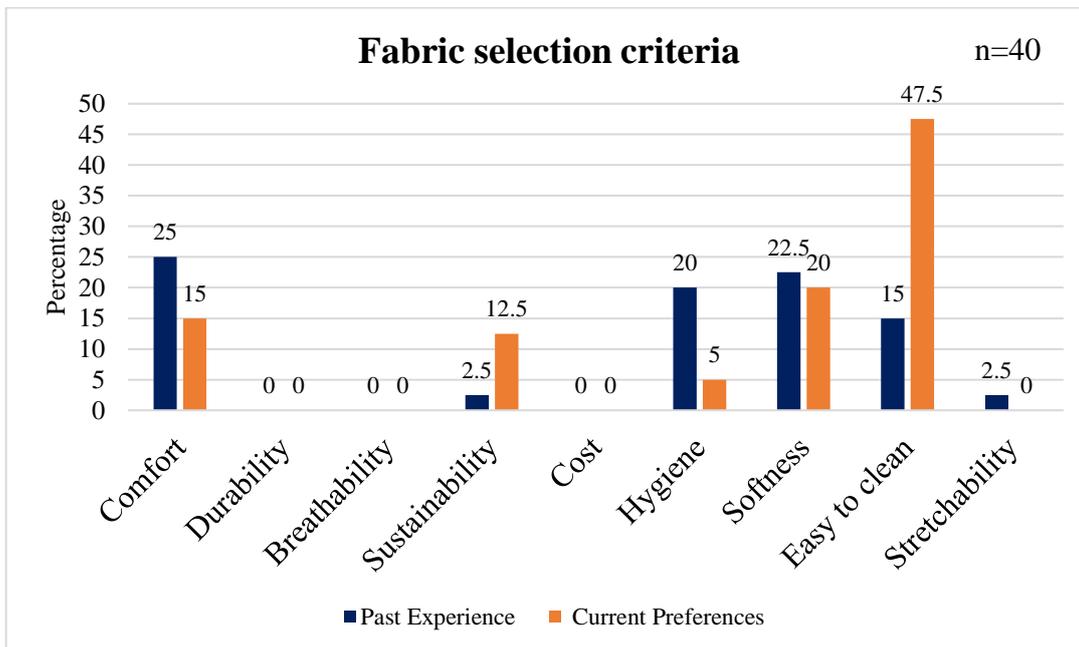
The graph highlighted a shift in maternity wear preferences among 40 participants. Preference for breathable fabric increased from 32.5 per cent to 40 per cent, and easy-to-nurse design rose from 10 per cent to 30 per cent, while stretchable fabric (5 per cent) was no longer preferred. Front button/zipper use slightly declined from 35 per cent to 30 per cent but remained important. Notably, those with no functional preference (17.5 per cent) dropped to 0 per cent, emphasising the growing demand for functional features.

Previously, breathable and stretchable fabrics were key, but now easy-to-nurse designs and front zippers are more valued. While breathability remains important, stretchability has been replaced by structured openings for better nursing access. The clearer functional preferences suggest insights gained from research and wear trials, leading to more practical and user-friendly designs.



Graph 4.10: Percentage distribution of key functional features attributes of maternity wear: past vs. Present

vii. Fabric selection criteria

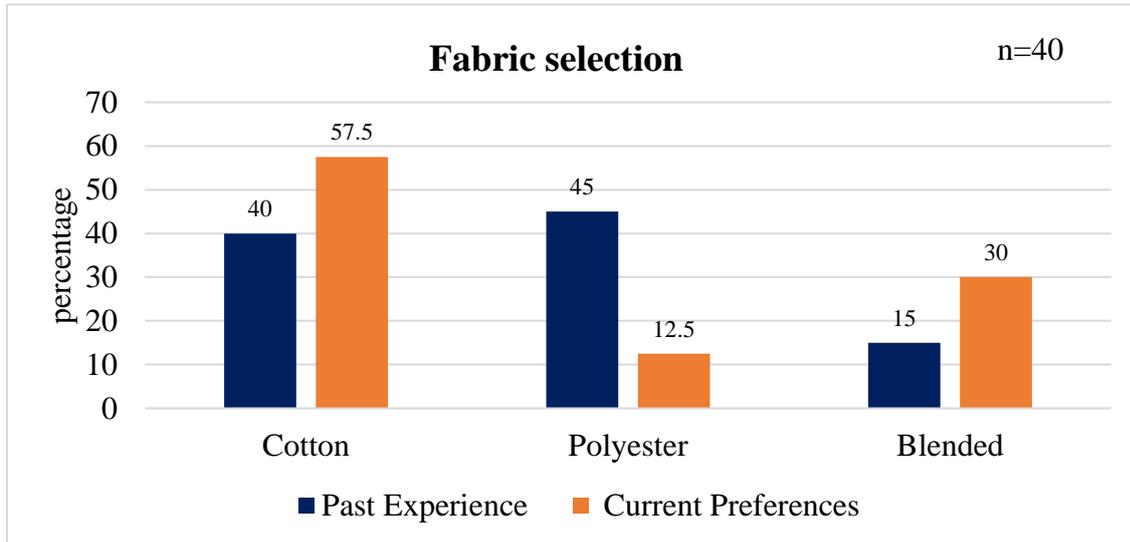


Graph 4.11: Percentage distribution of factor important in choosing fabric: past vs present

Earlier, softness, stretchability, and comfort were the key fabric selection factors. Now, the focus has shifted to ease of cleaning, hygiene, and breathability, indicating a preference for practicality and maintenance over just feel. While softness and comfort

are still considered, hygiene and functionality have become more dominant, likely influenced by hospital environments and postpartum needs.

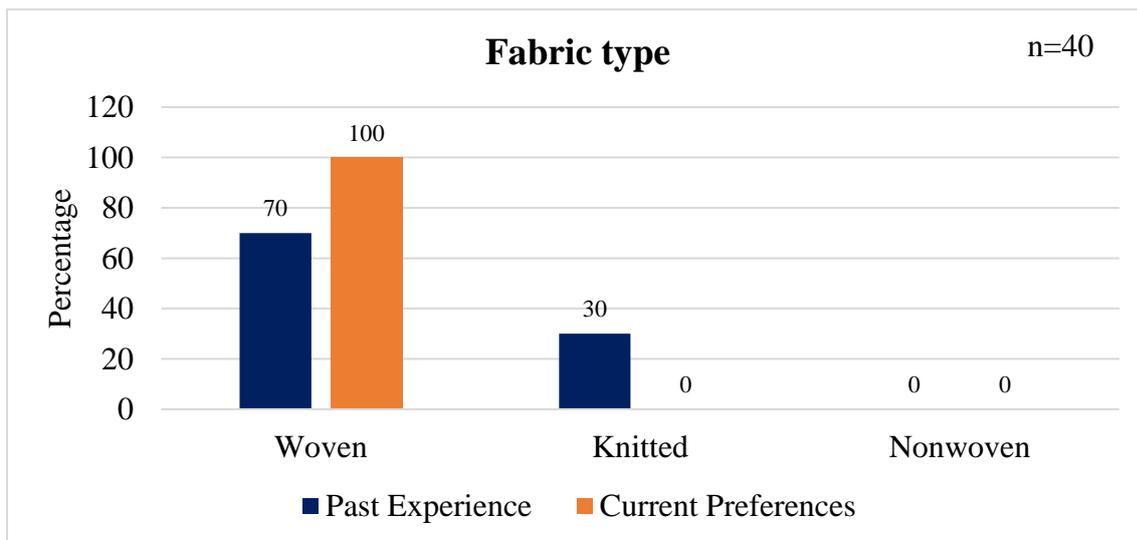
viii. Fabric preference



Graph 4.12: Percentage distribution of fabric use: past vs present

Cotton remained the most preferred fabric in both past and present choices, emphasizing its comfort and breathability. However, the use of blended fabrics increased by twenty percent, reflecting a demand for durability and easy maintenance. Polyester, while still used, declined by fifteen percent, likely due to concerns about comfort and breathability.

ix. Fabric type

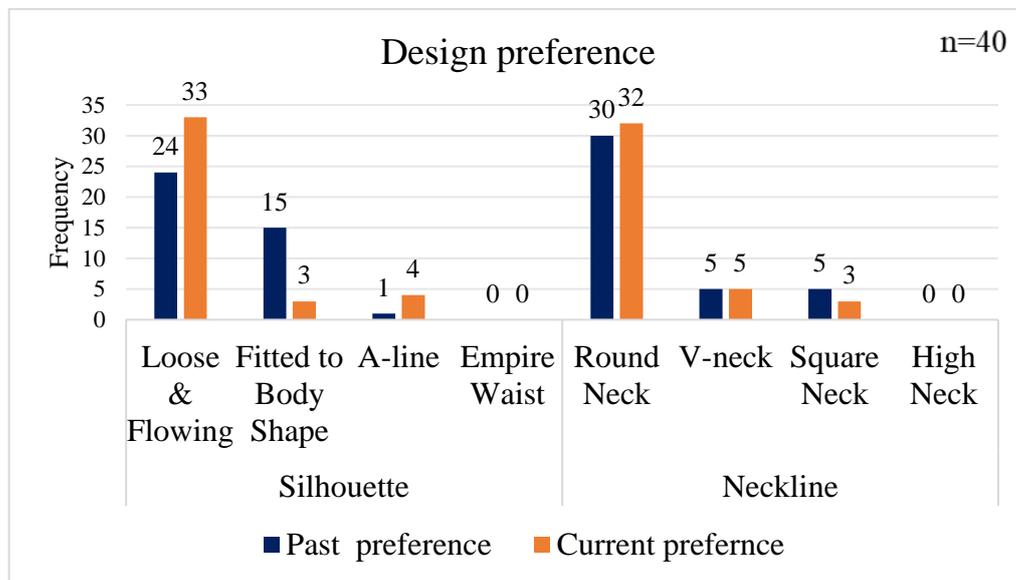


Graph 4.13: Percentage distribution of fabric type: past vs present

There is a clear shift towards woven fabrics, which now dominate the current selection. Previously, there was a mix of woven, knitted, and non-woven fabrics, but knitted fabrics have significantly decreased. This shift suggests a preference for better durability, structure, and ease of maintenance, which woven fabrics typically provide over knitted ones.

x. Additional design preference

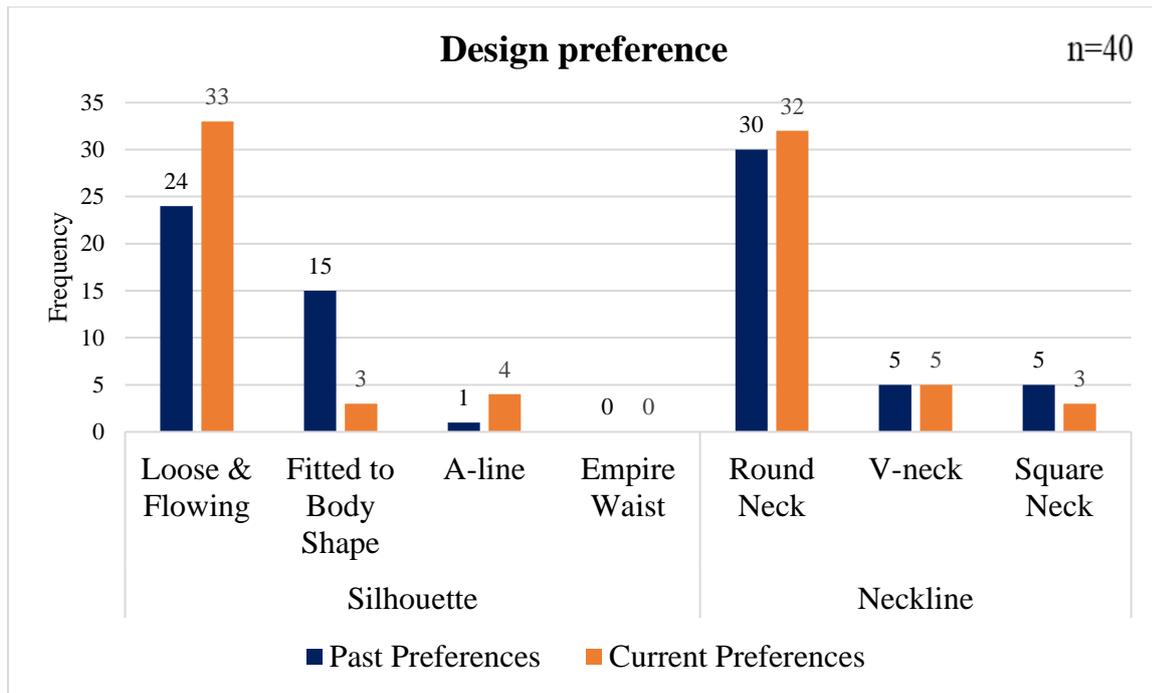
The study revealed significant shifts in maternity wear preferences, highlighting evolving postpartum needs and priorities



Graph 4.14a: Design preference: Silhouette and Neckline

Silhouette preferences- Loose and flowing silhouettes became the most preferred style, increasing from 60 per cent in the past to 82.5 per cent in current selections. Fitted designs saw a major decline from 37.5 per cent to 7.5 per cent, indicating a shift towards comfort and ease of movement.

Neckline preferences- round necklines remained the most favoured, with a slight increase from 75 per cent to 80 per cent. Preferences for V-neck (12.5 per cent) and square neck designs (7.5 per cent) remained stable, while high necklines continued to be absent from selections.



Graph 4.14b: Design preference: Sleeve and Length of the maternity wear

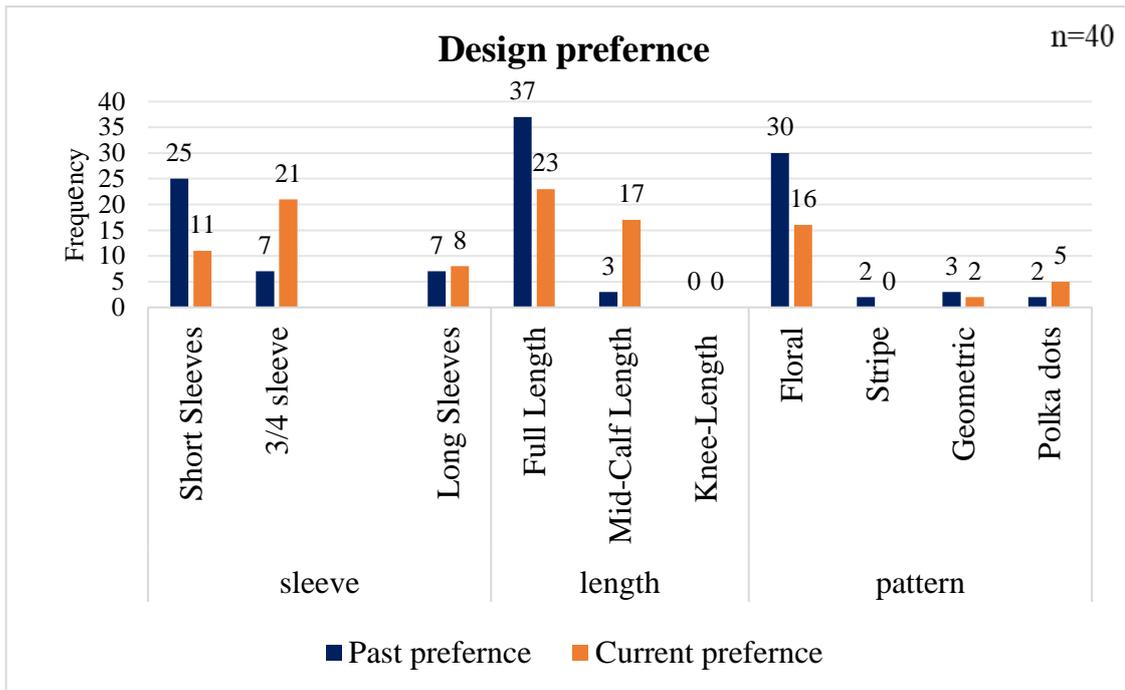
Sleeve preference- short sleeves, which were previously dominant at 62.5 per cent, declined to 27.5 per cent, while 3/4 sleeves became the most preferred choice, increasing from 17.5 per cent to 52.5 per cent. Long sleeves also saw a slight rise from 17.5 per cent to 20 per cent, reflecting a preference for better coverage.

Length preferences- The preference for full-length garments dropped from 92.5 per cent to 57.5 per cent, while mid-calf-length designs gained popularity, rising from 7.5 per cent to 42.5 per cent, indicating a balance between coverage and practicality.

Pattern preferences-Floral prints, once preferred by 75 per cent of respondents, declined to 40 per cent, while solid colors saw a significant rise from 7.5 per cent to 42.5 per cent. Polka dots increased in preference from 5 per cent to 12.5 per cent, while stripes were no longer favoured.

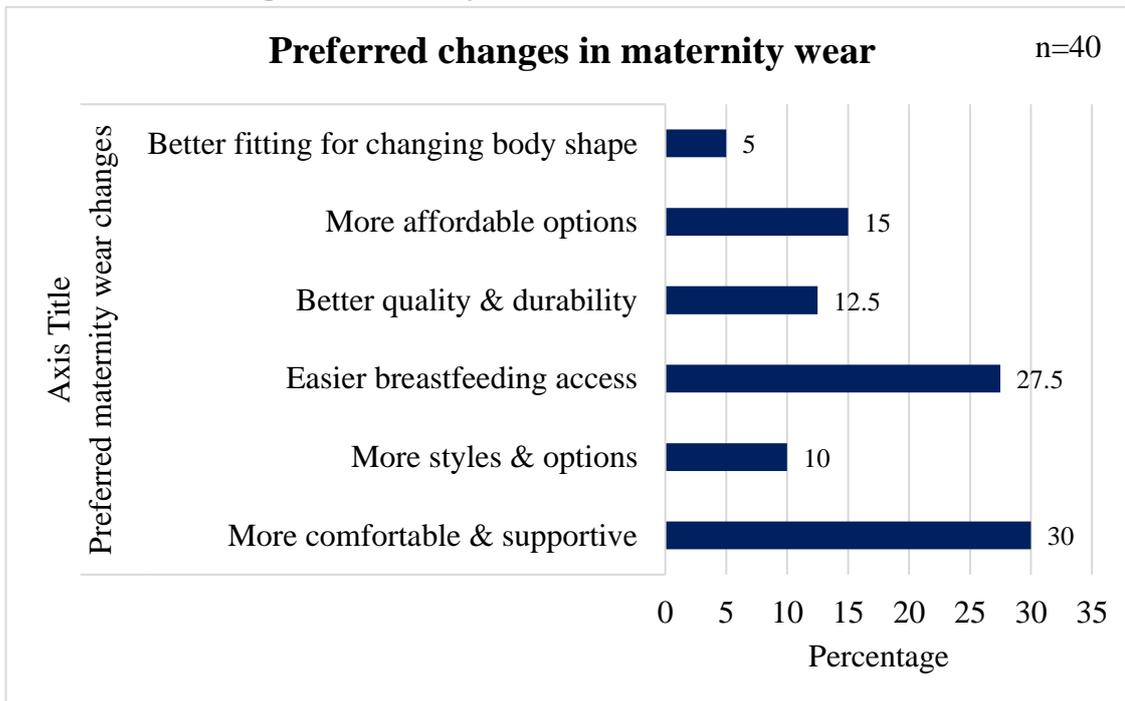
Pattern placement- small patterns remained the most preferred, though their selection dropped from 77.5 per cent to 52.5 per cent. Large patterns gained popularity, increasing from 20 per cent to 40 per cent, suggesting a growing acceptance of bold designs.,

Color palette preferences-Dark tones emerged as the most dominant choice, rising from 25 per cent to 85 per cent, while bright and bold colors (2.5 per cent), soft and calm shades (0 per cent), and light and neutral tones (12.5 per cent) declined in preference.



Graph 4.14c: Design preference: Sleeve and Length of the maternity wear

xi. Preferred changes in maternity wear

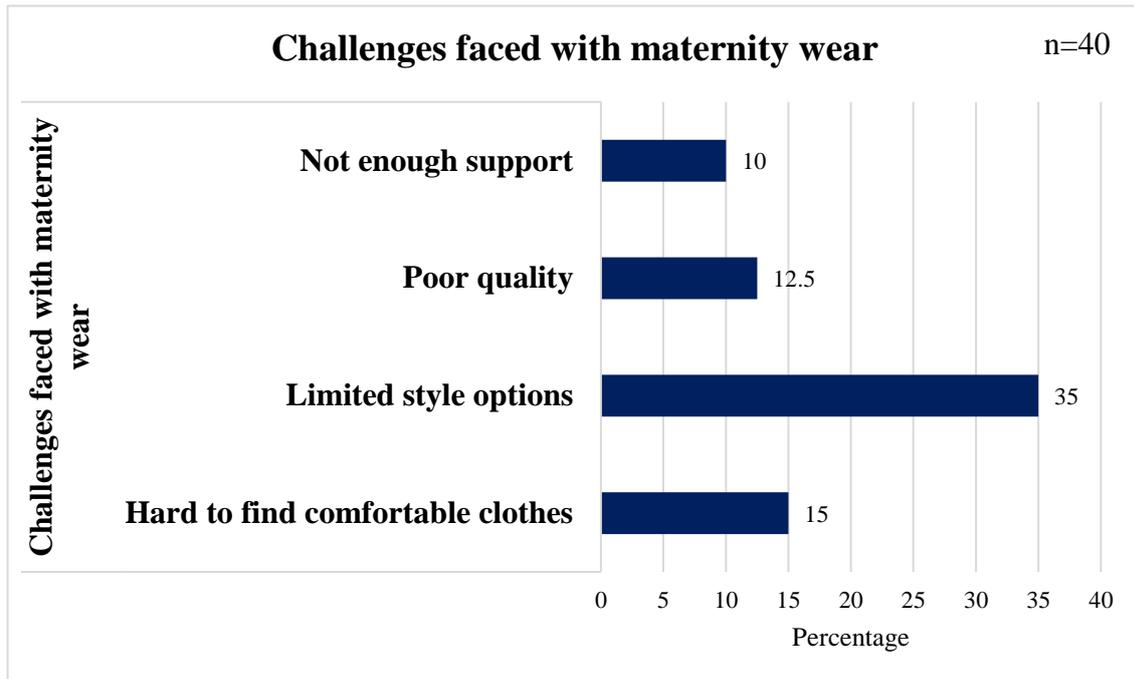


Graph 4.15: Percentage distribution of changes suggested for maternity wear

A significant number of women emphasized the need for more comfortable and supportive maternity wear, with 30 per cent of respondents highlighting the importance of soft, breathable fabrics and ergonomic designs that adapt to the postpartum body changes. The second most requested feature was easier breastfeeding access, with 27.5

per cent of women emphasizing the necessity of functional openings and nursing-friendly designs. Additionally, 12.5 per cent of respondents sought better quality and durability, while 15 per cent prioritized more affordable options. These preferences clearly show that postpartum women prioritize comfort, practicality, and affordability in their maternity wear, with a particular focus on designs that accommodate nursing and body changes after childbirth.

xii. Challenges faced with maternity wear

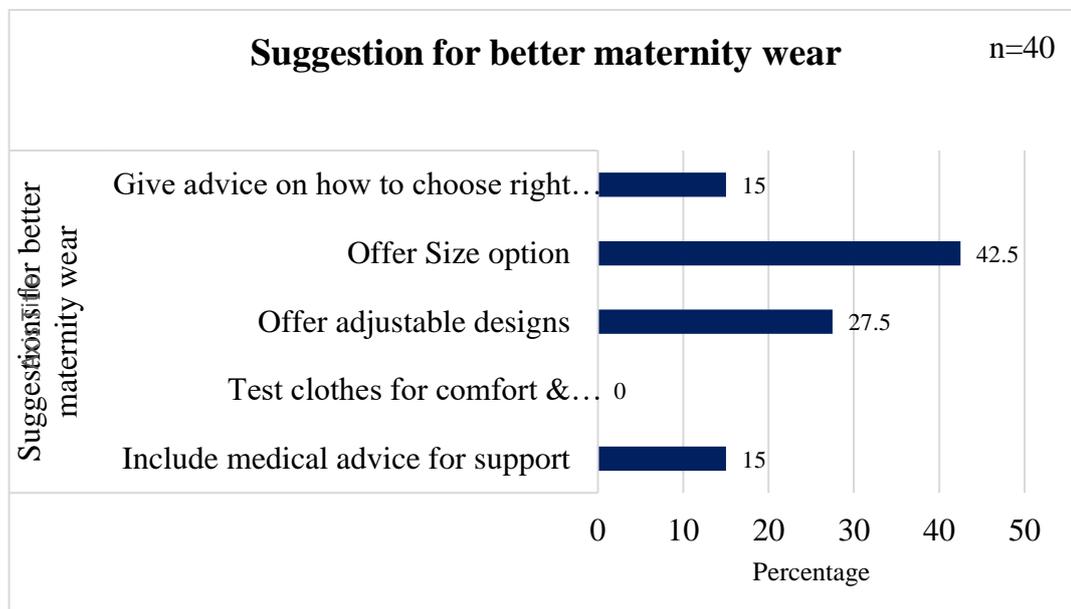


Graph 4.16: Percentage distribution of experienced any challenges with maternity wear

The most common challenge faced by postpartum women was the limited availability of clothing, with 35 per cent of respondents feeling restricted in their fashion choices. This suggests a gap in the market for fashionable yet practical postpartum wear. Furthermore, 27.5 per cent of women reported difficulties in finding well-fitting clothes after childbirth, pointing to the need for more adjustable, size-inclusive designs. Other concerns included poor garment quality (12.5 per cent) and lack of support (10 per cent), reinforcing the need for better material selection and construction techniques that prioritize comfort, support, and proper fit for postpartum women.

xiii. Suggestions for better maternity wear

Among the suggestions for improving maternity wear, offering more size variations was the most common recommendation, with 42.5 per cent of respondents suggesting this. Additionally, 27.5 per cent of women recommended offering adjustable designs to accommodate body fluctuations postpartum. Some women (15 per cent) suggested that maternity wear should include medical advice on garment support, indicating that partnerships with healthcare professionals could enhance the development of more supportive and functional maternity wear. This highlights the opportunity for greater collaboration between the fashion industry and medical professionals to create clothing that addresses the specific physical needs of postpartum women.



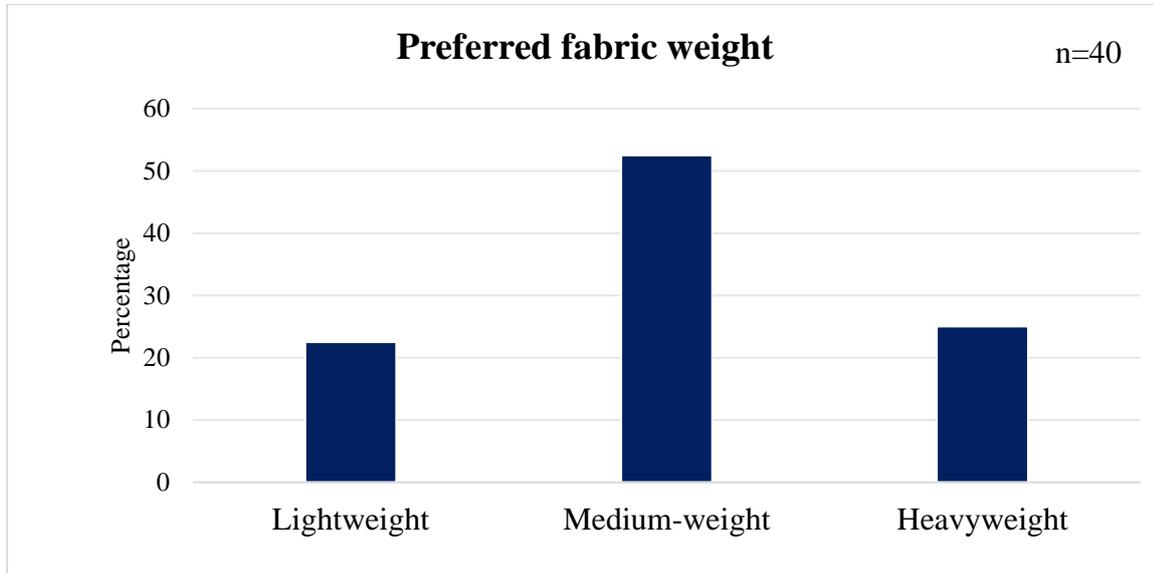
Graph 4.17: Percentage distribution of suggestion for better maternity wear

Among the proposed solutions, offering more size variations and adjustable designs was the most common recommendation. Adjustable designs accommodated body fluctuations postpartum, making them a practical choice. Some respondents suggested including medical advice on garment support, indicating that collaborations with healthcare professionals could have enhanced maternity wear development.

xiv. Fabric weight preferences

The majority of respondents (52.5 per cent) preferred medium-weight fabrics for maternity wear, reflecting a demand for a balance between comfort and durability in postpartum clothing. Lightweight fabrics were the next most popular choice (22.5 per

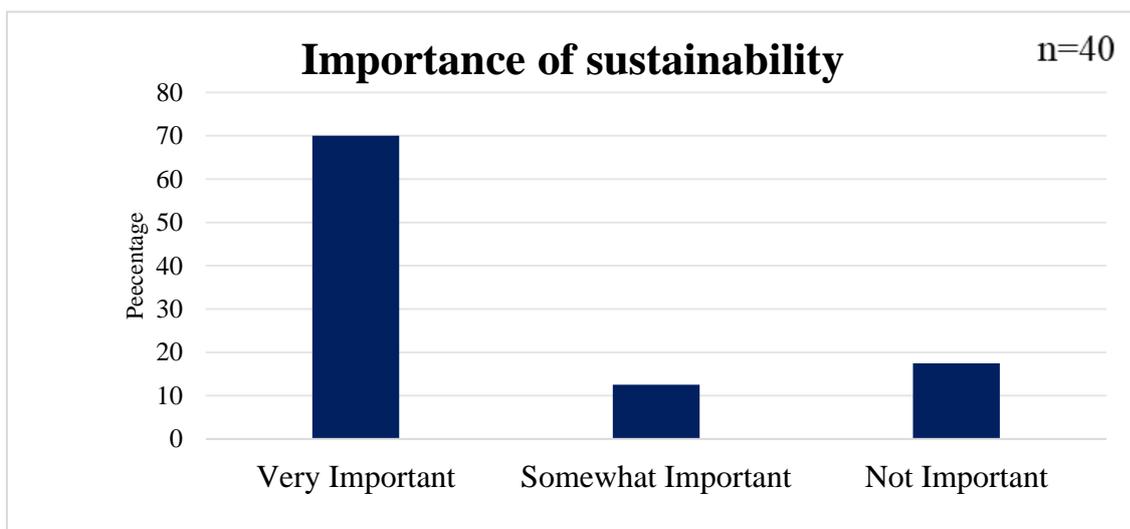
cent), especially among those prioritizing breathability and ease of movement. A smaller portion (25 per cent) favoured heavyweight fabrics, likely for their added warmth and structure.



Graph 4.18: Percentage distribution of fabric weight

These preferences indicate that postpartum women value fabrics that provide comfort for varying temperatures while ensuring durability and longevity. Based on these insights, khadi, known for its comfort, breathability, and sustainable nature, has been chosen for its medium-weight qualities, offering a perfect blend of comfort and durability for postpartum wear.

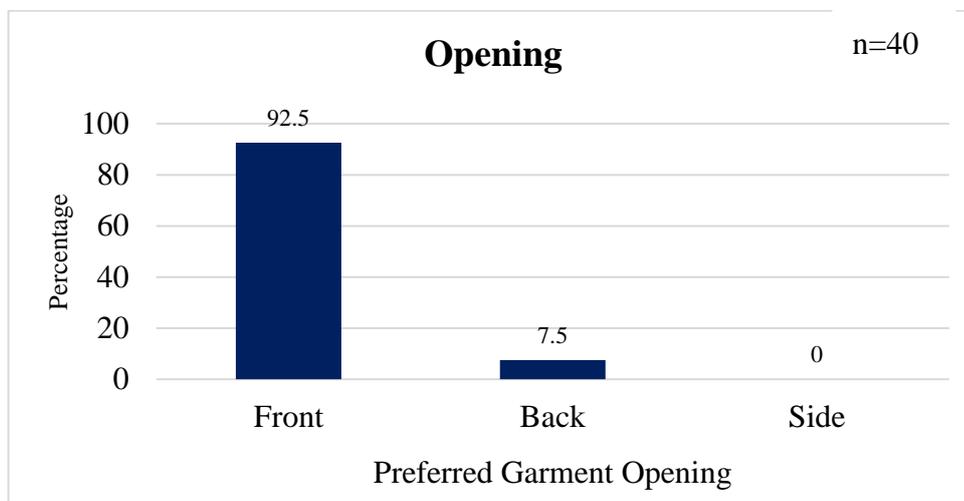
xv. Sustainability considerations



Graph 4.19: Percentage distribution of importance of sustainability

Sustainability was rated as "Very Important" by 70 per cent of respondents, reflecting a growing preference for eco-friendly, ethical, and durable fabrics in maternity wear. However, 12.5 per cent of respondents considered sustainability as "Somewhat Important," and 17.5 per cent deemed it "Not Important." This suggests that while sustainability is a crucial factor for many, other concerns such as affordability and comfort may take precedence for some. Despite these varying opinions, the overall trend indicates that many postpartum women are increasingly conscious of environmental impacts and are seeking maternity wear that aligns with sustainable and ethical practices.

xvi. Garment opening preferences



Graph 4.20: Percentage distribution of garment opening

A clear preference for front openings was observed among the respondents, with 92.5 per cent choosing this option. This preference aligns with the need for easy breastfeeding access and convenience in dressing. Only a small percentage (7.5 per cent) opted for back openings, indicating that functionality and accessibility are more important than aesthetics for most postpartum women when it comes to garment design. The strong preference for front openings highlights the practical needs of nursing mothers, suggesting that maternity wear should prioritize ease of use and accessibility.

4.1.1.c Demographic profile of healthcare provider

The study involved a total of 14 participants from two hospitals 7 from each hospital GMERS and SSG, with a mix of healthcare professionals and hospital staff. The participant group includes doctors, nurses, laundry workers, and OT helpers.

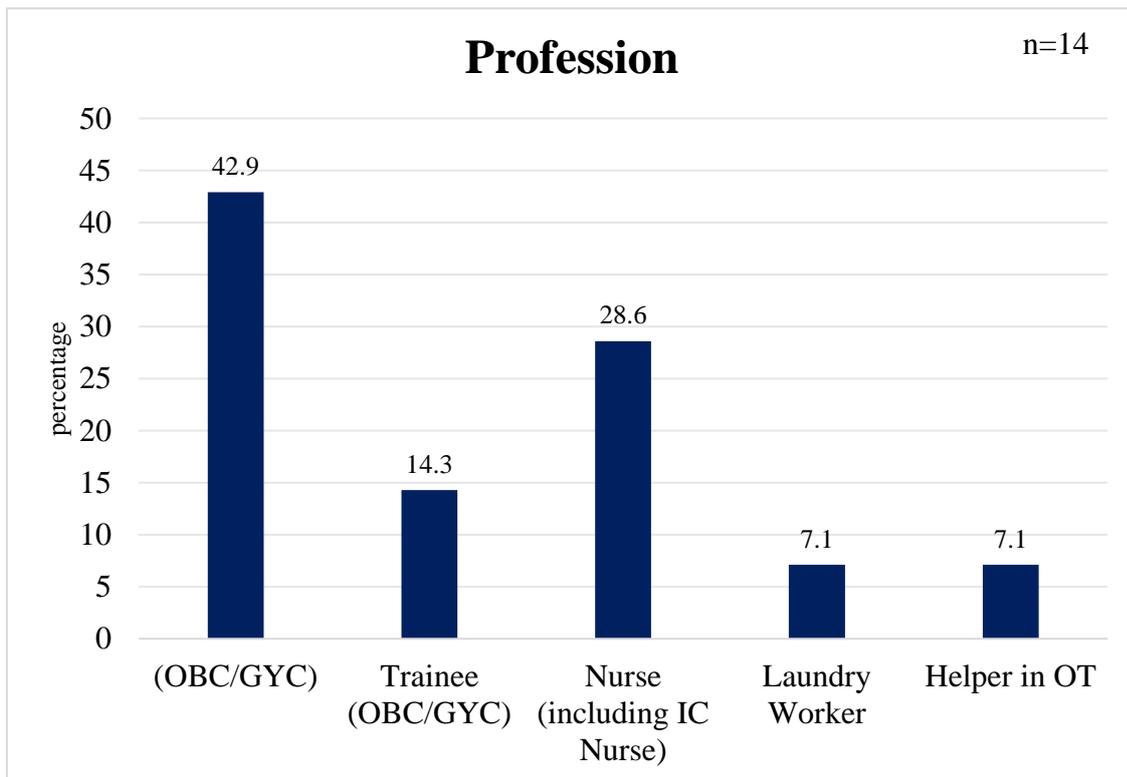
i. Gender

All participants were female, reflecting the hospital's staffing trends in specific departments like nursing and support staff.

ii. Years of experience

The experience of participants varied, with a majority having 1-7 years of experience, while some participants had significantly more experience. This diversity allowed for a broad range of insights regarding the hospital environment and the challenges faced in maternity wear design.

iii. Profession



Graph 4.21: Percentage distribution of healthcare professionals

A variety of professional backgrounds were represented, with most participants being from the OBC/GYC category, alongside others from nursing and housekeeping.

4.1.1.d Insights from healthcare providers

i. Admission frequency/day

Table 4.2: Admission frequency/day

Hospital	Admission frequency/day
SSG	25-30
GMERS	5-6

SSG hospital exhibited a substantially higher admission rate, ranging from 25 to 30 patients per day. In contrast, GMERS hospital recorded a significantly lower admission rate, with only 5 to 6 patients per day.

ii. Provision of maternity wear

Maternity wear is provided by all participating hospitals, but it is only available in the operating theatre (OT). This limited provision suggests that while the hospitals recognize the importance of maternity wear, it is not yet an established practice to provide this essential garment for postpartum care. The lack of provision outside the OT could be due to budget constraints, lack of demand, or other logistical challenges.



Current OT gown of SSG



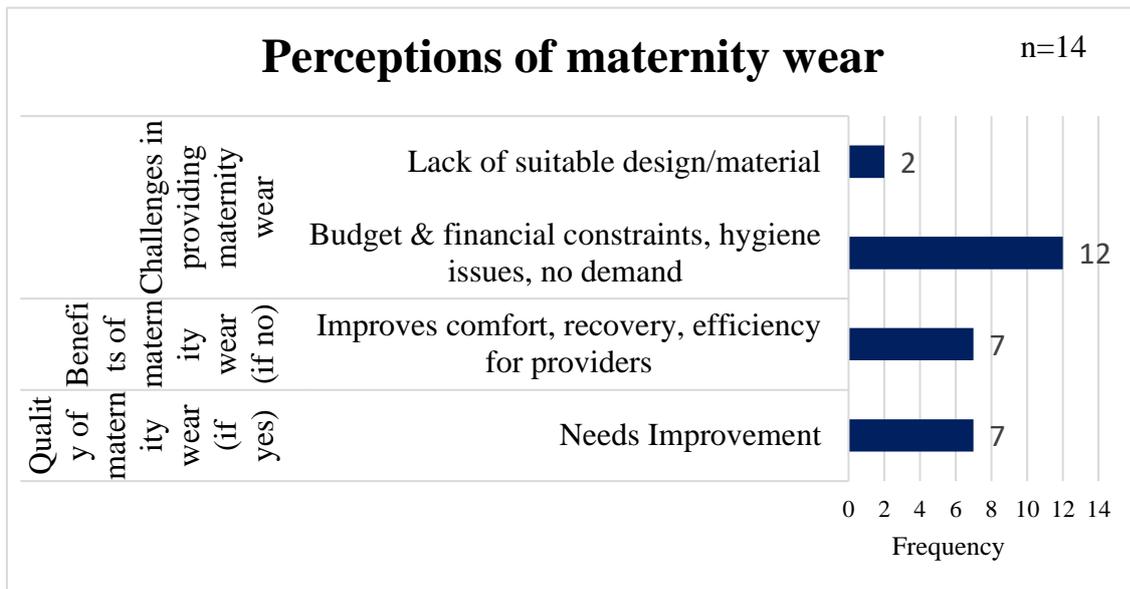
Current OT garment in SSG: shirt



Current OT garment of SSG: petticoat

Plate 4.1: Current OT gown of hospitals

iii. Perceptions of maternity wear



Graph 4.22: Perceptions of maternity wear: benefits vs. challenges in provision

Quality of maternity wear

Despite the provision of maternity wear in the OT, none of the participants rated the quality of the garments positively, with all hospitals indicating that the quality needs improvement. This feedback highlights that the existing maternity wear does not meet the standards for comfort, hygiene, or durability expected for postpartum recovery. The poor quality of maternity wear can potentially hinder the recovery process, as the garments may not be able to withstand the challenges of daily wear and frequent washing.

Benefits of maternity wear

The general consensus among participants was that maternity wear could greatly improve comfort and recovery for postpartum women. It was noted that appropriate garments would not only enhance patient comfort but also make the care process more efficient for healthcare providers. The ability of postpartum women to wear comfortable, easy-to-maintain garments would support better healing and reduce the stress associated with inappropriate clothing during recovery.

Challenges in providing maternity wear

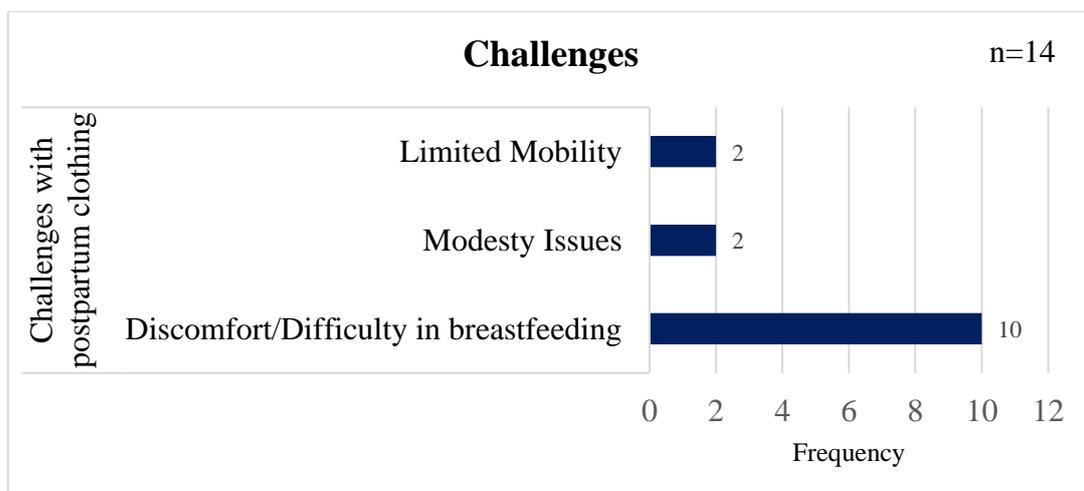
The most common challenges reported by participants include budget and financial constraints, difficulty managing hygiene and cleaning, and the lack of demand from patients. Hospitals appear to be constrained by budget limitations that prevent them from providing adequate maternity wear for postpartum women. Furthermore, managing the hygiene of maternity wear, particularly in the face of frequent blood stains, poses another challenge. Additionally, the perceived lack of demand from patients could reflect a gap in awareness about the importance of appropriate postpartum garments or the inability of women to afford or request better clothing options.

For SSG Hospital, additional challenges were cited, including the lack of suitable design or material to meet the specific needs of postpartum women. This reinforces the need for improved design solutions that prioritize both comfort and functionality.

iv. Frequency of interaction with new mothers

All healthcare providers and hospital staff interacted with new mothers on a daily basis, ensuring consistent observation of their needs, including comfort with maternity wear. This frequent interaction provides valuable opportunities for healthcare providers to directly assess the impact of current maternity wear on recovery and comfort.

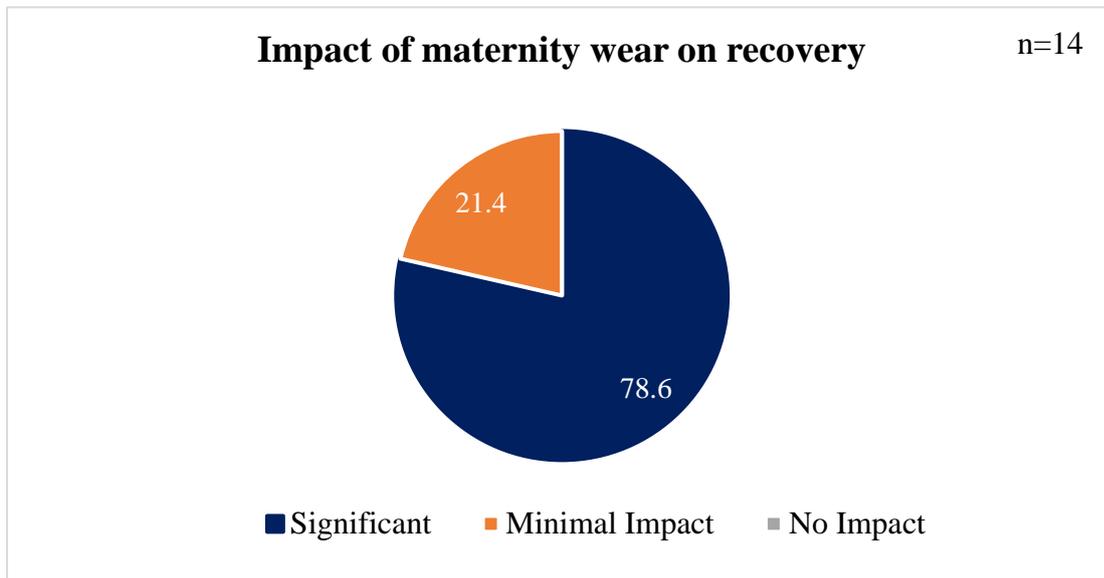
v. Challenges with postpartum clothing



Graph 4.23: Challenges with postpartum clothing

The most commonly reported issues with current maternity wear were discomfort and difficulty breastfeeding. Some participants also highlighted concerns related to modesty, particularly in cases where garments did not adequately cover the body in a culturally sensitive way. These findings underscore the need for maternity wear that accommodates both medical needs and cultural preferences, making it easier for women to breastfeed and feel comfortable. At SSG Hospital, some participants also mentioned limited mobility as an additional challenge with the current maternity wear. This points to a gap in garment design that restricts movement and makes it difficult for women to perform basic activities during the postpartum period.

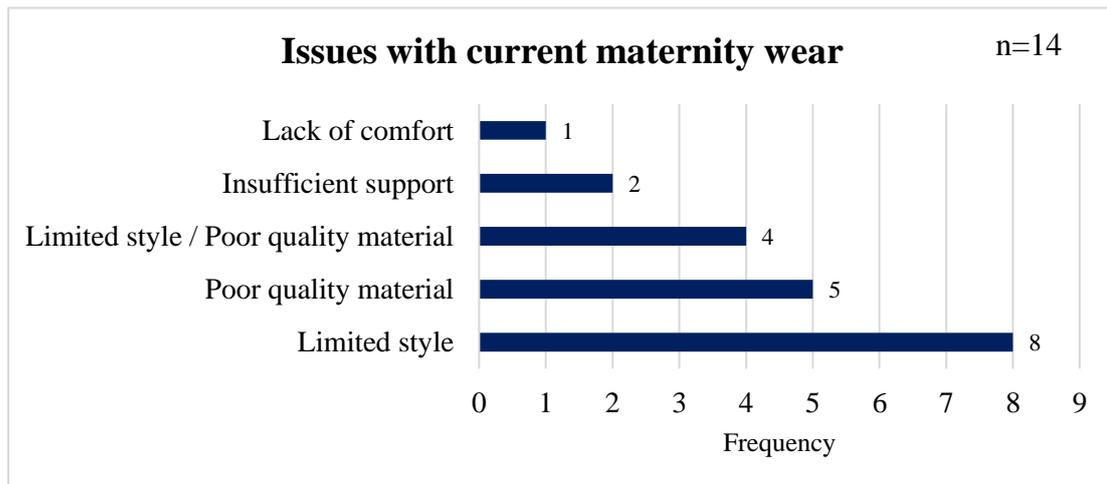
vi. **Impact of maternity wear on recovery**



Graph 4.24: Impact on maternity wear on recovery

The survey results indicated that the majority of respondents (71.4 per cent) felt that maternity wear was somewhat effective in aiding postpartum recovery. This suggests that while the clothing provided some level of comfort and support, it may not have fully met all the needs of postpartum women. A smaller portion (28.6 per cent) felt that their maternity wear was effective in supporting their recovery, indicating that for some women, the right clothing did contribute positively to their postpartum experience. However, none of the participants reported that their maternity wear was ineffective, pointing to a generally positive response, but also highlighting room for improvement in terms of comfort, support, and functionality to better facilitate recovery during the postpartum period.

vii. Issues with current maternity wear



Graph 4.25: Issues with current maternity wear faced by postpartum women

The data revealed several challenges postpartum women face when selecting maternity wear. The most common issue, affecting 42.9 per cent of respondents, was the limited style and poor quality of materials. This suggests that many women feel restricted in their clothing options and are dissatisfied with the durability and texture of available maternity garments. A significant portion (35.7 per cent) also reported a limited selection of styles, indicating a gap in the market for fashionable yet functional maternity wear. Additionally, 14.3 per cent of women found that maternity wear did not provide sufficient support, emphasizing the need for garments that offer both comfort and structural support. Lastly, 7.1 per cent of respondents cited a lack of comfort along with limited style options, further underlining the importance of designing maternity wear that prioritizes both aesthetic appeal and practical comfort. These findings highlight the need for maternity wear that not only addresses functional needs but also offers variety, quality, and support.

viii. Laundering methods for maternity wear

The laundering of maternity wear in hospitals followed a multi-step process to ensure cleanliness. Across all hospitals, maternity garments, especially those with blood stains, were first hand-washed before being sent to an external laundry service (dhobi) for further cleaning.

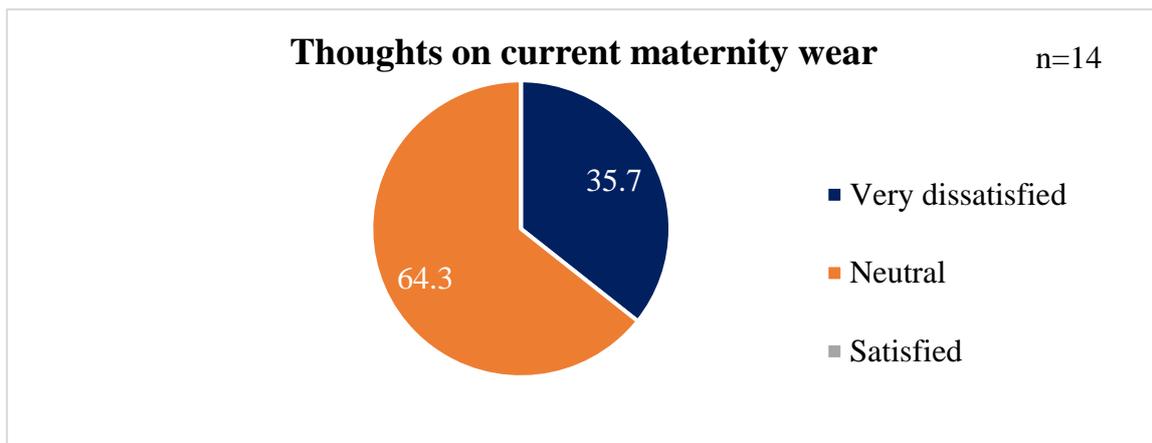
Operating theatre (OT) clothes underwent a pre-treatment process where they were rinsed with water and treated with sodium hypochlorite (bleach) to aid in blood stain removal.

While these methods aimed to maintain hygiene, the reliance on external laundry services raised concerns about infection control and garment durability.

ix. Frequency of laundering

All respondents indicated that they launder maternity wear (OT gown) after every use.

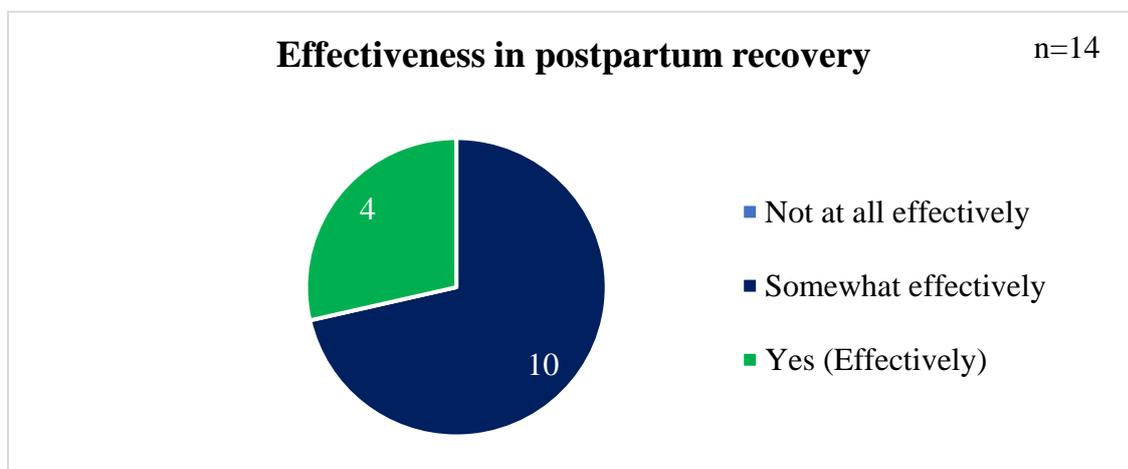
x. Thoughts on current maternity wear



Graph 4.26: Satisfaction level with current maternity wear

The data revealed that 35.7 per cent of respondents were very dissatisfied with the maternity wear they used in hospitals, while 64.3 per cent remained neutral. Notably, none were satisfied, indicating a need for improvements in comfort, functionality, and suitability for postpartum use.

xi. Effectiveness in postpartum recovery



Graph 4.27: Effectiveness in postpartum recovery

In terms of recovery, 78.57 per cent of respondents felt that their current maternity wear was somewhat effective, while 21.43 per cent found it to be fully effective in aiding their recovery. However, it is clear that the wear could be improved to better support recovery, especially after C-section deliveries. The current garments provide basic support but are not fully optimized for recovery, particularly for women who have undergone C-sections.

xii. Issues with maternity wear



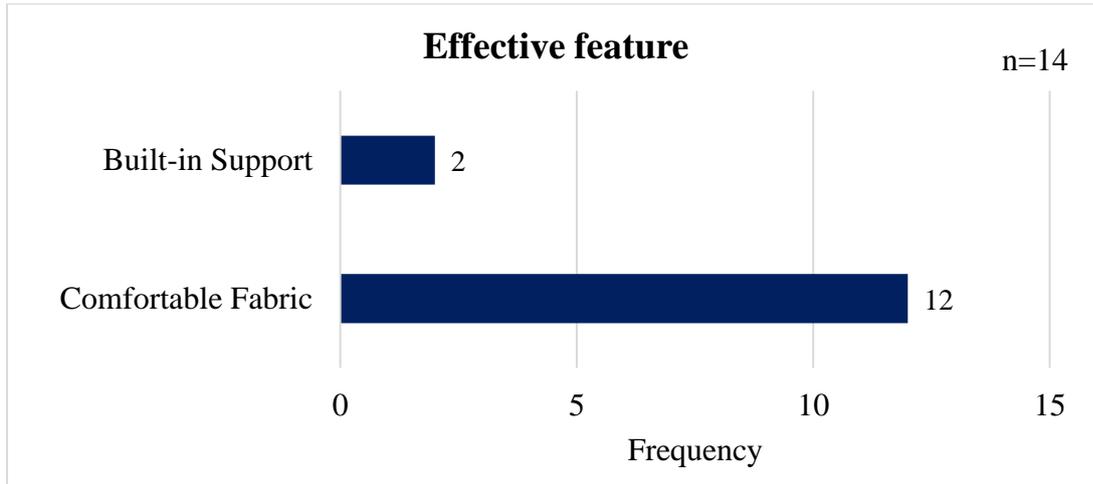
Graph 4.28: Issues with maternity wear

The study found that 50 per cent of participants reported concerns regarding poor-quality materials, while 35.71 per cent highlighted insufficient support, and 7.14 per cent mentioned lack of comfort. These findings suggest that while maternity wear serves its functional purpose, it often falls short in meeting the physical and aesthetic needs of postpartum women. There is a clear need for maternity clothing that prioritizes comfort, support, and style, ensuring both functionality and high-quality design. Manufacturers should focus on using soft, breathable, and durable fabrics to enhance the overall maternity wear experience.

xiii. Maternity wear features: effective and ineffective

1. Effective features

The most appreciated feature of maternity wear was comfortable fabric, with 92.86 per cent of respondents emphasizing its importance. Other valued features included built-in support, recognized by 21.43 per cent of respondents.

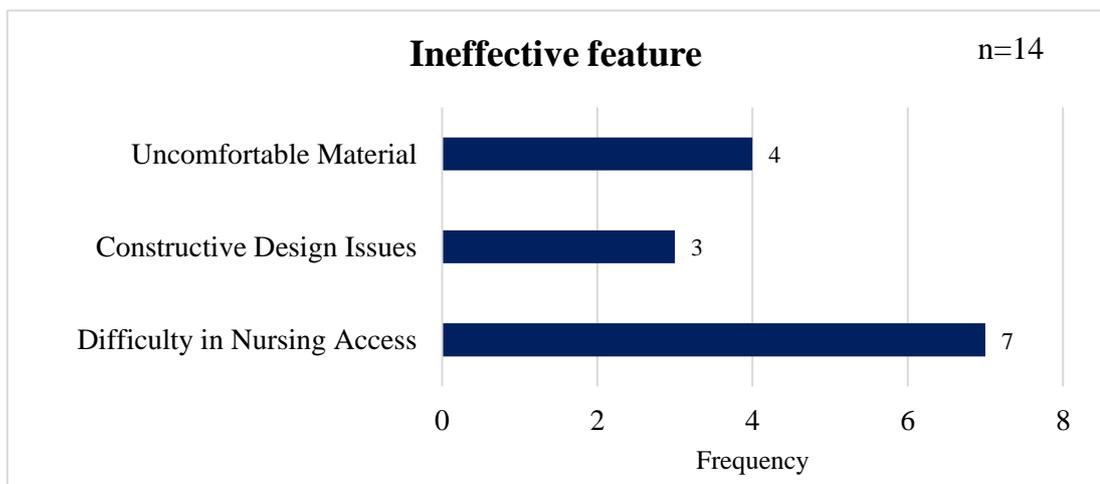


Graph 4.29: Effective feature in maternity wear

Comfort emerged as a dominant preference, which is understandable given the physical discomfort postpartum women experience. Maternity wear should prioritize soft, breathable, and gentle fabrics to enhance overall comfort. Additionally, while built-in support was acknowledged as beneficial, it is not commonly found in current designs, highlighting an opportunity for innovation in this area.

2. Ineffective features

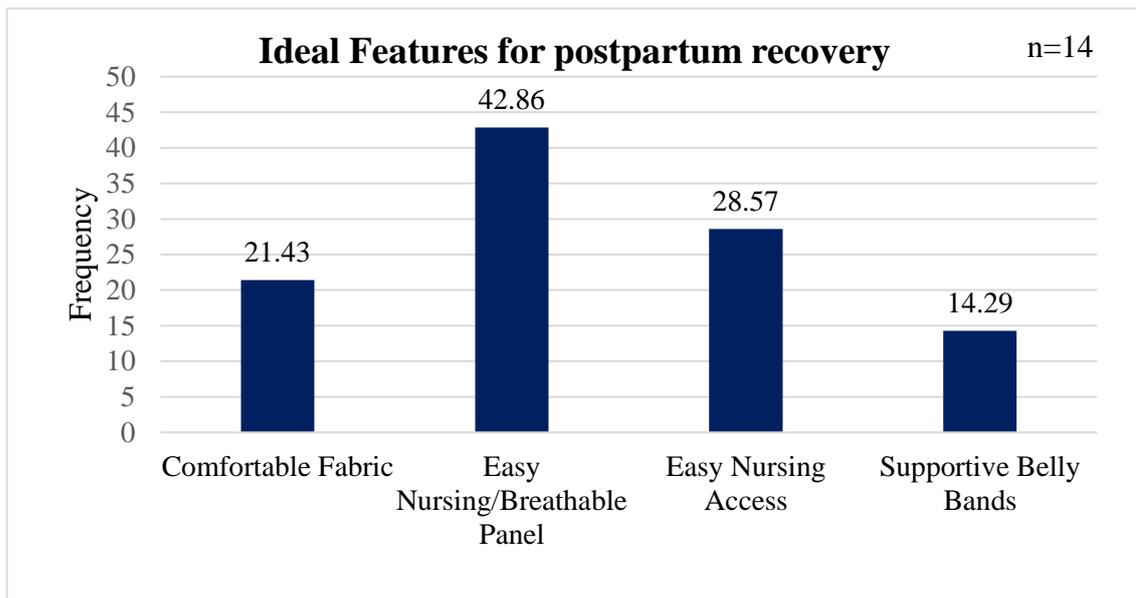
The survey revealed several ineffective features of maternity wear, with the most significant issue being difficulty in nursing access, which affected 50.00 per cent of respondents. This indicates that many postpartum women struggled to find garments that provided convenient and easy access for breastfeeding, highlighting the need for better-designed nursing openings in maternity wear.



Graph 4.30: Ineffective feature in maternity wear

Constructive design issues were also reported by 21.43 per cent of respondents, pointing to problems such as ill-fitting or poorly constructed garments that did not support the changing postpartum body effectively. Additionally, 28.57 per cent of respondents cited uncomfortable material as an issue, suggesting that the fabric used in some maternity wear was not suitable for extended wear or comfort. These findings emphasize the importance of designing maternity wear that is both functional and comfortable, with improved nursing access, better construction, and more suitable materials.

xiv. Ideal features for postpartum recovery



Graph 4.31: Ideal features for postpartum recovery

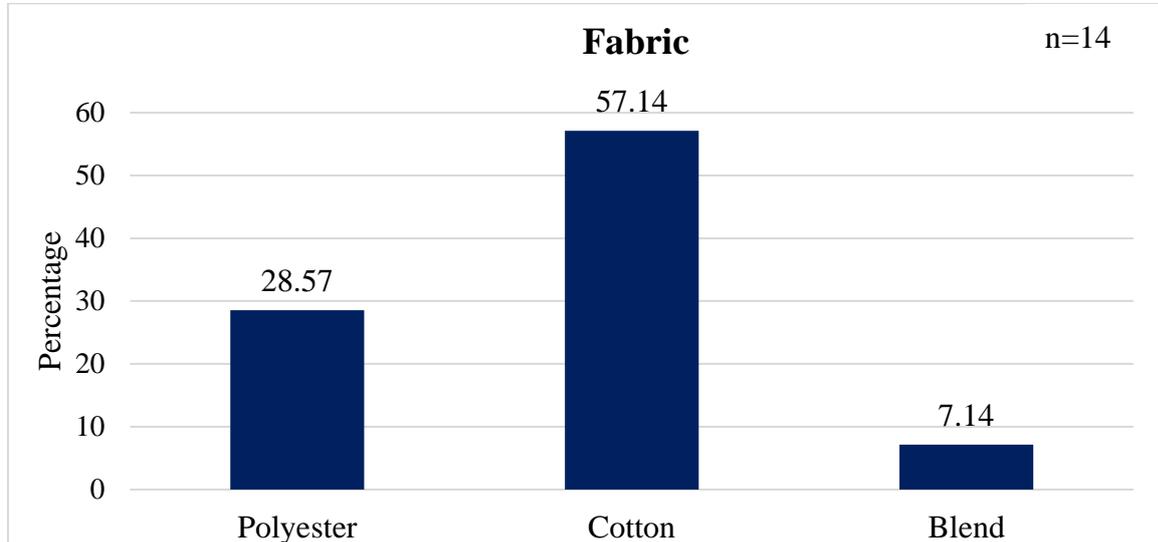
The highlighted the ideal features preferred for postpartum recovery among 14 respondents. The most desired feature was an easy nursing or breathable panel, with 42.86 per cent of respondents prioritizing it. Easy nursing access was also significant, as 28.57 per cent of respondents considered it important. Comfortable fabric was preferred by 21.43 per cent of participants, highlighting the need for soft and soothing materials. Additionally, 14.29 per cent of respondents emphasized the importance of supportive belly bands for postpartum support. These findings indicated that functionality, breathability, and accessibility were key considerations in designing maternity wear for postpartum mothers.

xv. Importance of comfort, support, and practicality

All respondents (100 per cent) considered comfort, support, and practicality to be very important in postpartum maternity wear. Maternity wear must be designed to facilitate

mobility, provide physical support, and offer comfort throughout the recovery process. This reinforces the need for designs that are both functional and comfortable.

xvi. Fabric preferences



Graph 4.31: Ideal features for postpartum recovery

A majority of respondents (78.57 per cent) preferred cotton for maternity wear, while 14.29 per cent favoured polyester, and 7.14 per cent preferred a blend. Cotton is clearly the preferred material due to its comfort, breathability, and softness, which are essential for postpartum wear. However, the use of polyester and blends indicates that there is a desire for garments that are also durable and easy to maintain, particularly in hospital environments where frequent washing is necessary.

xvii. Impact on patient satisfaction and re-admissions

A strong majority 100 per cent agreed that maternity wear has a positive impact on patient satisfaction and reduces re-admissions. High-quality maternity wear can improve the overall postpartum experience, contributing to better recovery and satisfaction. This can lead to fewer complications and, consequently, fewer hospital re-admissions. This highlights the importance of investing in better maternity wear that can aid recovery and improve patient outcomes.

xviii. Special considerations for postpartum wear design

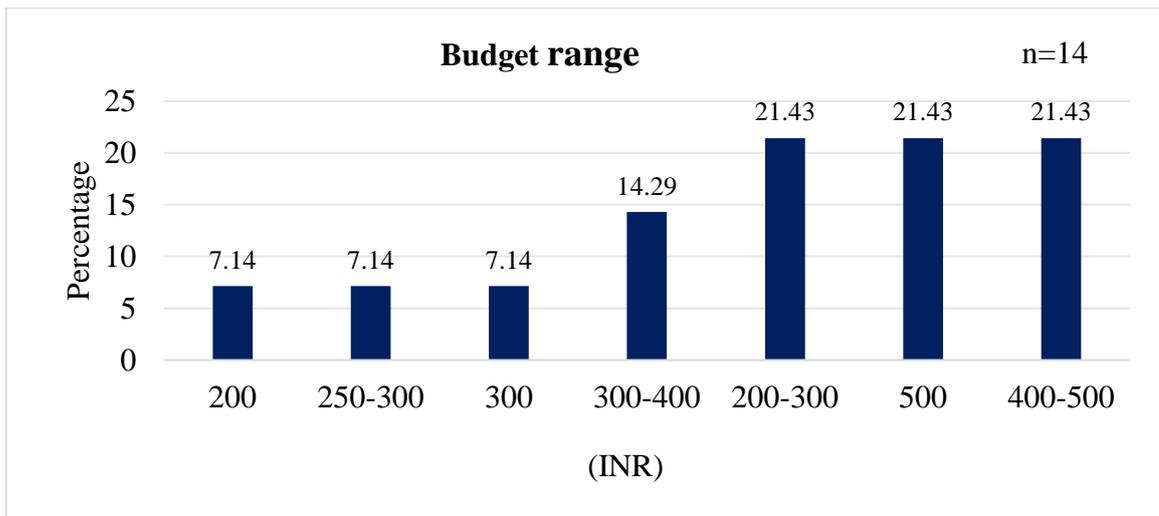
Respondents highlighted the following key considerations for design

- C-section recovery and breastfeeding support were emphasized by 71.43 per cent.

- Mobility issues were also a concern for 42.86 per cent of respondents.

The variety of recovery experiences among postpartum women—ranging from C-sections to vaginal deliveries—suggests that maternity wear must be versatile and adaptive. Special design features like breathable fabrics, and discreet nursing access are necessary to cater to different recovery needs.

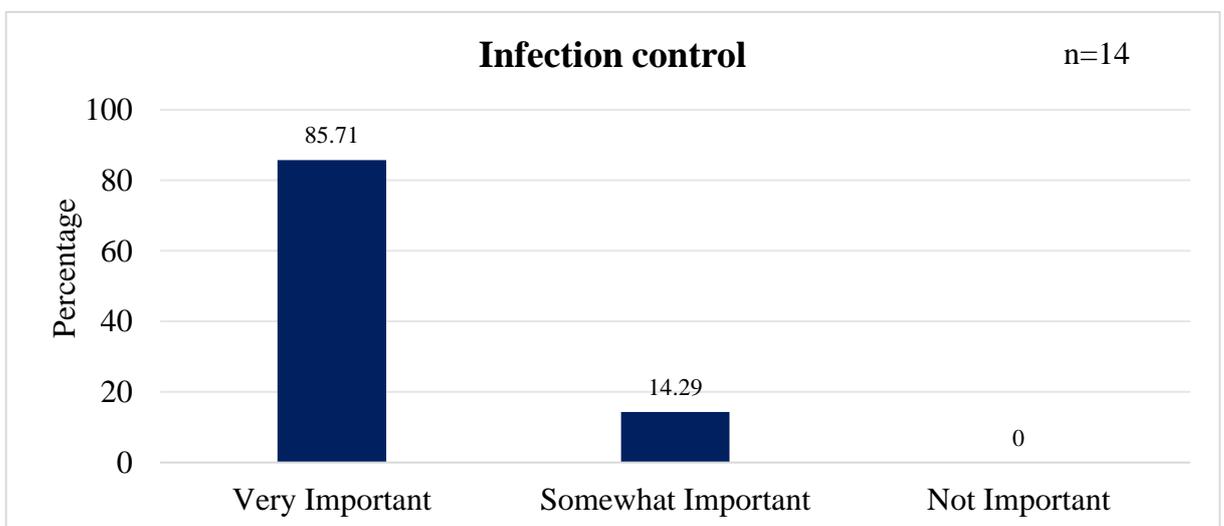
xix. Budget constraints for design consideration



Graph 4.33: Budget constraint for design consideration

Respondents indicated that their budget for maternity wear typically ranged from 200–300 INR. Additionally, most responses fall between 200-500 INR, with 500 INR and 200-300 INR being the most common budgets.

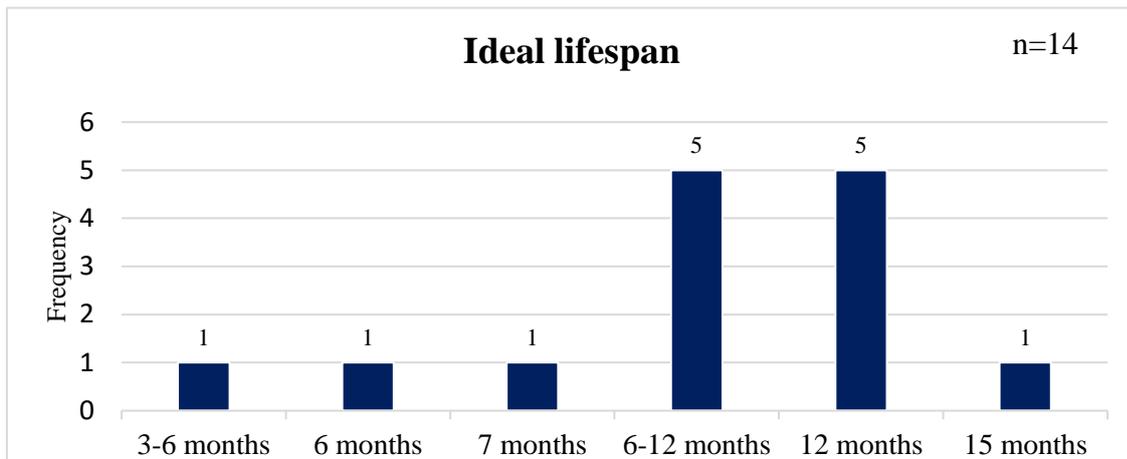
xx. Importance of infection control



Graph 4.34: Importance of infection control

Majority (85.71 per cent) of respondents considered maternity wear features as very important, highlighting the necessity of comfortable, accessible, and functional clothing during the postpartum period. A small portion (14.29 per cent) found them somewhat important, indicating some level of flexibility in preferences. At the same time, infection control is crucial, particularly in healthcare settings, where hygiene is a priority. Designers should consider using antimicrobial fabrics and ensure that the garments are easy to clean.

xxi. Ideal lifespan of maternity wear



Graph 4.35: Ideal lifespan of maternity wear

The majority of respondents preferred a lifespan of 6–12 months for maternity wear (78.57 per cent). Maternity wear is often used only during the postpartum recovery period. As such, the ideal lifespan of garments should match this temporary need while being durable enough to withstand frequent laundering

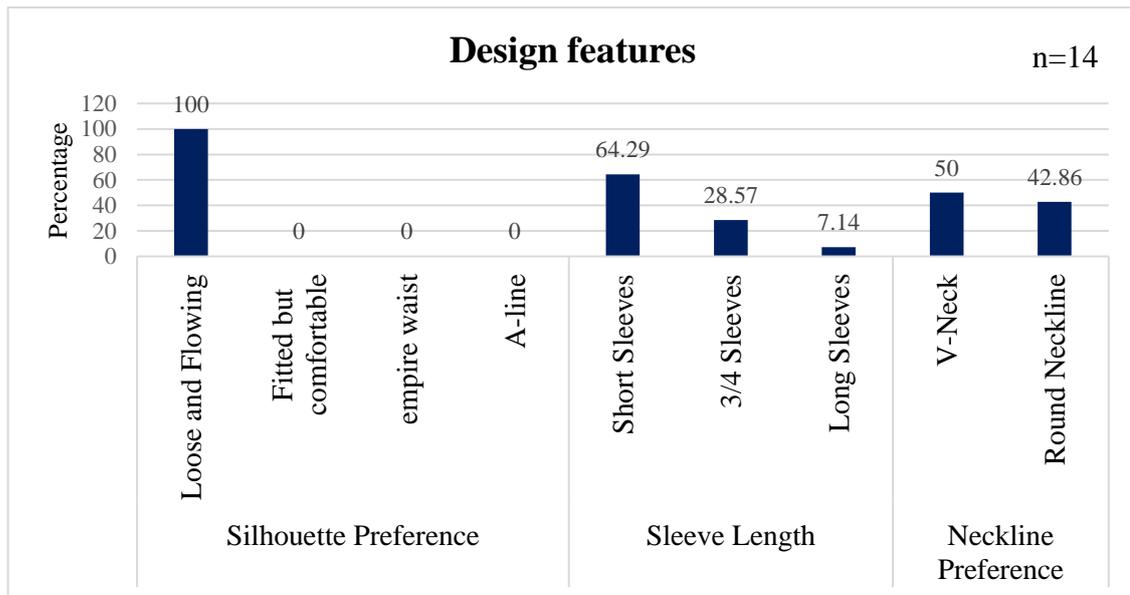
xxii. Importance of sustainable materials

The overwhelming consensus (100 per cent) on the importance of sustainable materials reflects the growing awareness and concern for environmental sustainability. Postpartum women are likely to prefer fabrics that not only benefit their well-being but also align with a broader eco-conscious approach. This result highlights the increasing need for brands to adopt sustainable fabric sourcing practices in maternity wear.

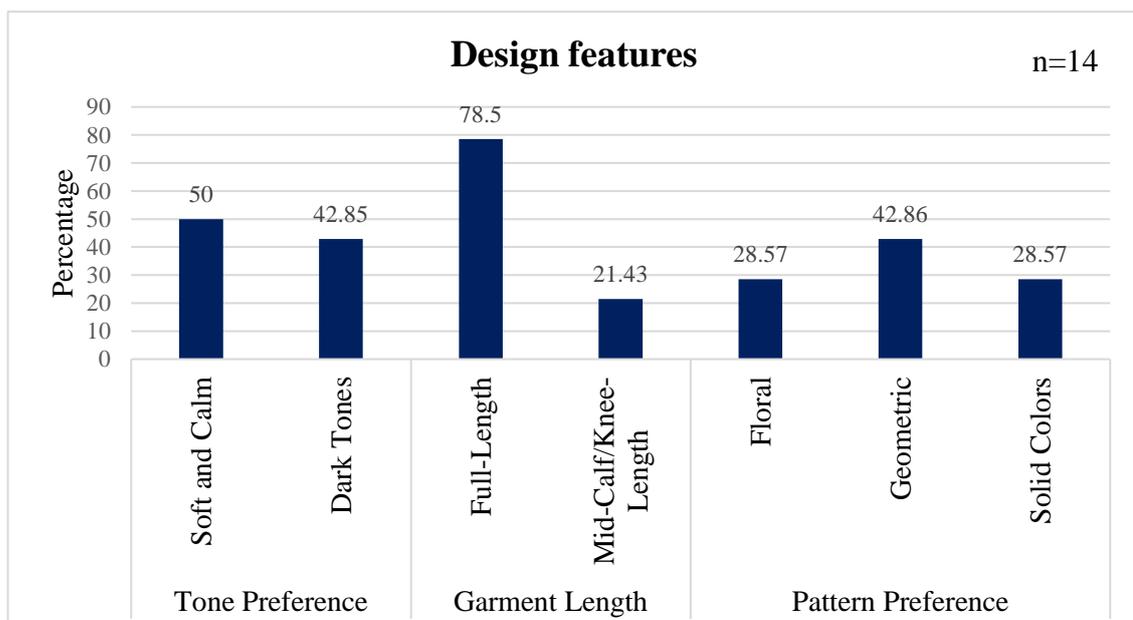
xxiii. Design Preference

The unanimous preference for a loose and flowing silhouette (100 per cent) highlights the need for comfort and flexibility in postpartum wear, accommodating physical

recovery and body changes. Short sleeves (64.29 per cent) were the most preferred for breathability and ease of movement, while 3/4 sleeves (28.57 per cent) provided moderate coverage, and long sleeves (7.14 per cent) catered to warmth or modesty. For neckline styles, V-neck (50 per cent) was the top choice, likely due to breastfeeding accessibility, followed by round necklines (42.86 per cent), which offer a classic, modest look.



Graph 4.36a: Percentage distribution of preference regarding design features: Silhouette, Sleeve style and Neckline



Graph 4.36b: Percentage distribution preference regarding design features: Silhouette, Sleeve style and Neckline

Soft and calm tones (50 per cent) were the most favoured, reflecting a need for soothing aesthetics, while dark tones (42.86 per cent) were also popular for their practicality.

Full-length garments (78.57 per cent) were highly preferred for coverage and warmth, whereas mid-calf and knee-length options (21.43 per cent) suited those seeking ease of movement.

Pattern- Floral patterns (28.57 per cent) were the most liked, though geometric (42.86 per cent) and solid colors (28.57 per cent) also had strong appeal, indicating varied aesthetic preferences among postpartum women.

xxiv. Features desired in maternity wear for patients

Easy breastfeeding access was highly sought after, with 50 percent of respondents emphasizing the need for garments that facilitate this process. Additionally, stain resistance and easy cleaning, each preferred by 21.43 percent of respondents, were considered essential due to the frequent spills, stains, and bodily fluids postpartum women encounter. Functional features such as buttons and zippers were also appreciated for their convenience in managing breastfeeding.

xxv. Recommended existing designs or products

None of the respondents recommended existing maternity wear products, suggesting that current options may not fully meet postpartum women's expectations and needs. This highlights a significant opportunity for designers and manufacturers to create innovative maternity wear that addresses these gaps.

xxvi. Color code for maternity wear in hospitals

The use of pink and blue as maternity wear colors codes was prevalent in 71.43 percent of hospitals, reflecting traditional gender associations. However, the increasing adoption of neutral tones like green, dark blue, and maroon suggests a shift towards more inclusive and diverse preferences, moving away from gender-specific colors in some hospitals.

xxvii. Additional budget considerations for design

Budget preferences indicated that most respondents were comfortable within the 200-500 range, with a higher concentration around 200-300. This suggests that postpartum women seek affordable yet high-quality maternity wear that meets their functional needs

without exceeding their budgets. The responses highlight affordability as a key consideration in maternity wear design.

4.1.2 Market survey observations

The market survey conducted in Vadodara focused on postpartum wear available both in online brand shops and local vendors. Locations for the survey included established brand shops such as Mothercare, Max Fashion, and Lifestyle, alongside local vendors in Mangal Bazaar, SSG Hospital Store, and Jubilee Baug Garden. The survey aimed to explore garment availability, price range, and fabric options in postpartum wear.

i. Garment availability:

1. Nightgowns: Available in cotton and polyester blends. Found at Mothercare, Max Fashion, and local vendors in Mangal Bazaar and Jubilee Baug. These garments are suitable for postpartum women due to their comfort and easy maintenance.
2. Nursing Tops: Available in cotton/polyester blends, designed for easy breastfeeding access. Commonly found in brand shops like Mothercare, Lifestyle and Max Fashion, as well as local vendors.
3. Loungewear/Leggings: These garments are made from comfortable cotton/polyester blends and are available at both brand shops and local vendors.
4. Compression Wear: Primarily made of nylon or polyester, offering postpartum support, available at all locations.

ii. Price range and fabric options

The survey revealed that Vadodara's offline market offers a broad spectrum of postpartum wear, from premium brands to budget-friendly local options. The price range varies from ₹250 to ₹2,000, with local vendors offering garments at more affordable prices compared to online branded stores. Comfort, breathability, and easy nursing access were the key factors that shaped the garment offerings in the market.

iii. Local vendors

Mangal Bazaar, SSG Hospital Store, and Jubilee Baug Garden, Nava bazar, feature a variety of postpartum wear options at lower price points, typically ranging from ₹250 to ₹700. The fabrics include cotton, nylon and polyester blends, offering budget-friendly alternatives to premium brands. Provide budget-friendly alternatives, predominantly made from cotton and polyester blends, ensuring comfort at a lower cost

Table 4.3: Price comparison of nightgowns in Vadodara local markets

Local Market	Mangal bazar (₹)	Nava bazar (₹)	Jubilee Baug (₹)	Near SSG hospital (₹)
Nylon Nightgown	150	200	200	100
Cotton and Cotton/Polyester Nightgown	300-500	400-700	200-700	250



Near SSG hospital



Jubeli Baug



Mangal bazar

Plate 4.2: Local market

iv. Online brand shop

Postpartum wear played a crucial role in providing comfort, support, and functionality for new mothers during the recovery period. Several online brands offered a variety of maternity and postpartum clothing, differing in price and quality. This study compared the pricing of essential postpartum garments, including nightgowns, nursing tops, loungewear, and compression wear, across three well-known brands—Mothercare, Max Fashion, and Lifestyle.

1. Mothercare: Known for premium postpartum wear, offering nightgowns, nursing tops, and compression wear at higher price points.
2. Max Fashion: Offers budget-friendly nursing tops and leggings, catering to postpartum comfort needs.
3. Lifestyle: Known for offering affordable loungewear and compression garments for postpartum recovery.

Table 4.4: Price comparison of nightgowns in online brand shop

Category	Mothercare (₹)	Max Fashion (₹)	Lifestyle (₹)
Nightgowns	1,000 - 1,500	500 - 900	800 - 1,200
Nursing Tops	800 - 1,200	500 - 800	700 - 1,000
Loungewear/Leggings	800 - 1,500	500 - 1,000	700 - 1,200
Compression Garments	1,500 - 2,000	800 - 1,200	1,200- 1,800

Online Brand shop



Mothercare

Image source: <https://www.mothercare.in>



Life style

Image source: <https://www.lifestylestores.com>



Max Fashion

Image source: <https://www.maxfashion.in>

Plate 4.3: Online brands Shop

4.1.3 Additional Field Observations

1. Provision of Shishu Kits in SSG and GMERS hospitals

At both SSG and GMERS hospitals, all respondents confirmed that postpartum women receive a Shishu Kit provided by the United Way Foundation. These kits contain essential postnatal care items, including:

- A nightgown for the mother
- Baby's clothes
- Sanitary pads
- A baby wrap towel
- Baby care essentials
- An awareness leaflet on pre- and post-delivery precautions

These kits serve as an essential support system for new mothers, offering both necessary supplies and educational materials. Women typically use these items after being discharged, highlighting their practical significance in postnatal care.

Livelihood generation through the Udaan program

In addition to benefiting postpartum women, the Shishu Kit initiative also supports differently-abled individuals through the Udaan Livelihood Program. The kits distributed at SSG and GMERS hospitals are prepared by differently-abled students from the Special Education Centre in Vadodara, who are trained in:

- Assembling and packaging the kits
- Laminating Information, Education, and Communication (IEC) materials
- Managing inventory and facilitating kit distribution to hospitals

Through this initiative, students earn ₹55 INR per Shishu Kit, helping them gain financial independence, skill development, and employment opportunities.

Impact and significance

Since all respondents at SSG and GMERS hospitals confirmed the distribution of Shishu Kits, it highlights the widespread reach and impact of this initiative. The program serves a dual purpose:

1. Supporting Postpartum Women and Newborns – Ensuring they receive essential care products for comfort, hygiene, and well-being.

2. Empowering Differently-abled Individuals – Providing training, livelihood opportunities, and financial support through a structured employment program. By integrating maternal health support with inclusive employment, this initiative demonstrates a sustainable and socially responsible model that benefits both healthcare and economic empowerment.



Plate:4.4: Shishu kit project

Image source- <https://images.app.goo.gl/tYWbbiZU1yqXGvgt5>



Nightgown provided by the Shishu kit project



Baby products in the Shishu Kit

Plate:4.5: Shishu kit Content items

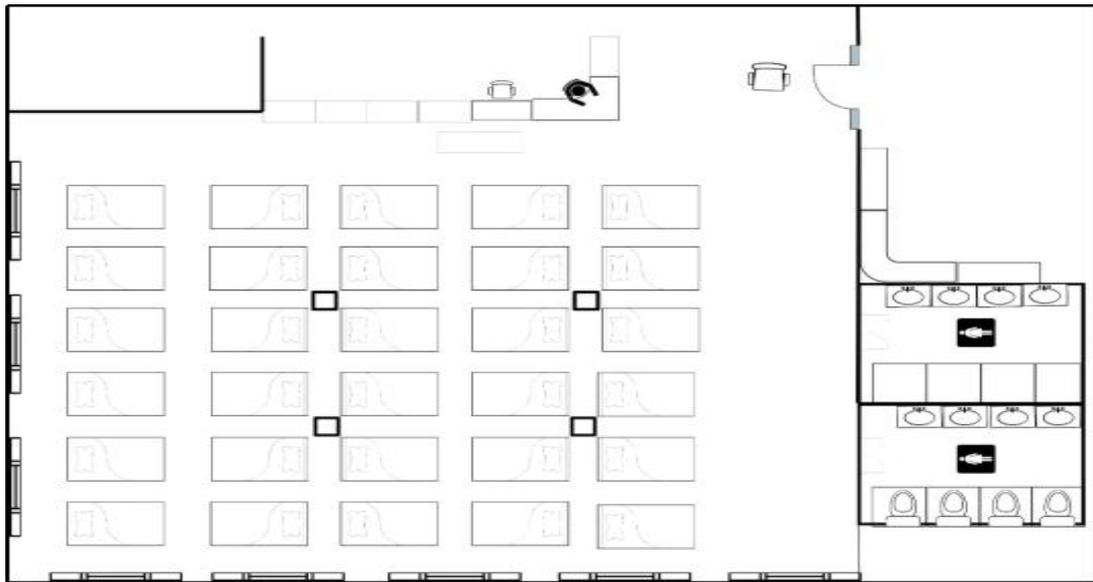
Floor layout of hospital ward

- The Obstetrics and Gynecology (O and G) department at SSG Hospital has a total of 6 wards: Ward 9A, Ward 9B, Ward 10, Ward 10A, Ward 10B, Ward 11. While the exact number of beds for the O and G department isn't explicitly mentioned in the available data, the Smt. Rukmini Chainani Prasuti Gruh, which provides obstetric services, has 184 beds across four floors.
- SSG hospitals have wards with room capacities ranging from 8 patients to 4 patients, depending on the ward's setup.
- GMERS Hospital has 3 wards dedicated to obstetric and gynaecological care, with a total of 90 beds, accommodating around 5-6 patients daily.

Table 4.5: Hospital Ward and Bed Statistics

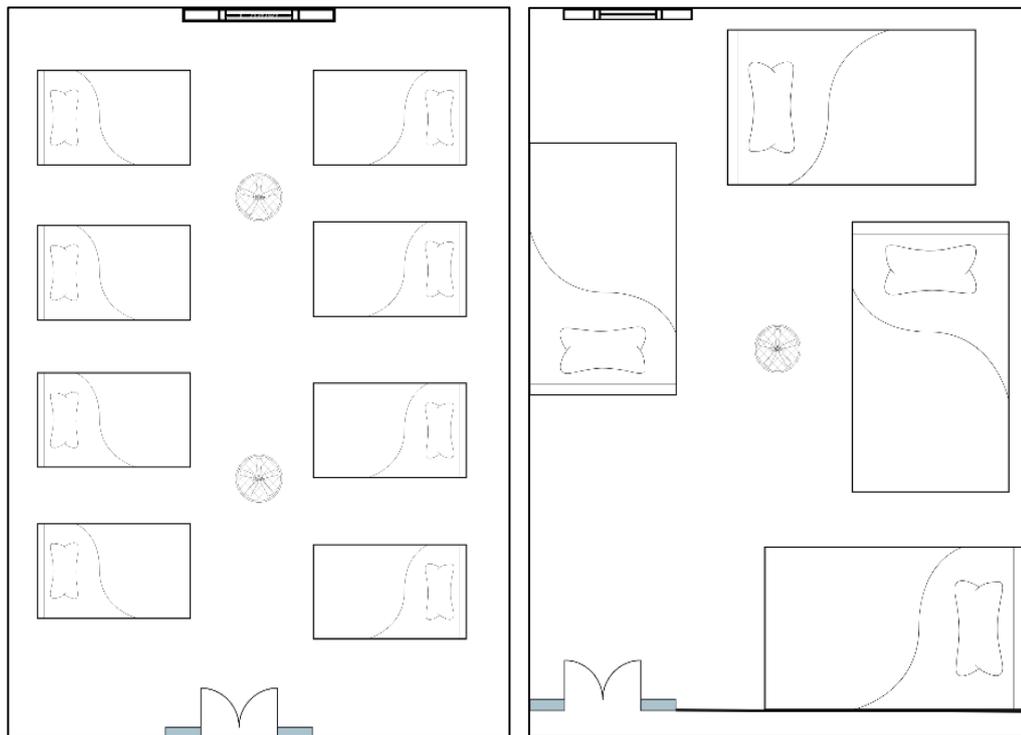
Hospital Name	Total Wards	ICU Beds	Total Beds in Wards
SSG	10	8	184
GMERS	3	30	90

Ward Floor layout of GEMERS



Ward floor layout of GEMERS (Created by researcher in Canva)

Ward Floor layout of SSG



Ward floor layout of SSG

Ward floor layout of SSG

(Created by researcher in Canva)

Plate:4.6: Ward floor layout

4.2. Design solutions and development of postpartum maternity wear

4.2.1. Creation of user personas

User personas were developed based on data collected from postpartum women and healthcare providers. These personas represented different categories of postpartum women, such as first-time mothers, women recovering from C-sections, and those experiencing mobility issues. By analysing their specific needs, preferences, and challenges, the design process was guided towards solutions that ensured comfort, accessibility, and functionality.

Postpartum woman persona in a public healthcare hospital- Based on patients in government hospitals of Vadodara – SSG and GMERS Hospital.

i. User profile

Table 4.6: User profile

Demographic Information	
Category	Details
Age	17-45 years
Hospital	SSG, GMERS
Socioeconomic Background	Labor-class family, financially dependent on husband or extended family
Education Level	Primary or secondary education
Marital Status	Married, often in a joint family setup
Cultural Background	Traditional households where modesty and cultural dress preferences influence clothing choices
Medical and Maternity Profile	
Delivery Type	Mostly normal delivery, some C-sections requiring extra care
Hospital Stay Duration	3 to 7 days, depending on delivery type and recovery
Common Health Concerns	Postpartum pain, fatigue, lactation difficulties, anemia, and wound healing (C-sections)
Breastfeeding Challenges	Feels self-conscious breastfeeding in shared hospital spaces due to lack of privacy

Need and preferences

Table 4.7: Need and preferences

Clothing and Comfort Preferences	
Preferred Attire	Some women prefer two-piece outfits (kurta and salwar) for modesty and some loose-fitting one-piece based on cultural requirement.
Laundry and Hygiene Challenges	Limited hospital laundry services: family members wash clothes. OT gowns are washed by hospitals. Blood stains are a major concern-Light-coloured hospital gowns are more hygienic as stains are visible, ensuring proper cleaning, but they require strong chemicals like bleach, which weakens the fabric over time.
Current Hospital Clothing Situation	OT gowns provided only during labour/surgeries; most women wear their own clothes post-delivery. Some continue wearing OT gowns due to lack of personal maternity wear.
Emotional and Psychological Factors	
Privacy Concerns	Uncomfortable breastfeeding around male family members or in crowded wards
Emotional State	Overwhelmed, exhausted, anxious about baby care responsibilities
Support System	Relies on nurses, doctors, and family for guidance and emotional support
Design Considerations for Maternity Wear	
Fabric	Comfortable, breathable, hospital-suitable material, Odor-friendly, Eco-friendly and biodegradable
Maintenance	Easy-to-wash, stain-resistant fabric
Modesty and Functionality	Designs suitable for cultural backgrounds (one-piece and two-piece options)
Affordability	Budget-friendly or hospital-provided maternity wear
Budget	₹100-500
Breastfeeding Accessibility	Front-opening designs (closures) for convenience and privacy
Fit and Adjustability	Loose and flowing, suitable for both C-sections and Normal Delivery
Sleeve Design	Short sleeves for breathability

4.2.2. Conceptual design development

Initial designs, based on user insights, emphasized nursing access, breathable fabrics, and postpartum support. A hospital survey revealed a preference for tops and bottoms over one-piece designs. Consequently, the final design included 15 top/bottom sets and 15 one-piece garments. This adaptation ensured designs were practical and culturally relevant for Vadodara hospitals.

4.3.3 Fabric selection

The market survey revealed that cotton, polyester, and polyester-cotton blends are the predominant fabrics used in hospital linens, aligning with their established properties and cost-effectiveness. The inclusion of Khadi cotton reflected a growing interest in sustainable and patient-comfortable materials, particularly in maternity wards.

4.3.3a Stain resistance and cleaning efficiency testing

The study systematically evaluated various stain removal techniques on different fabric types under controlled conditions, with findings presented in Tables 4.8a and 4.8b. These tables provide stain intensity ratings (on a scale of 0 to 5) for each fabric type and stain removal method at two intervals:

- 5 minutes after stain application (Table 4.8a): Stain intensity was recorded immediately after applying the stain and initiating the removal process.
- 24 hours after stain application (Table 4.8): Stain intensity was measured again to assess the long-term effectiveness of each stain removal technique.

The results were systematically documented to highlight key aspects such as:

- Absorption rate – How quickly each fabric absorbed the blood.
- Spreading pattern – How the stain spread across different fabric types.
- Overall stain removal efficiency – How well each method removed the stain over time.

Table 4.8a: Stain removal testing results after 5-minute stain setting

Method	Cotton	Polyester	Polyester-Cotton Blend	Khadi Cotton
Cold Water Rinse	2	1	1	1
Salt or Baking Soda Paste	1	2	3	2
Hydrogen Peroxide (3 per cent)	0	0	0	0
Enzymatic cleaner	1	0	0	1
Sodium Hypochlorite bleach	0	0	0	0

i. Observations

Hydrogen peroxide (3 per cent) and Sodium hypochlorite bleach achieved complete stain removal (Rating = 0). Cold water rinse and Enzymatic cleaner were effective on polyester but left faint stains on cotton and khadi cotton. Salt and baking soda paste helped reduce stains but did not fully remove them, particularly on blended fabrics.

Table 4.8b: Stain removal testing results after 24-hour stain setting

Method	Cotton	Polyester	Polyester-Cotton Blend	Khadi Cotton
Cold Water Rinse	4	4	5	3
Salt or Baking Soda Paste	5	3	5	3
Hydrogen Peroxide (3 per cent)	1	1	1	3
Enzymatic cleaner	3	2	3	0
Sodium Hypochlorite bleach	0	0	0	0

ii. Observations

Cold water rinse was ineffective for dried stains, leaving heavy stains (Ratings = 4-5). Salt and baking soda paste provided some stain reduction but left noticeable stains. Hydrogen peroxide (3 per cent) was highly effective, especially on polyester, though less effective on khadi cotton. Enzymatic cleaner: Moderate effectiveness (Ratings: 0-3), best on khadi cotton. Sodium Hypochlorite bleach (hospital method) was the most effective, completely removing stains from all fabric types.

Fresh stains are easier to remove with mild treatments like cold water, hydrogen peroxide, or soap scrubbing. Dried stains require stronger treatments such as hydrogen peroxide or Sodium hypochlorite bleach Polyester fabrics performed best in stain removal due to low blood absorption. Cotton and khadi cotton required stronger removal methods but provided better comfort for postpartum women. Frequent use of bleach can weaken cotton and khadi fabrics over time, affecting fabric longevity.

4.3.3b Assessment of fabric reaction to blood stains and ease of cleaning

The study examined how different fabrics absorbed and retained blood stains over time and their ease of cleaning using various stain removal methods. The stain intensity was recorded after 5 minutes (fresh stains) and 24 hours (dried stains) to analysed fabric performance under both conditions.

Table 4.9: Fabric reaction to blood stains after 5 minutes and 24 hours

Fabric Type	Blood Absorption	Stain Retention		Ease of Cleaning	
		After 5 Minutes	After 24 Hours	(5 Minutes)	(24 Hours)
Cotton	High	Moderate	High	Moderate	Difficult
Polyester	Low	Low	Moderate	Easy	Moderate
Polyester-Cotton Blend	Moderate	Moderate	High	Moderate	Difficult
Khadi Cotton	High	Moderate	High	Moderate	Difficult

i. Observations after 5 minutes (fresh stains)

Cotton and khadi cotton started absorbing blood immediately, making early treatment essential. Polyester had minimal absorption, keeping stains on the surface and making them easier to clean. Polyester-cotton blends absorbed blood faster than polyester but were easier to clean than pure cotton. Cold water rinse and mild treatments like Enzymatic cleaner or hydrogen peroxide worked well for fresh stains.

ii. Observations after 24 hours (dried stains)

Cotton and khadi cotton had deep-set stains, making removal difficult even with strong treatments. Polyester resisted deep absorption but required stronger cleaning agents after 24 hours. Polyester-cotton blends showed high stain retention, making dried stains harder to remove. Hydrogen peroxide and bleach were the only effective methods for removing dried stains completely.

4.3.3c Proposed improvements for hospital stain removal processes

The proposed stain removal improvements are based on findings from both the hospital survey and experimental testing. Implementing these recommendations can lead to better stain management, increased fabric longevity, and improved efficiency in hospital laundry operations.

i. Immediate pre-treatment for blood stains improves stain removal efficiency

- Hospital laundry staff often delay stain treatment, leading to deep-set stains that require strong chemicals.
- Enzymatic detergents help break down fresh blood stains, reducing the need for excessive scrubbing or bleaching.
- Training hospital staff to apply enzymatic cleaners early can prevent stains from setting, making regular washing more effective.

ii. Hydrogen peroxide as an oxygen-based bleach for safer stain removal

Hydrogen peroxide (H_2O_2) is a type of oxygen-based bleach that effectively removes blood stains while being less harsh on fabric compared to sodium hypochlorite bleach. As it breaks down, it releases oxygen, lifting stains without causing fabric thinning or colour fading. Hospitals that rely on chlorine bleach experience faster fabric wear and tear, whereas switching to hydrogen peroxide can extend fabric life and reduce replacement costs.

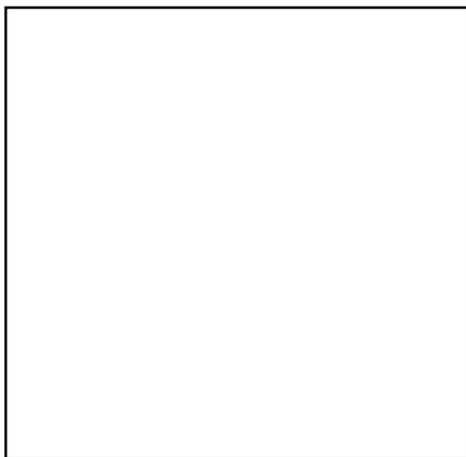
Additionally, other oxygen-based bleaches, such as sodium percarbonate (found in OxiClean), work similarly by releasing oxygen when dissolved in water. These cleaners are effective on older, dried stains, which are harder to remove with regular detergent. Since oxygen-based bleaches do not release harmful fumes, they create a safer working environment for laundry workers while maintaining fabric softness and durability.

iii. Stain removal recommendations

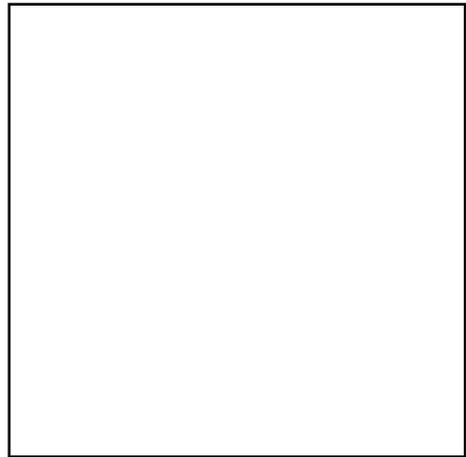
- For fresh stains -Cold water rinse, baking soda paste, hydrogen peroxide (3 per cent) is effective.
- For dried stains - hydrogen peroxide, and sodium hypochlorite bleach (hospital method) are required.
- Frequent bleach washing should be minimized to prolong fabric life.

4.3.3c Fabric selection

Khadi cotton was chosen for gowns due to its exceptional comfort, breathability, and natural, handwoven texture, offering an eco-friendly and sustainable option for patient wear. The linen-cotton blend with a geometric abstract pattern was selected for aesthetic enhancements, such as panels or upper coats, as it offered a visually appealing and modern design, while maintaining a balance of comfort and durability.



Khadi cotton fabric



Linen cotton fabric

4.2.4 Finalizing design and specification sheet

4.2.4a Finalizing Design

The finalized maternity wear designs, selected through a collaborative process involving hospital staff and researchers, were documented in a detailed specification sheet. These specifications ensured the garments were tailored for comfort, functionality, and practicality for postpartum women in hospital

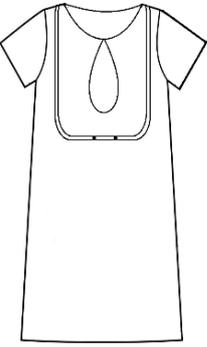
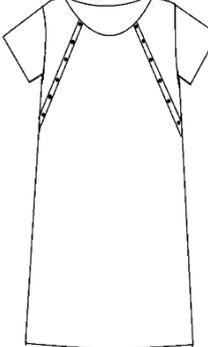
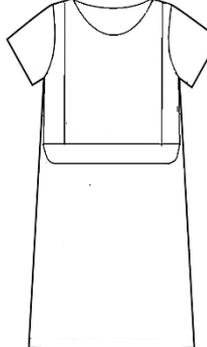
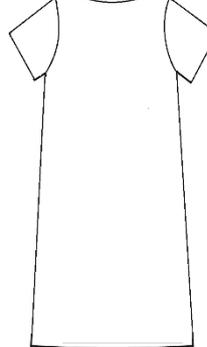
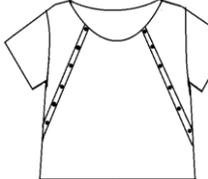
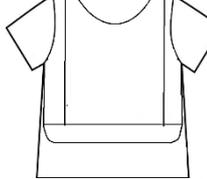
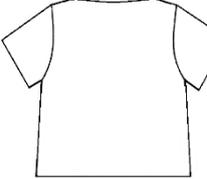
The one-piece outfits included:

- A- teardrop opening at the front covered by a yoke.
- B- diagonal front opening on both sides, secured with buttons.
- C- hidden horizontal welt opening under a coat-like flap.

Similarly, the top-bottom sets featured:

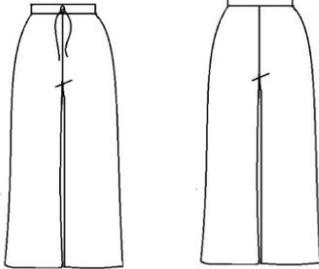
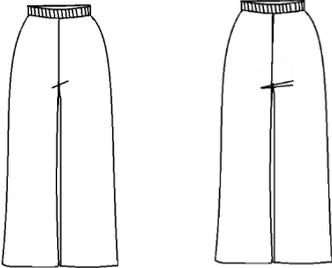
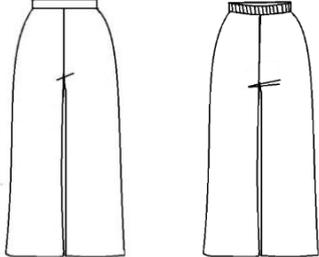
- D- teardrop opening at the front covered by a yoke.
- E- diagonal front opening on both sides, secured with buttons.
- F- hidden horizontal welt opening under a coat-like flap.

Table 4.10a: Final Design of One-pieces and Tops

			
Front of A	Front of B	Front of C	Back of A B C
			
Front of D	Front of E	Front of F	Back of D E F

Out of the 15 one-piece gown designs, 3 were selected for further development, which formed the foundation for the top designs. These tops were created using the design elements of the one-piece gowns to ensure a cohesive and functional fit. This approach not only maintains consistency in design but also supports the unique needs of postpartum women, allowing for easy breastfeeding access, comfort, and ease of movement.

Table 4.10b: Final Design of Bottoms

	
<p>Drawstring waist (cord waistband)</p>	<p>Elasticated waistband</p>
	
<p>Partially elasticated waistband</p>	

Three bottom styles were selected from 15 options based on comfort, fit, and practicality for postpartum women. While the basic design remains the same, three variations were made to suit different needs:

- **Cord Variation:** Adjustable fit with a drawstring.
- **Elastic Variation:** Full elastic waistband for a comfortable, slip-on fit.
- **Partially Elasticated Waistband:** Plain front with an elasticated back for flexibility and support.

4.2.4b Create specification sheet

A detailed specification sheet was created to document the essential design and construction details of the maternity wear prototypes. It serves as a technical guideline for production, ensuring accuracy, quality, and consistency in manufacturing.

Table 4.11a: Specification Sheet of One-piece A

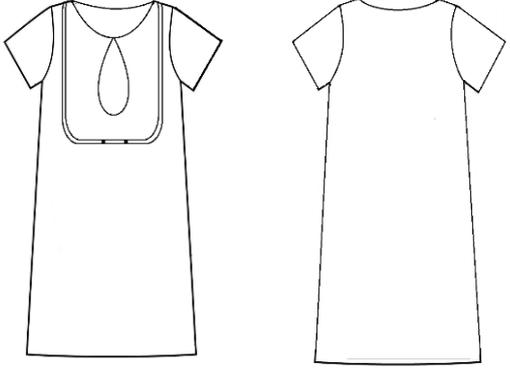
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	One-piece A			
Hospital	GMERS, SSG			
Description	This dress features a teardrop-shaped opening on the front, secured with two buttons for easy nursing access. The design adds a stylish yet functional element to the garment. The back is kept simple for comfort and ease of wear.			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 2	45 (in)	70 per cent Linen / 30 per cent Cotton	Lightweight, breathable, soft texture	soft colors and bold geometric shapes
Fabric 1		Fabric 2		
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Mid-calf	Short	2 Button	Keyhole opening With Yoke	
Garment Measurements				
Measurement			Value (inches)	
Chest (Bust)			36	
Waist			32.4	
Hip			42	
Shoulder Width			14.5	
Armhole Depth			7.5 – 8	
Neck Width			6	
Front Neck Depth			6	
Back Neck Depth			2	
Full Length (One-Piece Gown)			40	

Table 4.11b: Specification Sheet of One-piece B

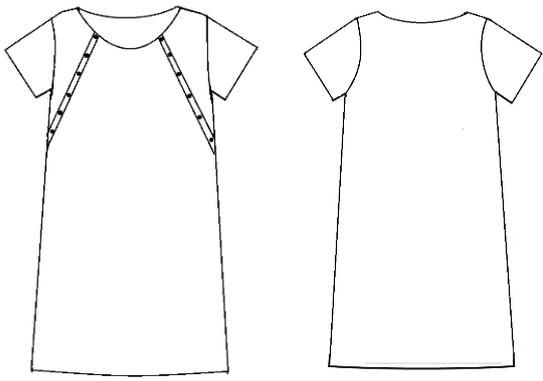
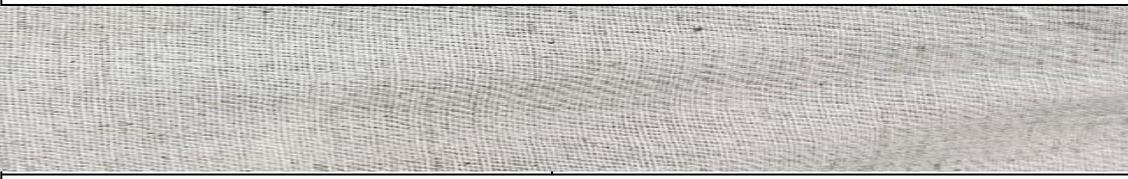
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	One-piece B			
Hospital	GMERS, SSG			
Description	<p>This dress has diagonal openings on both sides, secured with four buttons for nursing access. The design ensures convenience while maintaining a stylish appearance. The back remains plain for comfort and ease of wear.</p>			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 1				
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Mid-calf	Short	2 Button	diagonal front opening on both sides, secured with buttons.	
Garment Measurements				
Measurement			Value (inches)	
Chest (Bust)			36	
Waist			34	
Hip			42	
Shoulder Width			14.5	
Armhole Depth			7.5 – 8	
Neck Width			6	
Front Neck Depth			6	
Back Neck Depth			2	
Full Length (One-Piece Gown)			40	

Table 4.11c: Specification Sheet of One-piece C

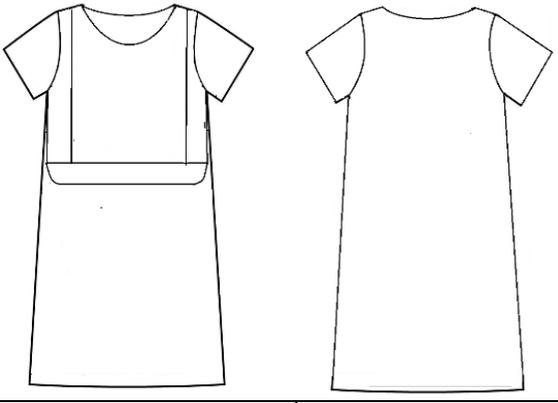
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	One-piece C			
Hospital	GMERS, SSG			
Description	This dress features a horizontal welt opening across the bust for nursing access. The top layer overlaps for coverage while ensuring ease of use. The back remains simple for comfort and practicality.			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 2	45 (in)	70 per cent Linen / 30 per cent Cotton	Lightweight, breathable, soft texture	soft colors and bold geometric shapes
Fabric 1		Fabric 2		
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Mid-calf	Short	No requirement	hidden horizontal welt opening under a coat-like flap.	
Garment measurement				
Measurement		Value (inches)		
Chest (Bust)		36		
Waist		34		
Hip		42		
Shoulder Width		14.5		
Armhole Depth		7.5 – 8		
Neck Width		6		
Front Neck Depth		6		
Back Neck Depth		2		
Full Length (One-Piece Gown)		40		

Table 4.12a: Specification Sheet of Top D

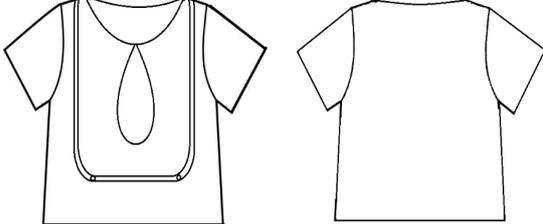
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Top D			
Hospital	GMERS, SSG			
Description	<p>This top feature a teardrop-shaped nursing access beneath a secured front panel with snap buttons or zippers at the bottom corners. The top layer lifts up, allowing discreet breastfeeding access while maintaining coverage.</p>			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 2	45 (in)	70 per cent Linen / 30 per cent Cotton	Lightweight, breathable, soft texture	soft colors and bold geometric shapes
Fabric 1			Fabric 2	
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Top Length- 23(in)	Short	2 Button	Keyhole opening With Yoke	
Garment measurement				
Measurement			Value (inches)	
Chest (Bust)			36	
Waist			34	
Hip			42	
Shoulder Width			14.5	
Armhole Depth			7.5 – 8	
Neck Width			6	
Front Neck Depth			6	
Back Neck Depth			2	
Full Length Top			23	

Table 4.12b: Specification Sheet of Top E

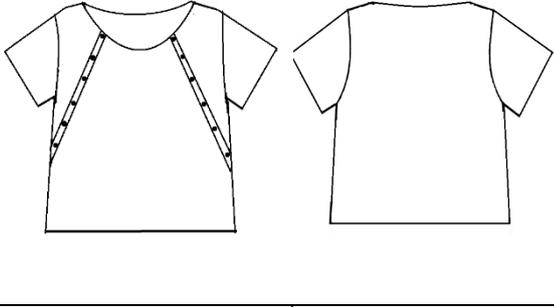
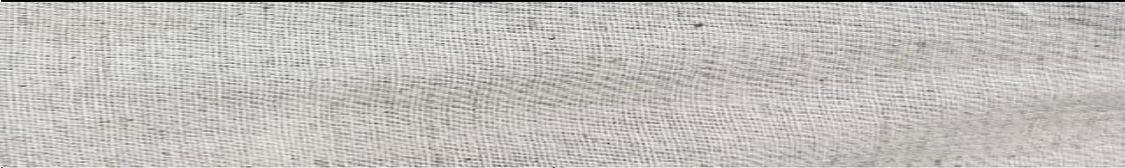
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Top E			
Hospital	GMERS, SSG			
Description	This top feature diagonal buttoned openings along the front panel for easy and discreet nursing access. The back remains plain, ensuring a clean, minimal, and comfortable design.			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 1				
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Top Length-23(in)	Short	2 Button	diagonal front opening on both sides, secured with buttons.	
Garment measurement				
Measurement			Value (inches)	
Chest (Bust)			36	
Waist			34	
Hip			42	
Shoulder Width			14.5	
Armhole Depth			7.5 – 8	
Neck Width			6	
Front Neck Depth			6	
Back Neck Depth			2	
Full Length Top			23	

Table 4.12c: Specification Sheet of Top E

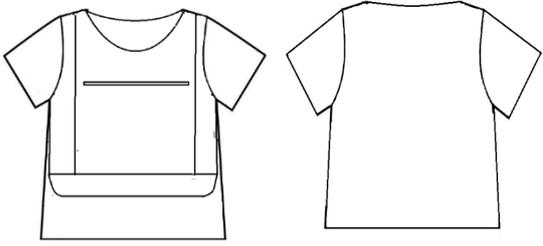
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Top F			
Hospital	GMERS, SSG			
Description	<p>This top feature a horizontal welt opening hidden beneath a flap panel for discreet nursing access. The back remains plain for a clean and comfortable design.</p>			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 2	45 (in)	70 per cent Linen / 30 per cent Cotton	Lightweight, breathable, soft texture	soft colors and bold geometric shapes
Fabric 1			Fabric 2	
				
Design Features				
Length	Sleeve	Fasteners	Nursing Access	
Mid-calf	Short	No requirement	hidden horizontal welt opening under a coat-like flap.	
Garment measurement				
Measurement			Value (inches)	
Chest (Bust)			36	
Waist			34	
Hip			42	
Shoulder Width			14.5	
Armhole Depth			7.5 – 8	
Neck Width			6	
Front Neck Depth			6	
Full Length Top			23	

Table 4.13a: Specification Sheet of Bottom (Drawstring waist)

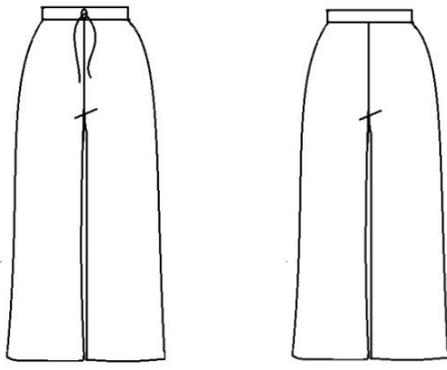
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Bottom DS			
Hospital	GMERS, SSG			
Description	These wide-leg pants feature a fitted waistband with an adjustable front tie for a secure fit. The straight, flowing silhouette provides comfort and ease of movement. The minimalistic design makes them versatile for both casual and formal wear.			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 1				
				
Design Features				
Length	Pocket	Fasteners	Waistband	
Full	No	No requirement	Drawstring waist (cord waistband)	
Garment measurement				
Measurement			Value (in)	
Waist			36	
Hip			42	
Full Length			37	

Table 4.13b: Specification Sheet of Bottom (Drawstring waist)

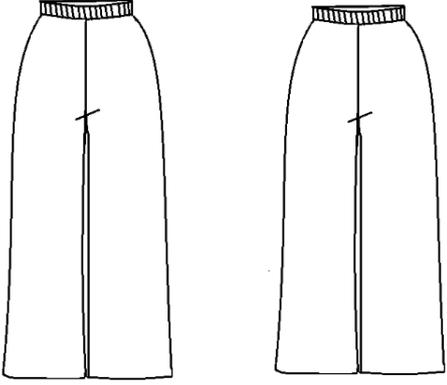
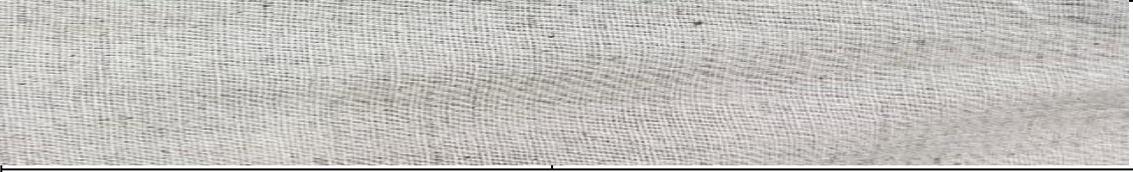
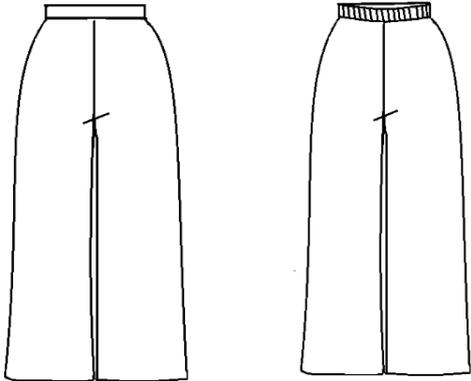
Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Bottom FE			
Hospital	GMERS, SSG			
Description	<p>These wide-leg pants feature an elasticated waistband on both sides, ensuring a comfortable and flexible fit. The flowy silhouette provides ease of movement, making them perfect for casual and relaxed wear. The clean design adds versatility for styling.</p>			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 1				
				
Design Features				
Length	Pocket	Fasteners	Waistband	
Full	No	Elastic	Elasticated waistband	
Garment measurement				
Measurement			Value (in)	
Waist			36	
Hip			42	
Full Length			37	

Table 4.13c: Specification Sheet of Bottom (Drawstring waist)

Garment Specification Sheet		Technical Sketch		
Date	02-03-2025			
Style	Bottom PE			
Hospital	GMERS, SSG			
Description	These wide-leg pants feature a plain front waistband with a back waistband is elasticated, ensuring comfort and flexibility. The clean silhouette and hem detailing add a touch of elegance to the design.			
		Front	Back	
Use	Comfortable, stain-resistant, easy to clean, and adaptable			
User	Postpartum women			
Environment	Public Healthcare Hospital			
Material & Fabric Selection				
Fabric	Width (in)	Composition	Properties	Colour
Fabric 1	45 (in)	100 per cent natural cotton fibers	Soft, breathable, and comfortable	beige-white
Fabric 1				
				
Design Features				
Length	Pocket	Fasteners	Waistband	
Full	No	Elastic	Partially elasticated waistband	
Garment measurement				
Measurement			Value (in)	
Waist			32 (for gown), 36 (for bottom)	
Hip			42	
Full Length			37	

3.2.5 Prototype development and cost estimation

3.2.5a Prototype development

The postpartum maternity wear prototypes were developed with precise pattern drafting, professional stitching, and functional design. The final garments, shown below, ensure comfort, durability, and adaptability.

i. The One-piece variations

One-piece A - Teardrop opening at the front covered by a yoke.



Plate 4.7: Garment A front and back

One-piece B- Diagonal front opening on both sides, secured with buttons.



Plate 4.8: Garment B front and back

One-piece C- Hidden horizontal welt opening under a coat-like flap.



Plate 4.9: Garment C front and back

ii. The top-bottom variations

Top D- Teardrop opening at the front covered by a yoke.



Plate 4.10: Garment D front and back

Top E -Diagonal front opening on both sides, secured with buttons.



Plate 4.11: Garment E front and back

Top F- Hidden horizontal welt opening under a coat-like flap.



Plate 4.12: Garment F front and back

3.2.5b Preparation of bill of material sheet

The cost sheets for all garments are provided below, detailing fabric consumption, material costs, fasteners, stitching expenses, and total production costs.

Table 4.15a: Cost sheet of one-piece A

Cost Sheet			
Style	One-piece A		
Fabric Consumption and Cost per one-piece			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
One-piece A	2.5 meters	0.25 meter	2.75
Total Cost (₹)	225	17.5	242.5
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Button	4	5	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	15	330	345
Stitching Cost per one-piece			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
242.5	5	345	592.5
Grand Total Cost for one-piece			592.5

Table 4.15b: Cost sheet of one-piece B

Cost Sheet			
Style	One-piece B		
Fabric Consumption and Cost per one-piece			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
One-piece	3 meters	-	3
Total Cost (₹)	270	-	270
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Button	8	10	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	15	325	340
Stitching Cost per one-piece			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
270	10	340	620
Grand Total Cost for one-piece			620

Table 4.15c: Cost sheet of one-piece C

Cost Sheet			
Style	One-piece C		
Fabric Consumption and Cost per one-piece			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
One-piece C	2.5 meters	0.25 meter	2.75
Total Cost (₹)	225	17.5	242.5
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
No requirement	-	-	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	-	330	345
Stitching Cost per one-piece			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
242.5		350	592.5
Grand Total Cost for one-piece			592.5

Table 4.16a: Cost sheet of Top D

Cost Sheet			
Style	Top D		
Fabric Consumption and Cost per Top			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Top-D	1.5 meters	0.25 meter	1.75
Total Cost (₹)	135	17.5	152.5
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Button	2	5	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	15	330	345
Stitching Cost per Top			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
152.5	5	345	502.5
Grand Total Cost for Top			502.5

Table 4.16b: Cost sheet of Top E

Cost Sheet			
Style	Top E		
Fabric Consumption and Cost per Top			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Top E	1 meter	-	1
Total Cost (₹)	90	-	90
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Button	8	5	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	15	325	340
Stitching Cost per Top			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
90	10	340	440
Grand Total Cost for Top			440

Table 4.16c: Cost sheet of Top F

Cost Sheet			
Style	One-piece F		
Fabric Consumption and Cost per Top			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Top F	1.5 meters	0.25 meter	1.75
Total Cost (₹)	135	17.5	152.5
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
No requirements	-	-	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	-	350	350
Stitching Cost per Top			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
152.5	-	350	502.5
Grand Total Cost for Top			502.5

Table 4.17a: Cost sheet of Bottom with Draw-string waistband

Cost Sheet			
Style	Bottom DS		
Fabric Consumption and Cost per Bottom			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Bottom DS	2.5 meters	-	2,5
Total Cost (₹)	225	-	225
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
No requirements	-	-	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	-	180	180
Stitching Cost per Bottom			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
225	-	180	405
Grand Total Cost for Bottom			405

Table 4.17b: Cost sheet of Bottom with Fully elasticated waistband

Cost Sheet			
Style	Bottom PE		
Fabric Consumption and Cost per Bottom			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Bottom PE	2.5 meters	-	2,5
Total Cost (₹)	225	-	225
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Elastic	0.5 meter	15	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	-	180	180
Stitching Cost per Bottom			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
225	15	180	420
Grand Total Cost for Bottom			420

Table 4.17c: Cost sheet of Bottom with Partially elasticated waistband

Cost Sheet			
Style	Bottom FE		
Fabric Consumption and Cost per Top			
Garment	Fabric 1 - Khadi Cotton (₹90/m)	Fabric 2 - Linen Cotton (₹70/m)	Total fabric
Bottom FE	2.5 meters	-	2,5
Total Cost (₹)	225	-	225
Fasteners and Trimmings Cost			
Item	Quantity	Total Cost (₹)	
Elastic	1.5 meter	30	
Stitching Cost			
Component	Buttonhole	Stitching labour	Total Cost (₹)
	-	180	180
Stitching Cost per Bottom			
Total Fabric Cost	Fasteners & Trimmings Cost	Stitching Cost	Grand Total (₹)
225	30	180	435
Grand Total Cost for Bottom			435

4.3 Testing and Evaluation

The testing and evaluation of maternity garments were conducted through a wear trial with 12 postpartum women at GMERS and SSG Hospitals. Each participant wore three garments from their assigned category (one-piece outfits or top-bottom sets) for 10 hours to assess comfort, functionality, and nursing accessibility. The evaluation included quantitative analysis based on key attributes such as fabric softness, breathability, ease of wearing, and breastfeeding accessibility, along with qualitative feedback from users. The findings highlighted garment preferences, areas for improvement, and recommendations for future maternity wear enhancements, ensuring optimal comfort, usability, and sustainability.

4.3.1 Conduct wear trials

The wear trial evaluation was conducted at GMERS and SSG Hospitals with 12 postpartum women to assess the usability and acceptability of six maternity wear designs. The trial included three one-piece outfits and three top-bottom sets, each with different opening mechanisms for nursing accessibility. Each participant wore all three garments within their assigned category (either one-piece outfits or top-bottom sets) for 10 hours

(from 10:00 am to 8:00 pm) before the garments were washed at night for hygiene assessment.

At GMERS and SSG Hospital, the six garments tested were coded A to F, based on their unique design features (Image reference: Annexure-6). The one-piece outfits included:

- A. Teardrop opening at the front covered by a yoke.
- B. Diagonal front opening on both sides, secured with buttons.
- C. Hidden horizontal welt opening under a coat-like flap.

Similarly, the top-bottom sets featured:

- D. Teardrop opening at the front covered by a yoke.
- E. Diagonal front opening on both sides, secured with buttons.
- F. Hidden horizontal welt opening under a coat-like flap.

Additionally, a goggle form (Appendix-5) was used as part of the evaluation process to capture further insights.

4.3.2 Analysis of data

4.3.2a Quantitative analysis

To assess the effectiveness of the designed maternity wear garments, a comparative evaluation was conducted based on key attributes that determine comfort, functionality, and aesthetic appeal. The evaluation included parameters such as fabric softness, skin irritation, breathability, absorbency, stretch and flexibility, ease of wearing and removing, dignity and respect, breastfeeding accessibility, odour resistance, design aesthetics, sustainability, and overall satisfaction

i. Comparison of garment A B C performance based on key attributes

The table showed the comparative performance of maternity wear garments A, B, and C across various key attributes. It highlighted that all three garments achieved 100 per cent ratings in fabric softness, skin irritation, breathability, absorbency, stretch & flexibility, sustainability, and overall satisfaction, indicating their superior quality and comfort. Garments B and C performed exceptionally well, scoring 100 per cent in most categories, including ease of wearing & removing, dignity & respect, and breastfeeding accessibility. However, Garment A received slightly lower ratings in ease of wearing & removing (80 per cent), dignity & respect (80 per cent), and odour resistance (80 per cent), suggesting

potential areas for improvement. Similarly, Garment B showed 80 per cent in breastfeeding accessibility, odour resistance, and design aesthetics. The table emphasized the significance of comfort, design, and functionality in maternity wear, highlighting the importance of features that enhanced postpartum convenience and overall user satisfaction.

Table 4.18a: Comparison of garment A B C performance based on key attributes

Attribute	Garment A		Garment B		Garment C	
	(Avg)	%	(Avg)	%	(Avg)	%
Fabric Softness	5	100	5	100	5	100
Skin Irritation	5	100	5	100	5	100
Breathability	5	100	5	100	5	100
Absorbency	5	100	5	100	5	100
Stretch & Flexibility	5	100	5	100	5	100
Ease of Wearing & Removing	4	80	5	100	5	100
Dignity & Respect	4	80	5	100	5	100
Breastfeeding Accessibility	5	100	4	80	5	100
Odor Resistance	4	80	4	80	5	100
Design Aesthetics	4	80	4	80	5	100
Sustainability	5	100	5	100	5	100
Overall Satisfaction	5	100	5	100	5	100

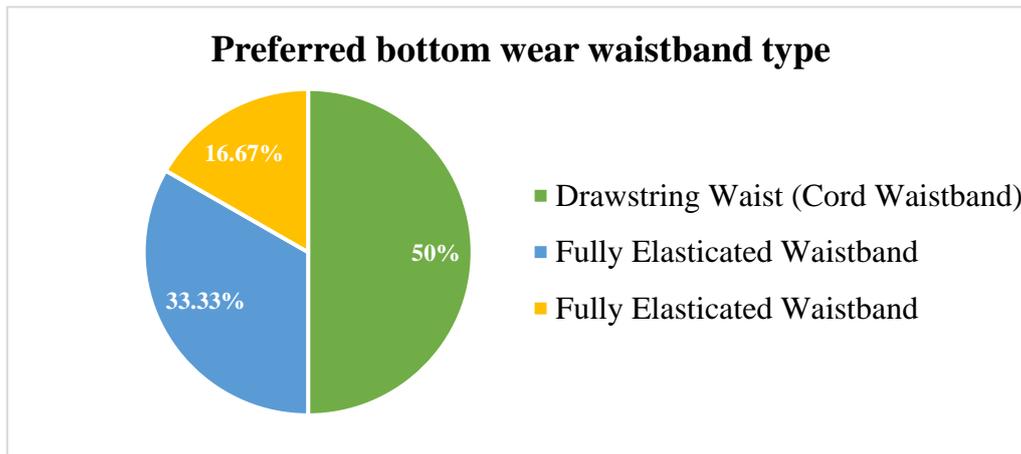
ii. Comparison of garment D E F performance based on key attributes

The tables showed the comparative performance of maternity wear garments D, E, and F across various key attributes. They highlighted that all three garments achieved 100 per cent ratings in fabric softness, skin irritation, stretch & flexibility, odour resistance, and overall satisfaction, demonstrating their superior quality and comfort. Garments E and F performed exceptionally well, scoring 100 per cent across all evaluated attributes, ensuring maximum breathability, absorbency, and sustainability. In contrast, Garment D showed slightly lower ratings in breathability (97.2 per cent), absorbency (94.2 per cent), and design aesthetics (97.2 per cent), yet still maintained a high level of approval. The tables emphasized the importance of fabric selection, design considerations, and functional adaptability in maternity wear, highlighting key factors that contributed to postpartum support and overall user satisfaction.

Table 4.18b: Comparison of garment D E F performance based on key attributes

Attribute	Garment D		Garment E		Garment F	
	(Avg)	(%)	(Avg)	(%)	(Avg)	(%)
Fabric Softness	5	100	5	100	5	100
Skin Irritation	5	100	5	100	5	100
Breathability	4.86	97.2	5	100	5	100
Absorbency	4.71	94.2	5	100	5	100
Stretch & Flexibility	4.86	97.2	5	100	5	100
Ease of Wearing & Removing	4.86	97.2	5	100	5	100
Dignity & Respect	4.86	97.2	5	100	5	100
Breastfeeding Accessibility	4.86	97.2	5	100	5	100
Odor Resistance	5.00	100.	5	100	5	100
Design Aesthetics	4.86	97.2	5	97	5	100
Sustainability	4.86	97.2	5	100	5	100
Overall Satisfaction	4.86	97.2	5	100	5	100

iii. Most preferred bottom



Graph: 4.37: Bottom preferences

The graph showed that the Drawstring Waist (Cord Waistband) was the most preferred bottom wear waistband, chosen by 50 per cent of respondents. The Fully Elasticated Waistband followed with 33.33 per cent, offering comfort and ease of wear. Another category of Fully Elasticated Waistband accounted for 16.67 per cent, possibly indicating a design variation. The popularity of drawstring waists suggested that consumers preferred adjustable and flexible fits. Overall, while elastic waistbands were favoured for comfort, drawstring waists remained the top choice for versatility.

iv. Analysis of rankings

This analysis presents the ranking of garments based on user preferences, categorized into three levels: Most Preferred (Rank 1), Moderate Preference (Rank 2), and Least

Preferred (Rank 3). The garments analysed are A, B, C, D, E, and F, based on multiple ranking inputs.

Table 4.19a: Preferences for A, B, and C

Garment	Most preferred (Rank 1)	Moderate preference (Rank 2)	Least preferred (Rank 3)
A	0 times	2 times	4 times
B	2 times	3 times	1 time
C	4 times	1 time	1 time

Garment C was the most preferred, ranked 1st 4 times. Garment A was the least preferred, ranked 3rd 4 times. Garment B had a balanced ranking, with a mix of 1st, 2nd, and 3rd positions.

Table 4.19b: Preferences for D, E and F

Garment	Most preferred (Rank 1)	Moderate preference (Rank 2)	Least preferred (Rank 3)
D	0 times	4 times	2 times
E	3 times	1 time	2 times
F	3 times	3 times	0 times

Garments E and F were the most preferred, both ranked 1st 3 times each. Garment D was the least preferred, ranked 3rd 2 times and never ranked 1st. Garment F was consistently favoured, never ranking 3rd.

Qualitative analysis

In addition to numerical ratings, participants provided open-ended feedback regarding their experience with the garments. Several themes emerged from this feedback:

Fabric and Comfort: All garments were considered soft, breathable, and comfortable.

Coverage and Modesty: Some participants suggested adding buttons to the yoke of Garment A to enhance coverage and modesty.

Breastfeeding Accessibility: While Garments C, D, E, and F were rated highly for nursing ease, some participants found Garment B's button placement slightly inconvenient.

Aesthetic Preferences: A few participants suggested darker colors for practicality and geometric prints for added style.

User feedback and suggestion

Based on user feedback, the following improvements have been suggested:

Table 4.20: User feedback and suggestion

Garment	User feedback	Suggestion
A	The fabric is really soft and comfortable, but I would prefer a bit more coverage at the yoke area.	Extra buttons needed for better yoke coverage.
	The garment is easy to wear, but I think a darker colour would be more practical for hospital use.	Darker colour options to prevent stains. yoke should be expanded
B	The button design is great, but breastfeeding access could be a little easier.	Modify button placement to make breastfeeding more convenient.
	The placket feels a bit loose. Stitching it in place would make it more durable.	Improve button placket stitching for durability.
C	The hidden flap is a great feature, but I found the garment slightly restrictive.	Increase stretchability for better movement and flexibility.
	Breastfeeding access is good, but the flap could be a bit wider for convenience.	Modify flap opening size for improved breastfeeding accessibility.
D	Perfect in every way, comfortable, breathable, and easy to wear	Add two more extra button in yoke
	This is exactly what I needed for my hospital stay.	Add Invisible zipper in yoke
E	The fabric is really soft, and I love the simple but stylish design	No modifications suggested
	Fits perfectly—no complaints at all.	users were fully satisfied.
F	The hidden flap makes nursing so easy while maintaining dignity	No specific concerns were raised
		the garment met all expectations.

4.3.3 Recommendations for Future Study

1. Smart textiles, including moisture-wicking, antibacterial, and biodegradable fabrics, enhance postpartum comfort and hygiene.
2. The integration of traditional Indian clothing elements and climate-specific fabric choices improves wearability and cultural relevance.
3. Assessing large-scale production, affordability, and consumer preferences is necessary for the wider adoption of improved maternity wear.
4. Research on blood type influence in stain removal helps develop fabric-friendly cleaning solutions for maternity wear, considering differences in protein composition and absorption across blood groups. This research leads to stain-resistant fabrics or specialized laundry treatments for better garment maintenance.

CHAPTER V

SUMMARY AND CONCLUSION

5.1 Introduction

Childbirth is a significant event, with approximately 140 million births occurring worldwide each year. In India, nearly 25 million births take place annually, accounting for 18 per cent of global births. Over the years, India's birth rate has declined from 32 per 1,000 in 1981 to 17 per 1,000 in 2023, driven by improved healthcare, higher female literacy, and greater awareness of family planning. Despite this decline, regional variations persist. Bihar and Uttar Pradesh record the highest birth rates at 25.8 and 25.4 per 1,000, respectively, while Kerala and Tamil Nadu have some of the lowest at 13.3 and 14.5 per 1,000. In Gujarat, the birth rate stands at 18.2 per 1,000, slightly above the national average, while Vadodara has a lower rate of 13.0 per 1,000, attributed to better healthcare access and higher female literacy.

Despite advancements in maternal healthcare, many postpartum women face challenges with traditional hospital gowns, which often lack comfort and functionality. Research indicates that 75% of postpartum women find standard gowns uncomfortable, while 68% struggle with breastfeeding due to impractical openings (Syed et al., 2022). Additionally, 82% of healthcare professionals report that these gowns restrict movement and hinder medical procedures. The primary issue stems from gowns being designed with cost-effectiveness in mind rather than patient comfort, leaving many new mothers feeling exposed, restricted, and unsupported during their postpartum recovery.

The lack of appropriate maternity wear impacts both mothers and healthcare providers, affecting the quality of postpartum care. When 60% of postpartum women feel self-conscious in hospital gowns, it can lead to emotional distress, dissatisfaction with care, and strained communication with medical staff. In contrast, well-designed maternity wear can enhance mobility, provide dignity, and support breastfeeding, contributing to better postpartum experiences. Addressing these concerns is essential for fostering a supportive and efficient healthcare environment, ensuring that new mothers feel comfortable, respected, and empowered during their recovery.

5.2 Purpose of the study

Postpartum women in public healthcare hospitals often experience discomfort due to the lack of hospital-provided maternity clothing after childbirth. While they receive a gown for the operation theatre (OT) for one day, no clothing is provided in the ward, leaving them to rely on their own garments. Many women wear nylon knit nightgowns, which are non-breathable, uncomfortable, and prone to bloodstains that are difficult to **remove**. Additionally, some mothers, especially from economically weaker sections, do not have adequate clothing, forcing them to manage with old, worn-out, or insufficient garments, further compromising their comfort, hygiene, and dignity.

5.3 Objective of the research

- 5.3.1** To identify the needs and preferences of postpartum women in public healthcare hospital
- 5.3.2** To design postpartum maternity wear that meets the needs of the target group
- 5.3.3** To test the usability and acceptability of the designed maternity wear

Delimitation of the study:

This study focuses on postpartum maternity wear in public hospitals, specifically at GMERS (Gujarat Medical Education and Research Society) Medical College & Hospital, Gotri, and SSG (Sir Sayajirao General) Hospital in Vadodara.

5.4 Methodology

This study followed an applied research approach, focusing on the development of adaptive maternity clothing for postpartum women in public healthcare hospitals. The research was conducted in three phases: need-gap identification, design development, and testing & evaluation. A preliminary field visit to government and charity-run hospitals in Vadodara helped identify the challenges faced by postpartum women due to the lack of dedicated maternity wear.

A mixed-methods approach was employed, combining quantitative and qualitative data collection techniques such as surveys, interviews, and observations. Secondary data was gathered from books, dissertations, and academic databases. The study aimed to design adaptive maternity garments with adjustable features to enhance comfort, mobility, and breastfeeding accessibility while ensuring hygiene and practicality.

The developed garments underwent performance testing, followed by a wear trial involving twelve postpartum women at SSG and GMERS hospitals. Participants evaluated the garments over a structured six-day rotation, assessing usability factors such as fabric softness, breathability, and stretchability. Data analysis included descriptive statistics, percentage calculations, and Rank Order Analysis, along with qualitative feedback to refine garment designs. The findings contributed to optimizing adaptive maternity wear for improved functionality and comfort in public healthcare settings.

5.5 Result and discussion

This study aimed to design and develop safe, comfortable, and functional postpartum maternity wear that addressed the specific needs of postpartum women in public healthcare hospitals. The garments were designed to provide ease of wear, accessibility for medical procedures, and comfort, ensuring a dignified and practical clothing solution. Additionally, the study focused on using sustainable materials and efficient design to enhance user experience while minimizing environmental impact.

The study was carried out in three phases. The first phase involved identifying need gaps, including a survey of existing maternity wear and the challenges faced by postpartum women. The second phase focused on design solutions and development, which included creating user personas, Conceptual design development, finalizing designs, and developing prototypes. The third phase involved testing and evaluation, where wear trials were conducted with selected participants, feedback was collected, and an analysis was performed to refine the final product.

5.5.1 Need gap identification

The study began with an in-depth analysis of the challenges faced by postpartum women in public healthcare hospitals regarding their maternity wear. A hospital survey was conducted with postpartum mothers, alongside interviews with healthcare providers, to understand their specific needs. The findings revealed that existing maternity wear lacked breastfeeding accessibility, comfort, and dignity, making it difficult for women to manage their clothing while recovering. Many garments were ill-fitted, non-breathable, and impractical for hospital stays, failing to provide the ease required for frequent medical checkups and movement. Additionally, market research showed that available maternity clothing options were either expensive or did not align with hospital requirements,

highlighting a significant gap in sustainable and functional postpartum wear. This phase established the foundation for designing garments that would offer better coverage, ease of wear, and accessibility for both mothers and medical staff.

5.5.2 Design solutions and development of postpartum maternity wear

Based on the identified need gaps, the design phase focused on developing maternity wear that was comfortable, functional, and sustainable. User personas were created to understand the specific preferences and movement requirements of postpartum women. Conceptual designs were developed, incorporating various opening mechanisms for breastfeeding accessibility, such as teardrop openings, diagonal openings with buttons, and hidden welt openings. Sustainable fabrics like Khadi cotton and linen were selected for their breath-ability, absorbency, and comfort. The fabric was also tested for stain removal efficiency and overall durability to ensure hygiene and ease of maintenance. Prototypes were developed for six different designs, including three one-piece outfits and three top-bottom sets, each with unique features to address medical accessibility, ease of wear, and modesty concerns. Cost estimation was also conducted to ensure affordability and feasibility for large-scale production.

5.5.3 Testing and Evaluation

To assess the effectiveness of the designed garments, wear trials were conducted at GMERS and SSG Hospitals with 12 postpartum women. Each participant tested three garments from either the one-piece or top-bottom category for 10 hours, and feedback was gathered on key aspects such as comfort, accessibility, breath-ability, skin-friendliness, and overall satisfaction. Comparative evaluations showed that all garments performed well, with minor variations in stretch-ability, breastfeeding accessibility, and design aesthetics. The drawstring waistband was the most preferred choice due to its adjust-ability. User feedback suggested minor modifications, including expanding yoke coverage, adjusting button placements for better movement. Final refinements were made based on these insights, ensuring that the maternity wear met the functional, comfort, and dignity needs of postpartum mothers while maintaining sustainability and ease of use.

Conclusion

This study successfully identified the challenges faced by postpartum women in public healthcare hospitals regarding maternity wear and developed an adaptive clothing solution that enhances comfort, functionality, and dignity. The research revealed that existing hospital gowns are often uncomfortable, impractical for breastfeeding, and inadequate in providing coverage, leading to emotional distress and reduced mobility among new mothers. By addressing these issues, the study proposed postpartum maternity wear that integrates breastfeeding accessibility, adjustable fit, breathable fabrics, and ease of movement to enhance user experience.

The design phase resulted in the development of six prototypes—three one-piece garments and three top-bottom sets—incorporating sustainable materials like Khadi cotton and linen for their comfort and durability. The wear trials with 12 postpartum women provided valuable insights into fabric preferences, ease of use, and necessary modifications, ultimately leading to refined designs that align with the needs of both mothers and healthcare providers.

The findings highlight the importance of functional, well-designed maternity wear in improving postpartum care, suggesting that hospitals should consider implementing specialized garments to support maternal recovery. Additionally, the study emphasizes the potential for sustainable and affordable maternity wear solutions, which could be scaled for widespread adoption in public healthcare settings. By bridging the gap between functionality and comfort, this research contributes to enhancing the well-being and dignity of postpartum women, ensuring a positive and supportive recovery experience.

Scope of the study

This study focuses on improving postpartum maternity wear by addressing the comfort, functionality, and accessibility needs of women in public hospitals. It provides practical clothing solutions that can be integrated into healthcare systems, ensuring ease of movement and medical accessibility. The study also contributes to sustainable fashion by promoting eco-friendly fabrics and ethical production methods. Customization plays a key role, as the designs can be adapted to different body types, cultural preferences, and medical requirements.

- the research enhances breastfeeding accessibility through innovative design features such as adjustable openings.
- The findings have commercialization potential, opening avenues for affordable, mass-produced postpartum clothing in both public and private sectors.
- Furthermore, this study can influence healthcare policies to standardize postpartum clothing in hospitals, improving the overall experience for new mothers. It also lays the groundwork for future research on adaptive and functional clothing, encouraging further innovation in maternity and postnatal fashion.

Recommendation for further research

- 1) Smart textiles, including moisture-wicking, antibacterial, and biodegradable fabrics, enhance postpartum comfort and hygiene.
- 2) The integration of traditional Indian clothing elements and climate-specific fabric choices improves wearability and cultural relevance.
- 3) Assessing large-scale production, affordability, and consumer preferences is necessary for the wider adoption of improved maternity wear.
- 4) Research on blood type influence in stain removal helps develop fabric-friendly cleaning solutions for maternity wear, considering differences in protein composition and absorption across blood groups. This research leads to stain-resistant fabrics or specialized laundry treatments for better garment maintenance.

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Appendix 1a

Informed Consent form for Maternity women & Healthcare provider

DEPARTMENT OF CLOTHING AND TEXTILE

FACULTY OF FAMILY & COMMUNITY SCIENCES

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

VADODARA

Design solution for maternity wear in public health care hospitals.

INVESTIGATORS

Guide – Dr. Reena Bhatia

Researcher-Dhruvika Patel

Department of Clothing and Textiles

Department of Clothing and Textiles

Faculty of Family and Community Sciences
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Sciences The Maharaja Sayajirao
University of Baroda (M):
+919327054017

Email Id: reenabhatia-ct@msubaroda.ac.in

Email Id: dhruvikaptel404@gmail.com

We invite you to take part in a research study, which seeks to gain insights into the

Design solutions for maternity wear in public health care hospitals. as a part of partial fulfilment of master's degree program which is self-funded. Participation in this study is entirely voluntary. If you decide to participate, you must sign this form to show that you want to take part.

Purpose of the Research: This research study is being done to investigate and identify design solutions for maternity wear in public healthcare hospitals, exploring the perspectives of healthcare providers, patients, and administrators on optimal design features, functionality, and comfort to improve patient care and dignity during pregnancy and postpartum periods.

Time Duration of the Procedures and Study: Your participation in this study will last approximately 20-30 min and it would be one time interaction at your convenience.

Procedures: If you agree to participate in this study, you will be asked to a complete questionnaire to maternity women & health care providers. The questionnaire will be asked about your experience on current maternity wear.

Risks and Benefits: There are no known risks associated with participating in this study. The information gathered will contribute to improving maternity wear design solutions in public healthcare hospitals.

Confidentiality: All information collected during this study will be kept strictly confidential. Your name will not be used in any reports or publications resulting from this study. Your responses will be assigned a unique identification number that will be used to identify your data.

Voluntary Participation: Participation in this study is entirely voluntary. You may refuse to participate or withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled.

Cost: Participating in this study will entail no associated costs or charges.

Contact Information: If you have any questions or concerns about this study, please contact

(Dhruvika Patel ,9327054017, Email Id-dhruvikapatel404@gmail.com)

Consent: By signing this consent form, you are agreeing to participate in this study. You understand that you are free to withdraw from the study at any time without penalty. You also understand that your participation in this study is confidential.

Signature of participant

Investigator's Statement

I have explained the research procedures and the purpose of the study. The participant was given an opportunity to discuss these procedures and ask any additional questions.

Researcher's name and signature

Date:

Place:

Note: Please sign and return a copy of this consent form to confirm your participation in the study. Thank you for your willingness to contribute to this research.

Appendix 1b

પ્રસૂતિ મહિલાઓ અને આરોગ્યસંભાળ પ્રદાતા માટે જાણકાર સંમતિ ફોર્મ

કપડાં અને કાપડ વિભાગ

ફેકલ્ટી ઓફ ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ

મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ બરોડા વડોદરા

જાહેર આરોગ્ય સંભાળ હોસ્પિટલોમાં પ્રસૂતિ વસ્ત્રો માટે ડિઝાઇન સોલ્યુશન.

તપાસકર્તાઓ

માર્ગદર્શક - ડો. રીના ભાટિયા

સંશોધક-ઘુવિકા પટેલ

કપડાં અને કાપડ વિભાગ

કપડાં અને કાપડ વિભાગ

ફેકલ્ટી ઓફ ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ

ફેકલ્ટી ઓફ ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ

ધ મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ બરોડા

ધ મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ બરોડા

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ઈમેલ આઈડી: dhruvikaptel404@gmail.com

અમે તમને એક સંશોધન અભ્યાસમાં ભાગ લેવા માટે આમંત્રિત કરીએ છીએ, જે વિશે આંતરદૃષ્ટિ મેળવવાનો પ્રયાસ કરે છે. જાહેર આરોગ્ય સંભાળ હોસ્પિટલોમાં પ્રસૂતિ વસ્ત્રો માટે ડિઝાઇન સોલ્યુશન્સ. માસ્ટર ડિગ્રી પ્રોગ્રામની આંશિક પરિપૂર્ણતાના ભાગ રૂપે જે સ્વ-ભંડોળ છે. આ અભ્યાસમાં સહભાગિતા સંપૂર્ણપણે સ્વૈચ્છિક છે. જો તમે ભાગ લેવાનું નક્કી કરો છો, તો તમે ભાગ લેવા માગો છો તે બતાવવા માટે તમારે આ ફોર્મ પર સહી કરવી પડશે.

સંશોધનનો હેતુ: આ સંશોધન અભ્યાસ સાર્વજનિક આરોગ્ય સંભાળ હોસ્પિટલોમાં પ્રસૂતિ વસ્ત્રો માટે ડિઝાઇન ઉકેલોની તપાસ કરવા અને ઓળખવા માટે કરવામાં આવી રહ્યો છે, આરોગ્યસંભાળ પ્રદાતાઓ, દર્દીઓ અને વહીવટકર્તાઓના દૃષ્ટિકોણની શોધખોળ કરવા માટે શ્રેષ્ઠ ડિઝાઇન સુવિધાઓ, કાર્યક્ષમતા અને આરામ માટે દર્દીની સંભાળ સુધારવા અને ગર્ભાવસ્થા અને પોસ્ટપાર્ટમ સમયગાળા દરમિયાન ગૌરવ.

પ્રક્રિયા અને અભ્યાસનો સમયગાળો: આ અભ્યાસમાં તમારી સહભાગિતા લગભગ 20-30 મિનિટ ચાલશે અને તે તમારી અનુકૂળતા મુજબ એક વખતની ક્રિયાપ્રતિક્રિયા હશે.

પ્રક્રિયાઓ: જો તમે આ અભ્યાસમાં ભાગ લેવા માટે સંમત થાઓ છો, તો તમને પ્રસૂતિ મહિલાઓ અને આરોગ્ય સંભાળ પ્રદાતાઓને સંપૂર્ણ પ્રશ્નાવલિ પૂછવામાં આવશે. પ્રશ્નાવલીમાં વર્તમાન પ્રસૂતિ વસ્ત્રો પરના તમારા અનુભવ વિશે પૂછવામાં આવશે.

જોખમો અને લાભો: આ અભ્યાસમાં ભાગ લેવા સાથે સંકળાયેલા કોઈ જાણીતા જોખમો નથી. ભેગી કરેલી માહિતી જાહેર આરોગ્ય સંભાળ હોસ્પિટલોમાં પ્રસૂતિ વસ્ત્રોના ડિઝાઇન સોલ્યુશન્સ સુધારવામાં ફાળો આપશે.

ગોપનીયતા: આ અભ્યાસ દરમિયાન એકત્રિત કરવામાં આવેલી તમામ માહિતી સખત રીતે ગોપનીય રાખવામાં આવશે. તમારા નામનો ઉપયોગ આ અભ્યાસના પરિણામે થતા કોઈપણ અહેવાલો અથવા પ્રકાશનોમાં કરવામાં આવશે નહીં. તમારા પ્રતિસાદોને એક અનન્ય ઓળખ નંબર અસાઇન કરવામાં આવશે જેનો ઉપયોગ તમારા ડેટાને ઓળખવા માટે કરવામાં આવશે.

સ્વૈચ્છિક ભાગીદારી: આ અભ્યાસમાં સહભાગિતા સંપૂર્ણપણે સ્વૈચ્છિક છે. તમે કોઈપણ સમયે દંડ અથવા લાભોની ખોટ વિના અભ્યાસમાં ભાગ લેવાનો અથવા પાછો ખેંચવાનો ઇનકાર કરી શકો છો જેના માટે તમે અન્યથા હકદાર છો.

કિંમત: આ અભ્યાસમાં ભાગ લેવા માટે કોઈ સંબંધિત ખર્ચ અથવા શુલ્ક લાગશે નહીં.

સંપર્ક માહિતી: જો તમને આ અભ્યાસ વિશે કોઈ પ્રશ્નો અથવા ચિંતાઓ હોય, તો કૃપા કરીને સંપર્ક કરો (ધ્રુવિકા પટેલ ,9327054017, ઈમેલ [આઈડી -dhruvikapatel404@gmail.com](mailto:dhruvikapatel404@gmail.com))

સંમતિ: આ સંમતિ ફોર્મ પર સહી કરીને, તમે આ અભ્યાસમાં ભાગ લેવા માટે સંમત થાઓ છો. તમે સમજો છો કે તમે કોઈપણ સમયે દંડ વિના અભ્યાસમાંથી ખસી જવા માટે સ્વતંત્ર છો. તમે એ પણ સમજો છો કે આ અભ્યાસમાં તમારી ભાગીદારી ગોપનીય છે.

સહભાગીની સહી

તપાસકર્તાનું નિવેદન

મેં સંશોધન પ્રક્રિયાઓ અને અભ્યાસનો હેતુ સમજાવ્યો છે. સહભાગીને આ પ્રક્રિયાઓની ચર્ચા કરવાની અને કોઈપણ વધારાના પ્રશ્નો પૂછવાની તક આપવામાં આવી હતી.

સંશોધકનું નામ અને હસ્તાક્ષર

તારીખ:

સ્થળ:

નોંધ: અભ્યાસમાં તમારી સહભાગિતાની પુષ્ટિ કરવા માટે કૃપા કરીને આ સંમતિ ફોર્મ પર સહી કરો અને તેની નકલ પરત કરો. આ સંશોધનમાં યોગદાન આપવાની તમારી ઈચ્છા બદલ આભાર.

Appendix 2



Department of Clothing and Textiles
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda
Fatehgunj Road, Vadodra-390002
Ph: (+91-0265)2795522

PERMISSION LETTER

Date: 21/11/2024

To,

Subject: Seeking permission to collect user data for academic research

Dear Sir/ Madam,

I am writing to request permission for my master student, Dhruvika Patel, to collect data from this renowned government Hospital for her research dissertation titled "Design Solutions for Maternity Wear in Public Healthcare Hospitals."

As her guide, I oversee her research and ensure its adherence to ethical standards. The study aims to:

To investigate and develop evidence-based design solutions for maternity wear in public healthcare hospitals, enhancing patient-Centered care and healthcare provider efficiency.

The research methodology involves:

1. Semi-structured interviews with healthcare providers and administrators
2. Questionnaires administered to postpartum mothers.
3. Observational studies of maternity wear usage and healthcare provider-patient interactions

Dhruvika will:

1. Coordinate with hospital staff for interviews and data collection

2. Obtain informed consent from participants
3. Maintain confidentiality and anonymity of all data collected
4. 6-week wear trial period with participating postpartum women.

Wear Trial Period Details:

Duration: 6 weeks

Participants: 10 postpartum women

Objective: Assess comfort, functionality, and patient satisfaction with specially designed maternity wear shorts

The expected outcomes of this study include:

1. Informing the development of effective and patient-Centered maternity wear design solutions.
2. Enhancing patient satisfaction and healthcare experience.
3. Improving healthcare provider efficiency and resource allocation.

Time Duration: September 2024 to April 2025

I assure minimal disruption to hospital operations and adhere to all applicable ethics guidelines.

Please consider granting permission for this research, optimal which area will contribute to improving patient care and healthcare services.

Looking forward to your permission. Consideration of the request will deeply appreciate your support in advancing healthcare research and improving patient care and supporting the cause of education

Sincerely,

Dr. Reena Bhatia

I/C Head & Guide

Department of Clothing and Textiles,

Faculty of Family and Community Sciences,

The Maharaja Sayajirao University of Baroda, Vadodara

Appendix 3a

Self-Administrated Questionnaire

"Design Solutions for Maternity Wear in Public Healthcare Hospitals"

Researcher: Ms. Dhruvika Patel, Sr. MSc. (F.C. Sc).

Department/Faculty: Clothing and Textiles, Family and Community Sciences

University: The Maharaja Sayajirao University of Baroda, Vadodara

Guide: Dr. Reena Bhatia

The below mentioned survey is undertaken as a part of my research entitled 'Design solutions for maternity wear in public health care hospitals' Guided by Dr. Reena Bhatia. There in you are selected as the respondent to give your opinion share your experience regarding to fulfil one of my objectives does listed below.

Thank you for participating in this research study. Your input will help improve maternity wear designs for public healthcare hospitals.

Objective:

- To identify the need and preference of pregnant women in public healthcare hospital

Section 1: Demographic Information

1. Hospital Name:

- GMERS Hospital SSG Hospital

2. Participation's Name: _____

3. Bust Girth: _____

4. Birth Year: _____

5. Is this your first delivery?

- Yes No

6. Which category best describes you?

- Rural Urban
 Migrant Resident
 C-section Normal

Section 2: Maternity Wear Experience of clothing provided by the PHC

1. How long have you been wear maternity clothes during your current or previous pregnancy?

- One day Two day Three day More than three days

2. What types of maternity clothes have you worn? (Select all that apply)

- Tops & Bottoms One piece Other (please specify)



3. How satisfied is you with the current maternity clothes?

- Very satisfied Somewhat dissatisfied Very dissatisfied

4. What features do you like/dislike about current maternity wear?

Section 3: Comfort and Practicality

Past Experience	Current Preferences
<p>1. What features did you prioritize in your previous maternity clothes? (Select all that apply)</p> <p><input type="checkbox"/> Comfort <input type="checkbox"/> Breath-ability <input type="checkbox"/> Support <input type="checkbox"/> Accessibility <input type="checkbox"/> Style <input type="checkbox"/> Durability <input type="checkbox"/> Other (please specify): _____</p> <p>2. How important was comfort in your previous maternity wear choices?</p> <p><input type="checkbox"/> Most important <input type="checkbox"/> Somewhat important <input type="checkbox"/> Not at all important</p> <p>3. Did you face any discomfort or difficulties with your previous maternity clothes?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>1. What features do you currently look for in maternity clothes? (Select all that apply)</p> <p><input type="checkbox"/> Comfort <input type="checkbox"/> Breath-ability <input type="checkbox"/> Support <input type="checkbox"/> Accessibility <input type="checkbox"/> Style <input type="checkbox"/> Durability <input type="checkbox"/> Other (please specify): _____</p> <p>2. How important is comfort in your current maternity wear preferences?</p> <p><input type="checkbox"/> Most important <input type="checkbox"/> Somewhat important <input type="checkbox"/> Not at all important</p> <p>3. What features would improve the comfort of your current maternity wear?</p> <p>----- -----</p>

Section 4: Design Preferences

Past Experience	Current Preferences
<p>1. What design features were most important in your previous maternity wear?</p> <p><input type="checkbox"/> Comfort-focused design (irritation)</p> <p><input type="checkbox"/> Easy to wear and remove</p> <p><input type="checkbox"/> Beautiful</p> <p><input type="checkbox"/> Other (please specify): _____</p>	<p>1. What design features do you prioritize in current maternity wear?</p> <p><input type="checkbox"/> Comfort-focused design (irritation)</p> <p><input type="checkbox"/> Easy to wear and remove</p> <p><input type="checkbox"/> Beautiful</p> <p><input type="checkbox"/> Other (please specify): _____</p>
<p>2. What functional features did you prioritize in past maternity wear? (Select up to 2)</p> <p><input type="checkbox"/> Snap-on shoulders</p> <p><input type="checkbox"/> Front zipper</p> <p><input type="checkbox"/> Easy-to-nurse design</p> <p><input type="checkbox"/> Stretchable fabric</p> <p><input type="checkbox"/> Adjustable straps</p> <p><input type="checkbox"/> Breathable fabric</p> <p><input type="checkbox"/> Other (please specify): _____</p>	<p>2. What functional features do you require in current maternity wear? (Select up to 2)</p> <p><input type="checkbox"/> Snap-on shoulders</p> <p><input type="checkbox"/> Front zipper</p> <p><input type="checkbox"/> Easy-to-nurse design</p> <p><input type="checkbox"/> Stretchable fabric</p> <p><input type="checkbox"/> Adjustable straps</p> <p><input type="checkbox"/> Breathable fabric</p> <p><input type="checkbox"/> Other (please specify): _____</p>

Section 5: Fabric Selection Criteria

Section	Questions	Past Experience	Current Preferences
Fabric Selection	What factors were/are important when choosing fabric? (Choose 3)	<input type="checkbox"/> Comfort <input type="checkbox"/> Durability <input type="checkbox"/> Breath-ability <input type="checkbox"/> Sustainability <input type="checkbox"/> Cost <input type="checkbox"/> (looks good) <input type="checkbox"/> Hygiene <input type="checkbox"/> Softness <input type="checkbox"/> Easy to clean <input type="checkbox"/> Stretch-ability <input type="checkbox"/> Other: _____	<input type="checkbox"/> Comfort <input type="checkbox"/> Durability <input type="checkbox"/> Breath-ability <input type="checkbox"/> Sustainability <input type="checkbox"/> Cost <input type="checkbox"/> (looks good) <input type="checkbox"/> Hygiene <input type="checkbox"/> Softness <input type="checkbox"/> Easy to clean <input type="checkbox"/> Stretch-ability <input type="checkbox"/> Other: _____
	What fabrics did/do you use the most?	<input type="checkbox"/> Cotton <input type="checkbox"/> Polyester <input type="checkbox"/> Blended fabrics <input type="checkbox"/> Other _____	<input type="checkbox"/> Cotton <input type="checkbox"/> Polyester <input type="checkbox"/> Blended fabrics <input type="checkbox"/> Other: _____

	What fabrics did/do you use the most?	<input type="checkbox"/> Woven Fabric <input type="checkbox"/> Knitted <input type="checkbox"/> Nonwoven	<input type="checkbox"/> Woven Fabric <input type="checkbox"/> Knitted <input type="checkbox"/> Nonwoven
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Section 6: Additional Design Preferences

Category	Questions	Past Experience	Current Preferences
Silhouette	What type of silhouettes did you use?	<input type="checkbox"/> Loose and flowing <input type="checkbox"/> Fitted to body shape <input type="checkbox"/> A-line (flared from the waist) <input type="checkbox"/> Empire waist (high waistline just below the bust) <input type="checkbox"/> Other	<input type="checkbox"/> Loose and flowing <input type="checkbox"/> Fitted to body <input type="checkbox"/> A-line (flared from the waist) <input type="checkbox"/> Empire waist (high waistline just below the bust) <input type="checkbox"/> Other
Neckline	What types of necklines did you use?	<input type="checkbox"/> Round neck <input type="checkbox"/> V-neck <input type="checkbox"/> Square neck <input type="checkbox"/> High neck <input type="checkbox"/> Keyhole neck <input type="checkbox"/> Other	<input type="checkbox"/> Round neck <input type="checkbox"/> V-neck <input type="checkbox"/> Square neck <input type="checkbox"/> High neck <input type="checkbox"/> Keyhole neck <input type="checkbox"/> Other
Sleeves	What types of sleeves did you use?	<input type="checkbox"/> Sleeveless <input type="checkbox"/> Short sleeves <input type="checkbox"/> Long sleeves <input type="checkbox"/> 3/4 sleeves <input type="checkbox"/> Clothes with adjustable sleeves <input type="checkbox"/> Other	<input type="checkbox"/> Sleeveless <input type="checkbox"/> Short sleeves <input type="checkbox"/> Long sleeves <input type="checkbox"/> 3/4 sleeves <input type="checkbox"/> Clothes with adjustable sleeves <input type="checkbox"/> Other
Length	What lengths did you use?	<input type="checkbox"/> Knee-length <input type="checkbox"/> Mid-calf length <input type="checkbox"/> Full length <input type="checkbox"/> Above the knee <input type="checkbox"/> Other	<input type="checkbox"/> Knee-length <input type="checkbox"/> Mid-calf length <input type="checkbox"/> Full length <input type="checkbox"/> Above the knee <input type="checkbox"/> Other
Pattern	What patterns did you use?	<input type="checkbox"/> Solid colors <input type="checkbox"/> Stripes <input type="checkbox"/> Floral designs <input type="checkbox"/> Geometric patterns <input type="checkbox"/> Polka dots <input type="checkbox"/> Other	<input type="checkbox"/> Solid colors <input type="checkbox"/> Stripes <input type="checkbox"/> Floral designs <input type="checkbox"/> Geometric patterns <input type="checkbox"/> Polka dots <input type="checkbox"/> Other
	What pattern placement did you use?	<input type="checkbox"/> Small repeats <input type="checkbox"/> Large repeats <input type="checkbox"/> Random placement	<input type="checkbox"/> Small repeats <input type="checkbox"/> Large repeats <input type="checkbox"/> Random placement
	What Color palettes did you use?	<input type="checkbox"/> Light and neutral colors (such as white, beige, pastel) <input type="checkbox"/> Bright and bold colors (such as red, green)	<input type="checkbox"/> Light and neutral colors (such as white, beige, pastel) <input type="checkbox"/> Bright and bold colors (such as red, green)

		<input type="checkbox"/> Soft and calm tones (such as light pink, lavender, mint) <input type="checkbox"/> Dark tones (such as black, navy, charcoal)	<input type="checkbox"/> Soft and calm tones (such as light pink, lavender, mint) <input type="checkbox"/> Dark tones (such as black, navy, charcoal)
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Section 7: Open-Ended Questions

1. What changes would you suggest for maternity wear design?

(Select all that apply)

- More comfortable and supportive designs
- More styles and options to choose from
- Better fitting for changing body shapes
- Easier breastfeeding access
- Better quality and longer-lasting clothes
- More affordable options
- Other (please specify): _____

2. Have you experienced any challenges with maternity wear?

(Select all that apply)

- Hard to find comfortable clothes
- Limited style options
- Poor quality or clothes don't last long
- Not enough support for pregnancy changes
- Hard to find clothes that fit after pregnancy
- Other (please specify): _____

3. How can maternity wear design better meet your needs?

(Select all that apply)

- Include medical advice for better support
- Test clothes for comfort and practicality
- Offer adjustable designs to fit different body shapes
- Give advice on how to choose the right size and care for clothes
- Offer more size options for all body types
- Other (please specify): _____

4. What is your preferred fabric weight for maternity wear?

(Select one)

- Lightweight (e.g., cotton, silk)
- Mid-weight (e.g., blends, knits)
- Heavyweight (e.g., denim, thick knits)

5. How important is sustainability (long lasting) in your fabric selection?

- Very important
- Somewhat unimportant
- Not important

6. Opening of the garment? _____ Front Back Side

7. Any suggestion:

THANK YOU FOR PARTICIPATING

Appendix 3b

સ્વ-સંચાલિત પ્રશ્નાવલી

"પબ્લિક હેલ્થકેર હોસ્પિટલ્સમાં મેટરનિટી વેર માટે ડિઝાઇન સોલ્યુશન્સ"

સંશોધક: શ્રીમતી ધ્રુવિકા પટેલ, સિનિયર એમ.એસસી. વિદ્યાર્થી

વિભાગ: કપડાં અને ટેક્સટાઇલ્સ, ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ

યુનિવર્સિટી: મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ બરોડા, વડોદરા

માર્ગદર્શક: ડો. રીના ભાટિયા

નીચે જણાવેલ સર્વેમારા શોધ કાર્ય "પબ્લિક હેલ્થકેર હોસ્પિટલ્સમાં માતૃત્વ કપડાં માટે ડિઝાઇન સોલ્યુશન્સ" અંતર્ગત કરાવાયેલ છે, જેનું માર્ગદર્શન ડો. રીનાબહેન ભાટિયા દ્વારા આપવામાં આવેલ છે. તમે એ પ્રતિવાદી તરીકે પસંદ કરવામાં આવ્યા છો, જેથી તમારી સૂચનો અને અનુભવ શેર કરી શકો જે મારા નિશ્ચિત લક્ષ્યને પુરો પાડે છે, જે નીચે દર્શાવવામાં આવ્યું છે.

આ સંશોધનમાં ભાગ લેવા માટે આપનો આભાર. આપનો યોગદાન પબ્લિક હેલ્થકેર હોસ્પિટલ્સ માટે માતૃત્વ કપડાંના ડિઝાઇનને સુધારવામાં મદદરૂપ થશે.

લક્ષ્ય:

- પબ્લિક હેલ્થકેર હોસ્પિટલ્સમાં ગર્ભવતી મહિલાઓની જરૂરિયાત અને પસંદગીને ઓળખવું

વિભાગ 1: વસ્તી વિષયક માહિતી

1. હોસ્પિટલનું નામ: GMERS હોસ્પિટલ SSG હોસ્પિટલ
2. ભાગીદારીનું નામ: _____
3. બસ્ટનું માપ _____
4. જન્મ વર્ષ: _____
5. શું આ તમારી પહેલી ડિલિવરી છે? હા નહીં
6. કયું વર્ગ શ્રેણી તમારા માટે શ્રેષ્ઠ વર્ણવે છે?
 1. ગ્રામિણ શહેરી
 2. સ્થાનિક માઇગ્રન્ટ
 3. સી-સેક્શન સામાન્ય

વિભાગ 2: જાહેર આરોગ્ય કેએર હોસ્પિટલ દ્વારા પ્રદાન કરેલા ગર્ભાવસ્થાના વસ્ત્રોના અનુભવ

1. તમે તમારા વર્તમાન અથવા ભૂતકાળના ગર્ભાવસ્થામાં કેટલા દિવસો સુધી ગર્ભાવસ્થાના કપડાં પહેર્યા છો?
 એક દિવસ બે દિવસ ત્રણ દિવસ ત્રણથી વધુ દિવસ
2. તમે કયા પ્રકારના ગર્ભાવસ્થાના વસ્ત્રો પહેર્યા છો? (તમામ લાગુ પડે છે)

ટોપ અને બોટમ્સ

 વન પીસ

 બીજું (ફૂપા કરી દર્શાવો) _____


3. તમે વર્તમાન ગર્ભાવસ્થાના વસ્ત્રોથી કેટલા સંતુષ્ટ છો?

 ખૂબ સંતુષ્ટ થોડા નિરાશ ખૂબ નિરાશ

4. તમે વર્તમાન ગર્ભાવસ્થાના વસ્ત્રોના કયા લક્ષણોને પસંદ કરો છો અથવા પસંદ નથી?

વિભાગ 3: આરામ અને વ્યવહારતા

ભૂતકાળનો અનુભવ	વર્તમાન પસંદગીઓ
<p>1. તમારા ભૂતકાળના ગર્ભાવસ્થાના કપડાંમાં આરામ કેટલું મહત્વનું હતું?</p> <input type="checkbox"/> અતિ મહત્વપૂર્ણ <input type="checkbox"/> થોડું મહત્વપૂર્ણ <input type="checkbox"/> બિલકુલ મહત્વપૂર્ણ નથી <p>2. શું તમે તમારા ભૂતકાળના ગર્ભાવસ્થાના વસ્ત્રો સાથે ક્રીયાઈ અથવા મુશ્કેલીઓનો સામનો કર્યો હતો?</p> <input type="checkbox"/> હા <input type="checkbox"/> નહીં <p>3. તમે હવે ગર્ભાવસ્થાના વસ્ત્રો માટે કયા લક્ષણોને પ્રાધાન્ય આપતા હો? (તમામ લાગુ પડે છે)</p> <input type="checkbox"/> આરામ <input type="checkbox"/> હવામાન પ્રવાહ <input type="checkbox"/> સમર્થન <input type="checkbox"/> સુલભતા <input type="checkbox"/> શૈલી <input type="checkbox"/> ટકાઉપણું <input type="checkbox"/> બીજું (ફૂપા કરી દર્શાવો):	<p>1. તમારા ભૂતકાળના ગર્ભાવસ્થાના કપડાંમાં આરામ કેટલું મહત્વનું હતું?</p> <input type="checkbox"/> અતિ મહત્વપૂર્ણ <input type="checkbox"/> થોડું મહત્વપૂર્ણ <input type="checkbox"/> બિલકુલ મહત્વપૂર્ણ નથી <p>2. શું તમે તમારા ભૂતકાળના ગર્ભાવસ્થાના વસ્ત્રો સાથે ક્રીયાઈ અથવા મુશ્કેલીઓનો સામનો કર્યો હતો?</p> <input type="checkbox"/> હા <input type="checkbox"/> નહીં <p>3. તમે હવે ગર્ભાવસ્થાના વસ્ત્રો માટે કયા લક્ષણોને પ્રાધાન્ય આપતા હો? (તમામ લાગુ પડે છે)</p> <input type="checkbox"/> આરામ <input type="checkbox"/> હવામાન પ્રવાહ <input type="checkbox"/> સમર્થન <input type="checkbox"/> સુલભતા <input type="checkbox"/> શૈલી <input type="checkbox"/> ટકાઉપણું <input type="checkbox"/> બીજું (ફૂપા કરી દર્શાવો):

વિભાગ 4: ડિઝાઇન પસંદગીઓ

ભૂતકાળનો અનુભવ	વર્તમાન પસંદગીઓ
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<p>1. તમારા અગાઉના ગર્ભાવસ્થા વસ્ત્રોમાં કયા ડિઝાઇન ફીચર્સ મહત્વપૂર્ણ હતા?</p> <p><input type="checkbox"/> આરામ-કેન્દ્રિત ડિઝાઇન (જ્યાં તે ખચકાવું ન કરે)</p> <p><input type="checkbox"/> પહેરવા અને ઉતારવામાં સરળ</p> <p><input type="checkbox"/> સુંદર</p> <p><input type="checkbox"/> અન્ય (ફૂલા કરીને સ્પષ્ટ કરો):</p> <p>_____</p>	<p>1. વર્તમાન ગર્ભાવસ્થા વસ્ત્રોમાં તમે કયા ડિઝાઇન ફીચર્સને મહત્વ આપો છો?</p> <p><input type="checkbox"/> આરામ-કેન્દ્રિત ડિઝાઇન (જ્યાં તે ખચકાવું ન કરે)</p> <p><input type="checkbox"/> પહેરવા અને ઉતારવામાં સરળ</p> <p><input type="checkbox"/> સુંદર</p> <p><input type="checkbox"/> અન્ય (ફૂલા કરીને સ્પષ્ટ કરો):</p> <p>_____</p>
<p>2. તમારા અગાઉના ગર્ભાવસ્થા વસ્ત્રોમાં કયા કાર્યક્ષમ ફીચર્સ મહત્વપૂર્ણ હતા?</p> <p><input type="checkbox"/> સ્નેપ-ઓન શોલ્ડર</p> <p><input type="checkbox"/> આગળનો ઝિપ</p> <p><input type="checkbox"/> આસાનીથી બાલ બાળક પોષણ માટે ડિઝાઇન</p> <p><input type="checkbox"/> લવચીક કાપડ</p> <p><input type="checkbox"/> એડજસ્ટેબલ પટ્ટા</p> <p><input type="checkbox"/> શ્વસનક્ષમ કાપડ</p> <p><input type="checkbox"/> અન્ય (ફૂલા કરીને સ્પષ્ટ કરો):</p> <p>_____</p>	<p>3. વર્તમાન ગર્ભાવસ્થા વસ્ત્રોમાં તમે કયા કાર્યક્ષમ ફીચર્સ માંગો છો?</p> <p><input type="checkbox"/> સ્નેપ-ઓન શોલ્ડર</p> <p><input type="checkbox"/> આગળનો ઝિપ</p> <p><input type="checkbox"/> આસાનીથી બાલ બાળક પોષણ માટે ડિઝાઇન</p> <p><input type="checkbox"/> લવચીક કાપડ</p> <p><input type="checkbox"/> એડજસ્ટેબલ પટ્ટા</p> <p><input type="checkbox"/> શ્વસનક્ષમ કાપડ</p> <p><input type="checkbox"/> અન્ય (ફૂલા કરીને સ્પષ્ટ કરો):</p> <p>_____</p>

વિભાગ 5: કાપડ પસંદગીના માપદંડ

વિભાગ	પ્રશ્નો	ભૂતકાળનો અનુભવ	વર્તમાન પસંદગીઓ
કાપડ પસંદગી	તમારા માટે કાપડ પસંદ કરતી વખતે કયા ફેક્ટર મહત્વપૂર્ણ હતા/છે? (૩ પસંદ કરો)	<input type="checkbox"/> આરામ <input type="checkbox"/> ટકાઉપણું <input type="checkbox"/> શ્વસનક્ષમતા <input type="checkbox"/> સસ્ટેનેબિલિટી <input type="checkbox"/> કિંમત <input type="checkbox"/> સુંદર દેખાવ) <input type="checkbox"/> સ્વચ્છતા <input type="checkbox"/> નરમાઈ <input type="checkbox"/> સાફ કરવા માટે સરળ <input type="checkbox"/> વિસ્તરણશીલતા <input type="checkbox"/> અન્ય	<input type="checkbox"/> આરામ <input type="checkbox"/> ટકાઉપણું <input type="checkbox"/> શ્વસનક્ષમતા <input type="checkbox"/> સસ્ટેનેબિલિટી <input type="checkbox"/> કિંમત <input type="checkbox"/> સુંદર દેખાવ <input type="checkbox"/> સ્વચ્છતા <input type="checkbox"/> નરમાઈ <input type="checkbox"/> સાફ કરવા માટે સરળ <input type="checkbox"/> વિસ્તરણશીલતા <input type="checkbox"/> અન્ય
	તમારા દ્વારા સૌથી વધુ ઉપયોગમાં	<input type="checkbox"/> કોટન <input type="checkbox"/> પોલીસ્ટર <input type="checkbox"/> મિશ્રિત કાપડ	<input type="checkbox"/> કોટન <input type="checkbox"/> પોલીસ્ટર <input type="checkbox"/> મિશ્રિત કાપડ

	લેવાતા કાપડ કયા હતા/છે?	<input type="checkbox"/> અન્ય _____	<input type="checkbox"/> અન્ય _____
	તમારા દ્વારા સૌથી વધુ ઉપયોગમાં લેવાતા કાપડના પ્રકાર કયા હતા/છે?	<input type="checkbox"/> વણાયેલું કાપડ <input type="checkbox"/> નટેડ કાપડ <input type="checkbox"/> અવણ-વણાયેલું કાપડ	<input type="checkbox"/> વણાયેલું કાપડ <input type="checkbox"/> નટેડ કાપડ <input type="checkbox"/> અવણ-વણાયેલું કાપડ

વિભાગ 6: વધારાની ડિઝાઇન પસંદગીઓ

વિભાગ	પ્રશ્નો	ભૂતકાળનો અનુભવ	વર્તમાન પસંદગીઓ
સિલોયેટ આકૃતિ (પોશાકના સંપૂર્ણ આકાર):	તમે કયા પ્રકારના સિલોયેટનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> ઢીલા અને વહેતા <input type="checkbox"/> શારીરિક આકૃતિને અનુરૂપ પરંતુ આરામદાયક <input type="checkbox"/> A-લાઇન (કમરથી ફેલાતું) <input type="checkbox"/> એમ્પાયર વેસ્ટ (ઉચ્ચ કમરનો રેખાંકન છાતીના તળિયે) <input type="checkbox"/> અન્ય _____	<input type="checkbox"/> ઢીલા અને વહેતા <input type="checkbox"/> શારીરિક આકૃતિને અનુરૂપ પરંતુ આરામદાયક <input type="checkbox"/> A-લાઇન (કમરથી ફેલાતું) <input type="checkbox"/> એમ્પાયર વેસ્ટ (ઉચ્ચ કમરનો રેખાંકન છાતીના તળિયે) <input type="checkbox"/> અન્ય _____
નેકલાઇન ગળાનો અંદાજ:	તમે કયા પ્રકારના નેકલાઇનનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> ગોળ ગળા <input type="checkbox"/> V-નેક <input type="checkbox"/> ચોરસ ગળા <input type="checkbox"/> ઊંચો ગળા <input type="checkbox"/> કીડોલ ગળા <input type="checkbox"/> અન્ય _____	<input type="checkbox"/> ગોળ ગળા <input type="checkbox"/> V-નેક <input type="checkbox"/> ચોરસ ગળા <input type="checkbox"/> ઊંચો ગળા <input type="checkbox"/> કીડોલ ગળા <input type="checkbox"/> અન્ય _____
સ્લીવ્સ	તમે કયા પ્રકારના સ્લીવ્સનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> વિના બાંયનો <input type="checkbox"/> ટૂંકા બાંય <input type="checkbox"/> લાંબા બાંય <input type="checkbox"/> 3/4 બાંય <input type="checkbox"/> કપડાંવાળી અથવા એડજસ્ટેબલ બાંય <input type="checkbox"/> અન્ય _____	<input type="checkbox"/> વિના બાંયનો <input type="checkbox"/> ટૂંકા બાંય <input type="checkbox"/> લાંબા બાંય <input type="checkbox"/> 3/4 બાંય <input type="checkbox"/> કપડાંવાળી અથવા એડજસ્ટેબલ બાંય <input type="checkbox"/> અન્ય _____
લંબાઈ	તમે કયા પ્રકારની લંબાઈનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> ઘૂંટણ સુધી <input type="checkbox"/> મધ્યમ કાલ્ફ લાંબાઈ <input type="checkbox"/> સંપૂર્ણ લાંબાઈ <input type="checkbox"/> ઘૂંટણની ઉપર <input type="checkbox"/> અન્ય _____	<input type="checkbox"/> ઘૂંટણ સુધી <input type="checkbox"/> મધ્યમ કાલ્ફ લાંબાઈ <input type="checkbox"/> સંપૂર્ણ લાંબાઈ <input type="checkbox"/> ઘૂંટણની ઉપર <input type="checkbox"/> અન્ય _____
પેટર્ન	તમે કયા પ્રકારના પેટર્નનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> સોલિડ રંગો <input type="checkbox"/> સ્ટ્રિપ્સ <input type="checkbox"/> ફૂલના ડિઝાઇન <input type="checkbox"/> ભૂમિતિના પેટર્ન <input type="checkbox"/> પોલકાડોટ્સ	<input type="checkbox"/> સોલિડ રંગો <input type="checkbox"/> સ્ટ્રિપ્સ <input type="checkbox"/> ફૂલના ડિઝાઇન <input type="checkbox"/> ભૂમિતિના પેટર્ન <input type="checkbox"/> પોલકાડોટ્સ

		<input type="checkbox"/> અન્ય	<input type="checkbox"/> અન્ય
	તમે કયા પ્રકારના પેટર્ન પ્લેસમેન્ટનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> નાની પુનરાવૃત્તિ <input type="checkbox"/> મોટી પુનરાવૃત્તિ <input type="checkbox"/> રેન્ડમ પ્લેસમેન્ટ	<input type="checkbox"/> નાની પુનરાવૃત્તિ <input type="checkbox"/> મોટી પુનરાવૃત્તિ <input type="checkbox"/> રેન્ડમ પ્લેસમેન્ટ
ક્લર પેલેટ	તમે કયા પ્રકારના ક્લર પેલેટનો ઉપયોગ કર્યો છે?	<input type="checkbox"/> હળવા અને ન્યુટ્રલ રંગો (જેમ કે સફેદ, બેઝ, પેસ્ટલ) <input type="checkbox"/> તેજસ્વી અને બોલ્ડ રંગો (જેમ કે લાલ, લીલો) <input type="checkbox"/> નરમ અને શાંત ટોન (જેમ કે હળવા ગુલાબી, લાવંડર, મિન્ટ) <input type="checkbox"/> ગાઢ ટોન (જેમ કે કાળો, નેવી, ચારકોલ)	<input type="checkbox"/> હળવા અને ન્યુટ્રલ રંગો (જેમ કે સફેદ, બેઝ, પેસ્ટલ) <input type="checkbox"/> તેજસ્વી અને બોલ્ડ રંગો (જેમ કે લાલ, લીલો) <input type="checkbox"/> નરમ અને શાંત ટોન (જેમ કે હળવા ગુલાબી, લાવંડર, મિન્ટ) <input type="checkbox"/> ગાઢ ટોન (જેમ કે કાળો, નેવી, ચારકોલ)

વિભાગ 7: ખુલ્લા પ્રશ્નો

1. પ્રસૂતિ વસ્ત્રોની ડિઝાઇન માટે તમે કયા ફેરફારો સૂચવશો?

- | | |
|--|---|
| <input type="checkbox"/> વધુ આરામદાયક અને સહાયક ડિઝાઇન વધુ વિવિધતા | <input type="checkbox"/> શૈલીઓ અને સિલુએટ્સની |
| <input type="checkbox"/> શરીરના આકારો બદલવા માટે સુધારેલ એડજસ્ટિબિલિટી | <input type="checkbox"/> ઉન્નત સ્તનપાન સુલભતા |
| <input type="checkbox"/> વધુ સારી ગુણવત્તા અને ટકાઉપણું | <input type="checkbox"/> વધુ પોસાય તેવા વિકલ્પો |
| <input type="checkbox"/> અન્ય (ફૂપા કરીને સ્પષ્ટ કરો) _____ | |

2. શું તમે પ્રસૂતિ વસ્ત્રો સાથે કોઈ પડકારોનો અનુભવ કર્યો છે?

- | | |
|--|--|
| <input type="checkbox"/> આરામદાયક કપડાં શોધવામાં મુશ્કેલી | <input type="checkbox"/> મર્યાદિત શૈલી વિકલ્પો |
| <input type="checkbox"/> નબળી ગુણવત્તા અથવા ટકાઉપણું અપૂરતો આધાર | <input type="checkbox"/> ગર્ભાવસ્થા સંબંધિત ફેરફારો માટે |
| <input type="checkbox"/> ગર્ભાવસ્થા પછી બંધબેસતા કપડાં શોધવામાં મુશ્કેલી | <input type="checkbox"/> અન્ય _____ |

3. પ્રસૂતિ વસ્ત્રોની ડિઝાઇન દર્દીની જરૂરિયાતોને વધુ સારી રીતે કેવી રીતે પૂરી કરી શકે?

- | | |
|---|---|
| <input type="checkbox"/> તબીબી કુશળતા માટે સહાયક ડિઝાઇન પરીક્ષણ | <input type="checkbox"/> આરામ અને વ્યવહારિકતા માટે પહેરનારનું |
| <input type="checkbox"/> વૈવિધ્યપૂર્ણ અથવા એડજસ્ટેબલ ડિઝાઇન | <input type="checkbox"/> યોગ્ય ફિટ અને સંભાળ પર શિક્ષણ |
| <input type="checkbox"/> સાઇઝ રેન્જ અને સમાવેશ વિસ્તૃત કરવો | <input type="checkbox"/> અન્ય (ફૂપા કરીને સ્પષ્ટ કરો) |

4. પ્રસૂતિ વસ્ત્રો માટે તમારું પસંદગીનું ફેબ્રિક વજન શું છે?

- | | | |
|---|--|--|
| <input type="checkbox"/> લાઇટવેઇટ (દા.ત., કોટન, રેશમ) | <input type="checkbox"/> મધ્યમ વજન (દા.ત., મિશ્રણો, નીટ) | <input type="checkbox"/> હેવીવેઇટ (દા.ત., ડેનિમ, જાડા નીટ) |
|---|--|--|

5.તમારા કપડાની પસંદગીમાં ટકાઉપણું (દીર્ઘકાલિક) કેટલું મહત્વપૂર્ણ ?

ખૂબ મહત્વપૂર્ણ તટસ્થ મહત્વપૂર્ણ નથી

6.વસ્ત્રનું ખુલવાનું સ્થાન? _____ આગળ પાછળ બાજુ

7.સલાહ આપો:

ભાગ લેવા બદલ તમારો આભાર

Appendix 4a

Interview Schedule with Healthcare Provider

Research Study: Design Solutions for Maternity Wear in Public Healthcare Hospitals

Researcher: Ms. Dhruvika Patel, Senior M. Sc. Student

Department/Faculty: Clothing and Textiles, Faculty of Family and Community Sciences

University: The Maharaja Sayajirao University of Baroda, Vadodara

Guide: Dr. Reena Bhatia

Thank you for agreeing to participate in this research study. Your suggestions and experiences will play a key role in improving maternity wear for public healthcare hospitals.

The goal of this study is to explore the design preferences and requirements for maternity clothing. I aim to understand how these designs impact patients, support healthcare providers, and align with hospital policies. Your insights are invaluable in developing practical and effective solutions.

Participation in this survey is entirely voluntary, and you are free to withdraw at any time without any consequences. Rest assured, all the information you provide will be kept strictly confidential and anonymous. Your name or any identifying details will not appear in any reports or publications.

I appreciate your time and contribution to this important research.

Section 1: Demographic Information

- Hospital Name:** GMERS Hospital SSG Hospital
- Participation's name:** _____
- What is your profession?**
 Obstetrician/Gynaecologist Nurse (RN, NP, etc.) Care givers
 Midwife Trainee Doctor Other _____
- Years of experience?** Less than 1 year 1-3 years 4-7 years 8+ years
- Gender?** Male Female Non-binary/Other
- Admission Frequency per day:** _____

Section 2: Clinical Experience and Observations

- Does your hospital provide maternity wear for patients?** Yes No

2. Does your hospital provide maternity wear for patients? If yes, how would you evaluate its quality and effectiveness? If no, do you think providing maternity wear would benefit patients, and what challenges might the hospital face in doing so?

<p>a) Yes, we provide maternity wear. It is:</p> <p><input type="checkbox"/> Excellent quality (comfortable, durable, functional)</p> <p><input type="checkbox"/> Good quality (meets basic needs)</p> <p><input type="checkbox"/> Needs improvement</p> <p><input type="checkbox"/> Poor quality</p>	<p>b) No, the hospital does not provide maternity wear, but I believe it would benefit patients because:</p> <p><input type="checkbox"/> It would improve comfort and recovery</p> <p><input type="checkbox"/> It would make care more efficient for healthcare providers</p> <p><input type="checkbox"/> It would enhance patient satisfaction</p>
<p>c) Challenges faced in providing maternity wear:</p> <p><input type="checkbox"/> Budget and financial constraints</p> <p><input type="checkbox"/> Lack of suitable designs or materials</p> <p><input type="checkbox"/> Difficulty in managing hygiene and cleaning</p> <p><input type="checkbox"/> No significant demand from patients</p> <p><input type="checkbox"/> Other (please specify) _____</p>	

3. What is your experience with postpartum care, and how often do you interact with new mothers?

- Daily Weekly Monthly Rarely

4. Have you observed any common challenges or discomforts faced by postpartum women regarding their clothing?

- Discomfort unsatisfactory support Limited mobility
- Difficulty breastfeeding Modesty (coverage, privacy) Other _____

5. How do you think maternity wear can impact a woman's physical and emotional recovery postpartum?

- Significant impact Minimal impact No impact

6. Have you observed any issues with the current maternity wear in terms of:

- Patient mobility (difficult to move) Patient comfort (itchy, tight, etc.)
- Usability (difficult to wear or remove) Hygiene (difficult to clean)
- No issues observed Other _____

7. If hospital provide maternity wear, how do you launder your current maternity wear?

<p>Machine Washing</p> <p><input type="checkbox"/> Regular machine wash with detergent</p> <p><input type="checkbox"/> Gentle machine wash with mild detergent</p>	<p>Hand Washing</p> <p><input type="checkbox"/> Hand wash in cold water</p> <p><input type="checkbox"/> Hand wash in warm water</p> <p><input type="checkbox"/> Soak and then hand wash</p>
---	--

<input type="checkbox"/> Hand-wash cycle on machine <input type="checkbox"/> Delicate/lingerie cycle on machine	
Drying Methods <input type="checkbox"/> Tumble dry on low heat <input type="checkbox"/> Air dry/line dry <input type="checkbox"/> Dry flat	Special Care <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Steam cleaning <input type="checkbox"/> Special stain removal treatments
What are the typical laundry and maintenance procedures in public healthcare hospitals? <input type="checkbox"/> Centralized laundry service <input type="checkbox"/> On-site laundry facilities <input type="checkbox"/> Contracted laundry services <input type="checkbox"/> Hand washing <input type="checkbox"/> Other (please specify)	Frequency <input type="checkbox"/> Wash after every wear <input type="checkbox"/> Wash every 2-3 wears <input type="checkbox"/> Wash weekly

Section 3: Effectiveness of Current Maternity Wear

1. What are your thoughts on the current maternity wear available for postpartum women?

Very satisfied Neutral Very dissatisfied

2. Do you think current maternity wear effectively addresses postpartum recovery needs? Why or why not?

Yes, very effectively Somewhat effectively Not at all effectively

Why or why not? (Select all that apply)

Lack of comfort Insufficient support Limited styles/options
 Poor quality materials Other (please specify)

3. Have you seen any specific features or designs that you believe are particularly effective or ineffective?

Effective features:

Adjustable waistbands Built-in support Comfortable fabrics
 Other _____

Ineffective features:

Constrictive designs Uncomfortable materials Difficult nursing access
 Lack of support Other (please specify)

Section 4: Ideal Maternity Wear Characteristics

1. What features would you ideally like to see in maternity wear to support postpartum recovery?

Adjustable waistbands Comfortable fabrics Breathable panels
 High-waisted pants Easy nursing access Supportive belly bands
 Other (please specify) _____

2. How important is comfort, support, and practicality in maternity wear for postpartum women?

	Very important	Somewhat important	Not at all important
Comfort:			
Support:			
Practicality:			

3. Are there any specific materials or fabrics you recommend for postpartum maternity wear?

- Cotton Fabric Polyester Fabric Blended Fabric Any other (Specify) _____

Section 5: Impact on Patient Care and Outcomes

1. How does maternity wear impact your ability to provide effective care to postpartum women?

- Significantly positive impact No impact Negative impact

2. Do you think improved maternity wear could lead to better patient satisfaction and reduced hospital re-admissions?

- Strongly agree Somewhat agree Strongly disagree

3. What medical conditions during postpartum require special consideration in maternity wear design? (Select all that apply)

- C-section recovery Breastfeeding support Mobility issues
 Wound care Vaginal delivery recovery Other (please specify)

4. What budget constraints should designs consider?

- 200₹ - 300 ₹ 300₹ -400₹ 400₹ -500₹ More than 500₹ Other _____

5. How important is infection control in maternity wear design?

- Very important Somewhat important Not at all important

6. What is the ideal lifespan for maternity wear?

- 1-3 months 3-6 months 6-12 months More than 12 months

7. Would you consider sustainable materials important in maternity wear design?

- Yes No Unsure

Section 6: What are your preferences regarding the following features of maternity wear in the hospital?

<p>Silhouette (overall shape of the garment):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Loose and flowing <input type="checkbox"/> Fitted but comfortable <input type="checkbox"/> A-line (flared from waist) <input type="checkbox"/> Empire waist (high waistline just under the bust) <input type="checkbox"/> Other (please specify) 	<p>Sleeve Style:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sleeveless <input type="checkbox"/> Short sleeves <input type="checkbox"/> Long sleeves <input type="checkbox"/> 3/4 sleeves <input type="checkbox"/> Sleeves with cuffs or adjustable <input type="checkbox"/> Other (please specify)
<p>Neckline Style:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Round neckline <input type="checkbox"/> V-neck <input type="checkbox"/> Square neckline <input type="checkbox"/> High neckline <input type="checkbox"/> Keyhole neckline <input type="checkbox"/> Other (please specify) 	<p>Color Preference:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Light and neutral colors (e.g., white, beige, pastels) <input type="checkbox"/> Bright and bold colors (e.g., red, blue, green) <input type="checkbox"/> Soft and calm tones (e.g., light pink, lavender, mint) <input type="checkbox"/> Darker tones (e.g., black, navy, charcoal) <input type="checkbox"/> Patterned or printed (e.g., floral, stripes, polka dots)
<p>Length of the Garment:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Knee-length <input type="checkbox"/> Mid-calf length <input type="checkbox"/> Full-length <input type="checkbox"/> Above the knee <input type="checkbox"/> Other (please specify) 	<p>Pattern Preference:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Solid colors <input type="checkbox"/> Stripes <input type="checkbox"/> Floral prints <input type="checkbox"/> Geometric patterns <input type="checkbox"/> Polka dots <input type="checkbox"/> Other (please specify)

Section 7: Open Ended questions

1. What features would you like to see in maternity wear for your patients?

2. Are there existing designs or products you recommend?

3. Is there any colour code in your hospital for maternity wear?

4. What budget constraints should designs consider?

THANK YOU FOR PARTICIPATING

Appendix 4b

હેલ્થકેર પ્રદાતા સાથેનો ઇન્ટરવ્યુ શિડ્યૂલ

શોધ અધ્યયન: પબ્લિક હેલ્થકેર હોસ્પિટલમાં મેટરનિટી વેર માટે ડિઝાઇન સોલ્યુશન્સ

શોધકર્તા: શ્રીમતી ધ્રુવિકા પટેલ, સિનિયર એમ.એસસી. વિદ્યાર્થી

વિભાગ/ફેકલ્ટી: કપડાં અને ટેક્સટાઇલ્સ, ફેમિલી અને કમ્યુનિટી સાયન્સ

યુનિવર્સિટી: મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ વડોદરા, વડોદરા

માર્ગદર્શક: ડૉ. રીના ભાટિયા

આ સંશોધન અભ્યાસમાં ભાગ લેવા બદલ આભાર. જાહેર આરોગ્ય કાળજી માટેના મેટરનિટી વસ્ત્રોને સુધારવામાં તમારા સૂચનો અને અનુભવ મુખ્ય ભૂમિકા ભજવશે. આ અભ્યાસનો હેતુ મેટરનિટી વસ્ત્રોની ડિઝાઇનના પ્રાથમિક પસંદગીઓ અને જરૂરિયાતોને શોધવાનો છે. હું આ ડિઝાઇન દર્દીઓ પર કેવી અસર કરે છે, તે આરોગ્યસંભાળ પ્રદાતાઓને કેવી રીતે ટેકો આપે છે, અને હોસ્પિટલ નીતિઓ સાથે કેવી રીતે સુસંગત છે તે સમજાવશે. પ્રાયોગિક અને અસરકારક ઉકેલો વિકસાવવામાં તમારા સુઝાવ અમૂલ્ય છે.

આ સર્વેમાં ભાગ લેવું સંપૂર્ણપણે સ્વૈચ્છિક છે, અને તમે કોઈપણ સમયે કોઈ પણ પરિણામ વિના પ્રત્યાહર કરી શકો છો. તમે પ્રદાન કરેલી તમામ માહિતી સંપૂર્ણપણે ગોપનીય અને અનામત રાખવામાં આવશે. તમારું નામ અથવા ઓળખ કોઈ પણ રિપોર્ટ અથવા પ્રકાશનમાં ઉલ્લેખવામાં આવશે નહીં.

આ મહત્વપૂર્ણ સંશોધન માટે તમારો સમય અને યોગદાન બદલ હું તમારો આભારી છું.

વિભાગ 1: લોકસાંખ્યિકી માહિતી

1. તમારું વ્યવસાય શું છે?

- સ્ત્રીરોગ નિષ્ણાત / ગાયનેકોલોજિસ્ટ નર્સ (RN, NP વગેરે) કેર ગિવર
 મિડવાઇફ ટ્રેઇની ડૉક્ટર અન્ય: _____

2. અનુભવના વર્ષ:

- 1 વર્ષથી ઓછા 1-3 વર્ષ 4-7 વર્ષ 8+ વર્ષ

3. લિંગ: પુરુષ સ્ત્રી અન્ય

4. દરરોજ દાખલ થનારા દર્દીઓની સંખ્યા: _____

વિભાગ 2: ક્લિનિકલ અનુભવ અને અવલોકનો

1. શું તમારા હોસ્પિટલમાં મેટરનિટી વસ્ત્રો ઉપલબ્ધ છે? હા ના

જો હા, તો આ વસ્ત્રોનું ગુણવત્તા અને કાર્યક્ષમતા કેવી છે?	જો ના, તો તમારા મતે મેટરનિટી વસ્ત્રો ઉપલબ્ધ કરાવવાથી દર્દીઓને શું ફાયદો થઈ શકે?
<input type="checkbox"/> ઉત્તમ ગુણવત્તા <input type="checkbox"/> સારી ગુણવત્તા <input type="checkbox"/> સુધારવાની જરૂર છે <input type="checkbox"/> નબળી ગુણવત્તા	<input type="checkbox"/> આરામ વધે <input type="checkbox"/> કાળજી વધુ કાર્યક્ષમ બને <input type="checkbox"/> દર્દી સંતોષ વધે

આવતી પડકારો:

- | | |
|--|---|
| <input type="checkbox"/> બજેટ મર્યાદા અભાવ | <input type="checkbox"/> યોગ્ય ડિઝાઇન અથવા સામગ્રીનો અભાવ |
| <input type="checkbox"/> સ્વચ્છતા મેનેજમેન્ટમાં મુશ્કેલી | <input type="checkbox"/> દર્દીઓ પાસેથી માંગનો અભાવ |
| <input type="checkbox"/> અન્ય (ફૂપા કરીને જણાવો): | |

2. તમારું પ્રસૂતિ પછીની સંભાળ સાથેનું અનુભવ શું છે, અને તમે નવી માતાઓ સાથે કેટલાં વખત સંપર્કમાં આવો છો?

- દૈનિક સાપ્તાહિક માસિક કદાચ

3. શું તમે જન્મ પછીની સ્ત્રીઓની વસ્ત્રો સંકળાયેલા કોઈ સામાન્ય પડકારો અથવા અસ્વસ્થતા અવલોકિત કરી છે?

- અસ્વસ્થતા મર્યાદિત ગતિચલન સ્તનપાનમાં મુશ્કેલી
 લાગ્ય (કવરેજ, ગોપનીયતા) અન્ય (ફૂપા કરીને સ્પષ્ટ કરો)

4. તમે કેમ માનતા છો કેમેટરનિટી વસ્ત્રો સ્ત્રીની શારીરિક અને ભાવનાત્મક પુનઃપ્રાપ્તિ પર શું અસર કરી શકે છે?

- મહત્વપૂર્ણ અસર ન્યૂનતમ અસર કોઈ અસર નહીં

5. શું તમે હાલના મેટરનિટી વસ્ત્રો સાથે કોઈ સમસ્યાઓ અવલોકિત કરી છે?

- દર્દીની ગતિશીલતા (ખસેડવામાં મુશ્કેલી) દર્દીની આરામદાયકતા (ખંજવાળ, ટકાવટ વગેરે)
 ઉપયોગિતા (પહેરવા અથવા ઉતારવામાં મુશ્કેલી) સ્વચ્છતા (સાફ કરવા મુશ્કેલી)
 કોઈ સમસ્યા નોંધાઈ નથી અન્ય: _____

6. જો હોસ્પિટલ મેટરનિટી વસ્ત્રો આપે તો તમે તમારા હાલના મેટરનિટી વસ્ત્રો કેવી રીતે ધોઈને રાખો છો?

મશીન ધોવા <ul style="list-style-type: none"> <input type="checkbox"/> નિયમિત મશીન ધોવા સાથે ડીટર્જન્ટ <input type="checkbox"/> નમ્ર મશીન ધોવા સાથે માઇલ્ડ ડીટર્જન્ટ <input type="checkbox"/> હેન્ડવોશ સાયકલ પર મશીન <input type="checkbox"/> ડિલિકેટ/વિઝેરી સાયકલ પર મશીન 	હાથથી ધોઈવું <ul style="list-style-type: none"> <input type="checkbox"/> ઠંડા પાણીમાં હાથથી ધોઈવું <input type="checkbox"/> ગરમ પાણીમાં હાથથી ધોઈવું <input type="checkbox"/> સોક કરીને પછી હાથથી ધોઈવું
સૂકાવવાની પદ્ધતિઓ <ul style="list-style-type: none"> <input type="checkbox"/> કમ તાપમાં ટમ્બલ ડ્રાય <input type="checkbox"/> હવા દ્વારા સૂકવવું / લાઇન પર સૂકવવું <input type="checkbox"/> સૂકવવું ફ્લેટ 	વિશેષ કાળજી <ul style="list-style-type: none"> <input type="checkbox"/> ડ્રાય ક્લીનિંગ <input type="checkbox"/> સ્ટીમ ક્લીનિંગ <input type="checkbox"/> વિશેષ ધબકાવ માટેનું વંટોળ
જાહેર આરોગ્યકક્ષાના હોસ્પિટલોમાં સામાન્ય ધોવા અને જાળવણી પ્રક્રિયાઓ શું છે? <ul style="list-style-type: none"> <input type="checkbox"/> કેન્દ્રીય ધોવાની સેવા <input type="checkbox"/> સાઇટ પર ધોવાની સુવિધાઓ <input type="checkbox"/> કોન્ટ્રાક્ટ કરેલી ધોવાની સેવાઓ <input type="checkbox"/> હાથથી ધોવું <input type="checkbox"/> અન્ય (ફૂપા કરીને સ્પષ્ટ કરો) 	સામાન્યતાથી <ul style="list-style-type: none"> <input type="checkbox"/> દરેક પહેરવાથી પછી ધોઈવું <input type="checkbox"/> દરેક 2-3 પહેરવાથી પછી ધોઈવું <input type="checkbox"/> સાપ્તાહિક ધોવું

વિભાગ ૩: મેટરનિટી વસ્ત્રોની અસરકારકતા

૧. હાલમાં ઉપલબ્ધ મેટરનિટી વસ્ત્રો વિશે તમારું મંતવ્ય શું છે?

- ખૂબ સંતોષકારક તટસ્થ ખૂબ અસંતોષકારક

૨. "શું તમારું માનવું છે કે હાલનું મેટરનિટી વસ્ત્ર પ્રસુતિ પછીની સાજા થવાની જરૂરિયાતોને અસરકારક રીતે પૂર્ણ કરે છે? કૃપા કરીને તમારા જવાબ માટે કારણ સમજાવો.

- હા થોડું બધું નહીં

કેમ અથવા કેમ નહિ? (તમારા અનુરૂપ તમામ વિકલ્પ પસંદ કરો)

- આરામની ખોટ અસંતોષકારક આધાર સંમતિ શૈલીઓ/વિકલ્પો
 ખોટી ગુણવત્તાવાળા સામગ્રી અન્ય (કૃપા કરીને સ્પષ્ટ કરો)

૩. શું તમે ખાસ કોઈ વિશિષ્ટ લક્ષણો અથવા ડિઝાઇન જોયાં છે જે તમે માનતા છો કે તે ખાસ અસરકારક અથવા અસરકારક નથી?

a). અસરકારક લક્ષણો:

- એડજસ્ટેબલ વેસ્ટબેન્ડ બિલ્ટ-ઇન સપોર્ટ આરામદાયક ફેબ્રિક અન્ય (કૃપા કરીને સ્પષ્ટ કરો)

b). અસફળ લક્ષણો:

- કનસ્ટ્રિક્ટિવ ડિઝાઇન આરામદાયક સામગ્રી મુશ્કેલ નર્સિંગ પ્રવેશ આધારની ખોટ
 અન્ય _____

ભાગ ૪: આદર્શ માતૃત્વ વસ્ત્રો લક્ષણો

૧. ઓછી જન્મ પછીની પુનઃપ્રાપ્તિ માટે મેટરનિટી વસ્ત્રો માં કયા લક્ષણો તમને આદર્શ રીતે જોવા જોઈએ?

- એડજસ્ટેબલ વેસ્ટબેન્ડ આરામદાયક ફેબ્રિક હાઈ-વેસ્ટેડ પેન્ટ્સ આસાન નર્સિંગ પ્રવેશ સ્વાસ્થ્યપ્રદ પેનલ આધારભૂત બેલી બેન્ડસ અન્ય (કૃપા કરીને સ્પષ્ટ કરો) _____

૨. ઓછી જન્મ પછીની સ્ત્રીઓ માટે મેટરનિટી વસ્ત્રો માં આરામ, આધાર અને વ્યાવહારિકતા કેટલા મહત્વના છે?

	ખૂબ મહત્વપૂર્ણ	થોડું મહત્વપૂર્ણ	થોડું મહત્વપૂર્ણ
આરામ:			
આધાર			
વ્યાવહારિકતા:			

૨. શું તમે જન્મ પછીના મેટરનિટી વસ્ત્રો માટે કોઈ ખાસ સામગ્રી અથવા ફેબ્રિકની ભલામણ કરો છો?

- કોટન ફેબ્રિક પોલીએસ્ટર ફેબ્રિક બ્લેન્ડેડ ફેબ્રિક અન્ય (સ્પષ્ટ કરો)

વિભાગ ૫: દર્દી કાળજી અને પરિણામો પર અસર

૧. માતૃત્વ પોશાક તમારા માટે જન્મ પછીની મહિલાઓને અસરકારક કાળજી પ્રદાન કરવા માટે કેવી અસર પાડે છે?

- ખૂબ જ સકારાત્મક અસર કોઈ અસર નથી નકારાત્મક અસર

2. શું તમે માનો છો કે સુધારેલા માતૃત્વ પોશાક દર્દીઓની તૃપ્તિ અને હોસ્પિટલ ફરીથી પ્રવેશ ઘટાડવામાં મદદ કરી શકે છે?

- પૂરેપૂરું સહમત થોડુંક સહમત બિલકુલ અસહમત

3. જન્મ પછીના કયા તબીબી સ્થિતિઓ માટે માતૃત્વ પોશાક ડિઝાઇનમાં ખાસ ધ્યાન રાખવું જોઈએ? (બધા યોગ્ય વિકલ્પો પસંદ કરો)

- સીઝેરિયન પુનઃપ્રાપ્તિ સ્તનપાન સહાય ગતિશીલતા સંબંધી સમસ્યાઓ ઘાવની સંભાળ યોનિ દ્વારા પ્રસૂતિની પુનઃપ્રાપ્તિ અન્ય: _____

4. ડિઝાઇન માટે કયા બજેટ મર્યાદાઓનો વિચાર કરવો જોઈએ?

- 200₹ - 300₹ 300₹ - 400₹ 400₹ - 500₹ 500₹થી વધુ અન્ય: _____

5. માતૃત્વ પોશાકની ડિઝાઇનમાં ચેપ નિયંત્રણ કેટલું મહત્વપૂર્ણ છે?

- ખૂબ જ મહત્વપૂર્ણ થોડું મહત્વપૂર્ણ બિલકુલ મહત્વપૂર્ણ નથી

6. માતૃત્વ પોશાક માટે આદર્શ જીવનકાળ શું છે?

- 1-3 મહિના 3-6 મહિના 6-12 મહિના 12 મહિનાથી વધુ

6. શું તમે માનશો કે માતૃત્વ પોશાકની ડિઝાઇનમાં ટકાઉ સામગ્રી મહત્વપૂર્ણ છે?

- હા ના નક્કી નથી

વિભાગ 6: હોસ્પિટલમાં માતૃત્વ પોશાકની નીચેની વિશેષતાઓ માટે તમારી પસંદગીઓ શું છે?

<p>આકૃતિ (પોશાકના સંપૂર્ણ આકાર):</p> <p><input type="checkbox"/> ઢીલા અને વહેતા</p> <p><input type="checkbox"/> શારીરિક આકૃતિને અનુરૂપ પરંતુ આરામદાયક</p> <p><input type="checkbox"/> A-લાઇન (કમરથી ફેલાતું)</p> <p><input type="checkbox"/> એમ્પાયર વેસ્ટ (ઉચ્ચ કમરનો રેખાંકન છાતીના તળિયે)</p> <p><input type="checkbox"/> અન્ય (ફૂપા કરીને ઉલ્લેખ કરો): _____</p>	<p>બાંધનો અંદાજ:</p> <p><input type="checkbox"/> વિના બાંધનો</p> <p><input type="checkbox"/> ટૂંકા બાંધ</p> <p><input type="checkbox"/> લાંબા બાંધ</p> <p><input type="checkbox"/> 3/4 બાંધ</p> <p><input type="checkbox"/> કપડાંવાળી અથવા એડજસ્ટેબલ બાંધ</p> <p><input type="checkbox"/> અન્ય (ફૂપા કરીને ઉલ્લેખ કરો): _____</p>
<p>ગળાનો અંદાજ:</p> <p><input type="checkbox"/> ગોળ ગળા</p> <p><input type="checkbox"/> V-નેક</p> <p><input type="checkbox"/> ચોરસ ગળા</p> <p><input type="checkbox"/> ઊંચો ગળા</p> <p><input type="checkbox"/> કીહોલ ગળા</p> <p><input type="checkbox"/> અન્ય (ફૂપા કરીને ઉલ્લેખ કરો): _____</p>	<p>રંગની પસંદગી:</p> <p><input type="checkbox"/> હળવા અને ન્યુટ્રલ રંગો (જેમ કે સફેદ, બેઝ, પેસ્ટલ)</p> <p><input type="checkbox"/> તેજસ્વી અને બોલ્ડ રંગો (જેમ કે લાલ, નીલો, લીલો)</p> <p><input type="checkbox"/> નરમ અને શાંત ટોન (જેમ કે હળવા ગુલાબી, લાવંડર, મિન્ટ)</p> <p><input type="checkbox"/> ગાઢ ટોન (જેમ કે કાળો, નેવી, ચારકોલ)</p>

પોશાકની લાંબાઈ: <input type="checkbox"/> ઘૂંટણ સુધી <input type="checkbox"/> મધ્યમ કાલ્ફ લાંબાઈ <input type="checkbox"/> સંપૂર્ણ લાંબાઈ <input type="checkbox"/> ઘૂંટણની ઉપર <input type="checkbox"/> અન્ય (ફૂપા કરીને ઉલ્લેખ કરો): _____	પેટર્નની પસંદગી: <input type="checkbox"/> સોલિડ રંગો <input type="checkbox"/> સ્ટ્રિપ્સ <input type="checkbox"/> ફૂલના ડિઝાઇન <input type="checkbox"/> ભૂમિતિના પેટર્ન <input type="checkbox"/> પોલકાડોટ્સ ડોટ્સ <input type="checkbox"/> અન્ય (ફૂપા કરીને ઉલ્લેખ કરો): _____
---	--

વિભાગ 7: ખુલ્લા પ્રશ્નો

1. તમારાં દર્દીઓ માટે માતૃત્વ પોશાકમાં તમે કયા લક્ષણો જોવા માંગો છો?
2. શું કોઈ હાજર ડિઝાઇન અથવા પ્રોડક્ટ્સ છે જેની તમે ભલામણ કરો છો?
3. શું તમારા હોસ્પિટલમાં માતૃત્વ પોશાક માટે કોઈ રંગ સંહિતા છે?
4. ડિઝાઇન માટે કયા બજેટ મર્યાદાઓ ધ્યાનમાં લેવી જોઈએ?

"ભાગ લેવા બદલ આભાર!"

Appendix 5

Evaluation Form

Researcher: Ms. Dhruvika Patel, Sr. M.Sc. (F.C. Sc)

Department/Faculty: Clothing and Textiles, Family and Community Sciences

University: The Maharaja Sayajirao University of Baroda, Vadodara

Guide: Dr. Reena Bhatia

This evaluation form is part of my research study titled 'Design Solutions for Maternity Wear in Public Healthcare Hospitals,' guided by Dr. Reena Bhatia. Your valuable feedback will contribute to fulfilling one of my research objectives.

Objective: To test the usability and acceptability of the designed maternity wear.

Thank you for your time and valuable input. Your responses will help improve maternity wear designs in public healthcare settings.

Participant Details

Name:

Delivery Type: (Tick One) Normal Delivery C-section

Is this your First Delivery? (Tick One) Yes No

Hospital/Location: (Tick One) SSG GMERS

Garment Evaluation

Each participant will wear two garments from one category (either Top-Bottom or One-Piece). Please evaluate each garment based on the given criteria and rate them on a scale of 1 to 5 (1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent). Additional comments are encouraged for detailed feedback.

Garment 1

Category (Tick One): Top-Bottom One-Piece

Garment Code (Tick One):

- A - Teardrop opening at the front covered by a yoke (One-piece)
- B - Diagonal front opening on both sides, secured with buttons (One-piece)
- C - Hidden horizontal welt opening under a coat-like flap (One-piece)
- D - Teardrop opening at the front covered by a yoke (Top-Bottom)
- E - Diagonal front opening on both sides, secured with buttons (Top-Bottom)
- F - Hidden horizontal welt opening under a coat-like flap (Top-Bottom)

Evaluation Criteria:

Criteria	Rating (1-5)
Fabric Softness	
Skin Irritation	
Breathability	
Absorbency	
Stretch & Flexibility	
Ease of Wearing & Removing	
Dignity & Respect	
Breastfeeding Accessibility	
Odor Resistance	
Design Aesthetics	
Sustainability	
Overall Satisfaction	

Additional Comments: _____

Garment 2

Category (Tick One): Top-Bottom One-Piece

Garment Code (Tick One):

- A - Teardrop opening at the front covered by a yoke (One-piece)
- B - Diagonal front opening on both sides, secured with buttons (One-piece)
- C - Hidden horizontal welt opening under a coat-like flap (One-piece)
- D - Teardrop opening at the front covered by a yoke (Top-Bottom)
- E - Diagonal front opening on both sides, secured with buttons (Top-Bottom)
- F - Hidden horizontal welt opening under a coat-like flap (Top-Bottom)

Evaluation Criteria:

Criteria	Rating (1-5)
Fabric Softness	
Skin Irritation	
Breathability	
Absorbency	
Stretch & Flexibility	
Ease of Wearing & Removing	
Dignity & Respect	
Breastfeeding Accessibility	
Odor Resistance	
Design Aesthetics	
Sustainability	
Overall Satisfaction	

Additional Comments: _____

Garment 3

Category (Tick One): Top-Bottom One-Piece

Garment Code (Tick One):

- A - Teardrop opening at the front covered by a yoke (One-piece)
- B - Diagonal front opening on both sides, secured with buttons (One-piece)
- C - Hidden horizontal welt opening under a coat-like flap (One-piece)
- D - Teardrop opening at the front covered by a yoke (Top-Bottom)
- E - Diagonal front opening on both sides, secured with buttons (Top-Bottom)
- F - Hidden horizontal welt opening under a coat-like flap (Top-Bottom)

Evaluation Criteria:

Criteria	Rating (1-5)
Fabric Softness	
Skin Irritation	
Breathability	
Absorbency	
Stretch & Flexibility	
Ease of Wearing & Removing	
Dignity & Respect	
Breastfeeding Accessibility	
Odor Resistance	
Design Aesthetics	
Sustainability	
Overall Satisfaction	

Additional Comments: _____

Preference Ranking

Rank the three garments you have experienced from most preferred to least preferred.

1 = Most Preferred

2 = Moderate Preference

3 = Least Preferred

Rank:

1. _____
2. _____
3. _____

Bottom Preference

Which type of bottom do you prefer the most and why? (Tick One)

- Drawstring Waist (Cord Waistband)
- Fully Elasticated Waistband
- Partially Elasticated Waistband (Front Plain, Back Elasticated)
- Other: _____

Reason for preference:

Suggestions for Improvement:

Thank you for your participation!

Google form link: https://docs.google.com/forms/d/e/1FAIpQLSeBWvcAO6-VcIKvU4mBstAyj-TYw0VqV-DG_ymJ5MbjEKlgNA/viewform?usp=sharing

Annexure I (A)- IHEC Application form for Academic Project of faculty/PG/UG students.

For Office Use	
Received Date:	
IHEC No:	
Returned after IHEC evaluation:	
Received after revision:	
IHEC Approval Date:	



Proposal Title:

Design solution for maternity wear in public healthcare hospital

Investigators details:

	Name, Qualifications & Designation	Address, Mobile & Email ID	Signature
Faculty/Student	Dhruvika Ashokbhai Patel BSc Clothing & Textiles MSc Clothing & Textiles	Motiwada, Udwada(R.S) Ta. Pardi, Dist. Valsad, Gujrat. Mobile No: +91 9327054017 Email ID: dhruvikapatel404@gmail.com	
Co-Guide	Dr. Neha Makvana M. S. O.B-04 Assistant Professor	GMERS medical college, gotri 9978576220. neha22mekhara@gmail.com	

Minimal Risk

Yes / No

Checklist for attached documents:

- | | |
|---|---|
| 1. IHEC Application form | Yes <input checked="" type="checkbox"/> |
| 2. Curriculum Vitae Principal Investigator | Yes <input type="checkbox"/> |
| 3. GCP Certificate | Yes <input type="checkbox"/> / No <input type="checkbox"/> / NA <input type="checkbox"/> |
| 4. Approval of departmental scientific committee/Institutional scientific board | Yes <input checked="" type="checkbox"/> |
| 5. Proposal (Introduction, Review & Justification, Objectives, Methodology, Outcome measures, Plan for data analysis) | Yes <input checked="" type="checkbox"/> |
| 6. Case Record Form and / or questionnaires | Yes <input checked="" type="checkbox"/> |
| 7. Patient information sheet (Dardi Mahiti Patrak) in English | Yes <input type="checkbox"/> / No <input type="checkbox"/> / NA <input type="checkbox"/> |
| 8. Patient information sheet (Dardi Mahiti Patrak) in vernacular language | Yes <input type="checkbox"/> / No <input type="checkbox"/> / NA <input type="checkbox"/> |
| 9. Informed Consent form (Dardi Sahmati Patrak) in English | Yes <input checked="" type="checkbox"/> / No <input type="checkbox"/> / NA <input type="checkbox"/> |
| 10. Informed Consent form (Dardi Sahmati Patrak) in vernacular languages | Yes <input checked="" type="checkbox"/> / No <input type="checkbox"/> / NA <input type="checkbox"/> |

Date: 21-11-2024

Name & Signature of Faculty/Student
 Dhruvika Ashokbhai Patel

Name & Signature of Co-I/Guide

Dr. Neha Bhatia

Institutional Human Ethics Committee

Annexure 2

CDSO Registration No. ECR/28/Inst/GJ/2013/RR-24 Approved upto 15 / April / 2029
NECRBHR Registration No. ECINEWIINST/2021/GJ/0016 Approved upto 15 / November / 2026
GMERS Medical College & Hospital, Gotri, Vadodara – 390021, Gujarat, India
Phone: (0265) 2398008, Fax: (0265) 2398009, Email: ihecmcgv@gmail.com

OUTWARD NO: IHEC/24/OUT/SRMSU01
IHEC, GMERS MEDICAL COLLEGE
& HOSPITAL, GOTRI, VADODARA.

RECEIVED DATE: 20/11/2024
OUTWARD NO: IHEC/24/OUT/SRMSU01
APPROVAL DATE: 29/11/2024

To,

Student: Ms. Dhruvika Patel, BSc, MSc Clothing & Textiles, Maharaja Sayajirao University

Guide: Dr. Neha Makwana, Assistant Professor - OB-GYN, GMERS MCGV

Co-I/Guide: Reena Bhatia, Assistant Professor, Family and Community Sci. MSU

Sub: Approval of your research proposal

Dear Ms. Dhruvika Patel,

The Institutional Human Ethics Committee reviewed and discussed your application to conduct the research proposal entitled: **“Design solution for maternity wear in public healthcare Hospital.”** on 29th Nov, 2024.

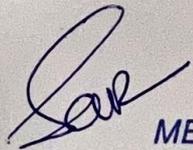
The following documents were reviewed

1. IHEC filled up a research proposal form.
2. Investigation's Undertaking
3. Departmental Scientific Meeting report.
4. Curriculum Vitae Principal Investigator
5. Proposal of departmental scientific committee/institutional s
6. scientific board Outcome measures, Plan for data analysis
7. Questionnaire/CRF.
8. Patient Information Sheet and Informed consent form.(English, Gujarati)
9. Informed Consent form (Dardi Sahmati Patrak) in Vernacular languages
10. Informed Consent form (Dardi Sahmati Patrak) in English

As the research study classifies in the minimal risk category, the IHEC GMERS approves your study to be conducted in the presented form.

The approval remains valid for a period of 1 year. In case the study is not initiated within one year, The Ethics Committee expects to be informed about the reason for the same and a fresh approval will have to be obtained subsequently.

The IHEC expects to be informed about the progress of the study (every 6 months), any Serious Adverse Event (SAE) occurring in the course of the study, and if any changes are made in the protocol or patient information/informed consent The IHEC needs to be informed about this in advance and an additional permission is required to be taken. The IHEC also requires you to submit a copy of the final study report.



MEMBER SECRETARY

IHEC

Signature

Member Secretary, GMERS Medical College

IHEC

& Hospital
Gotri, Vadodara

Annexure 3



Accredited Grade "A+" by NAAC

Department of Clothing and Textiles
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda
Fatehgunj Road, Vadodara-390002
Ph: (+91-0265)2795522

PERMISSION LETTER

Date: 09/12/2024

To,

Dr. Rajiv. N. Deveshwar
Medical Superintendent
S.S. Hospital, Jail Road
Anandpur, Vadodara
Gujarat - 390001

Subject: seeking for Permission to collect user data for academic research

Dear Sir/ Madam,

I am writing to request permission for my master student, Dhruvika Patel, to collect data from this renowned government Hospital for her research dissertation titled "Design Solutions for Maternity Wear in Public Healthcare Hospitals."

As her guide, I oversee her research and ensure its adherence to ethical standards. The study aims to:

To investigate and develop evidence-based design solutions for maternity wear in public healthcare hospitals, enhancing patient-centered care and healthcare provider efficiency.

The research methodology involves:

1. Semi-structured interviews with healthcare providers and administrators
2. Questionnaires administered to postpartum mothers.
3. Observational studies of maternity wear usage and healthcare provider-patient interactions

Dhruvika will:

1. Coordinate with hospital staff for interviews and data collection
2. Obtain informed consent from participants
3. Maintain confidentiality and anonymity of all data collected
4. 6-week wear trial period with participating postpartum women.

Wear Trial Period Details:

Duration: 6 weeks

Participants: 10 postpartum women

Objective: Assess comfort, functionality, and patient satisfaction with specially designed maternity wear shorts

Antepartal / Postnatal

ANC
OPD-10

want
Postnatal
yes

24/12

10/12/24

Department of
Obs & Gynae

The expected outcomes of this study include:

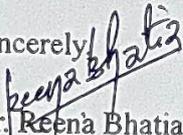
1. Informing the development of effective and patient-centered maternity wear design solutions.
2. Enhancing patient satisfaction and healthcare experience.
3. Improving healthcare provider efficiency and resource allocation.

Time Duration: September 2024 to April 2025

I assure minimal disruption to hospital operations and adhere to all applicable ethics guidelines. Please consider granting permission for this research, optimal which area will contribute to improving patient care and healthcare services.

Looking forward to your permission. Consideration of the request will deeply appreciate your support in advancing healthcare research and improving patient care and supporting the cause of education

Sincerely,

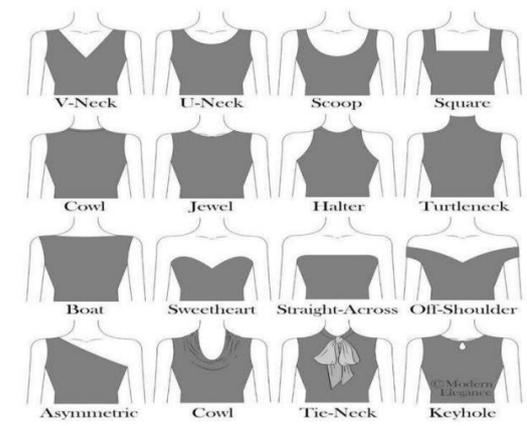


Dr. Reena Bhatia
I/C Head & Guide
Department of Clothing and Textiles,
Faculty of Family and Community Sciences,
The Maharaja Sayajirao University of
Baroda, Vadodara

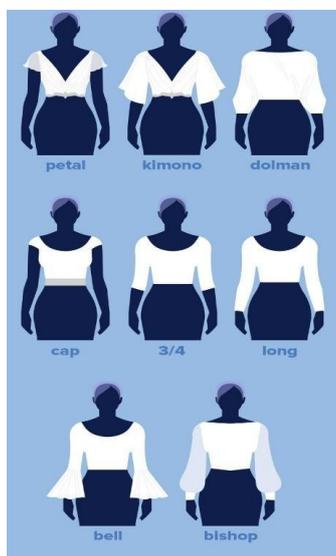
Annexure for Questionnaire



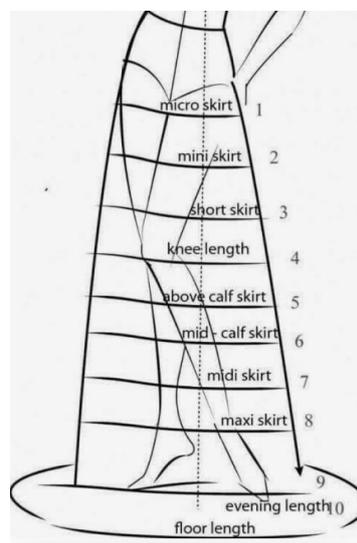
Types of Silhouettes



Types of Necklines



Types of Sleeves



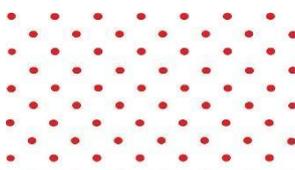
Types of Length

Pattern

Floral



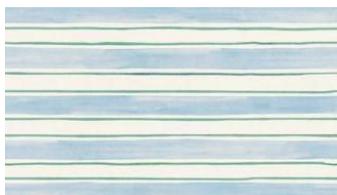
Polka dots



Geometric



Stripes



Abstract



Solid colors



Patterns

□ Small repeats placement



□ Large repeats



□ Random

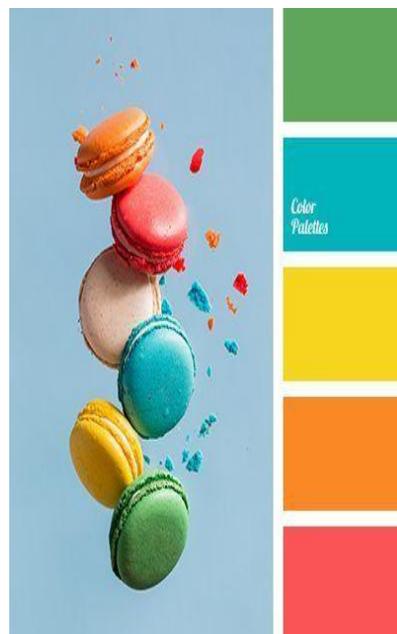


Colours

Pastel



Bright and bold



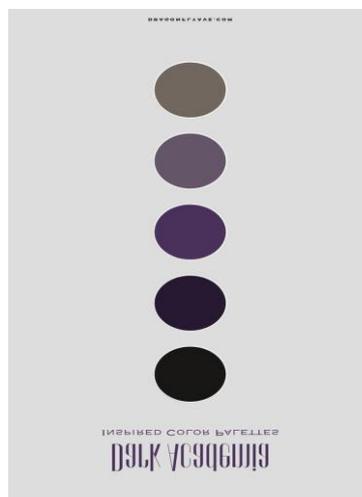
Neutral



Earthy tones



Dark colours



Annexure-5

Experimental study for Effective blood stain removal techniques for hospital linen



EFFECTIVE BLOOD STAIN REMOVAL TECHNIQUES FOR HOSPITAL LINEN
SPECIAL PROBLEM IN CLOTHING AND TEXTILES - CTX2415E04

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EFFECTIVE BLOOD STAIN REMOVAL TECHNIQUES FOR HOSPITAL LINEN
SPECIAL PROBLEM IN CLOTHING AND TEXTILES

1. Introduction

Blood stains on hospital linen pose significant challenges due to their infectious nature and potential for cross-contamination. Effective removal is crucial for infection control and patient safety. This study explores various chemical and physical methods to remove blood stains from hospital linen, comparing their effectiveness and safety. The research aims to identify the most efficient and safe technique for blood stain removal in hospital settings, ensuring infection control and patient safety. The study involves testing various chemical and physical methods on different types of hospital linen, including cotton, polyester, and poly-cotton blends. The results will be used to develop a protocol for blood stain removal in hospital settings.

1.1 Research Problem:

Despite the availability of various blood stain removal techniques, hospital linen often remains stained, posing a risk of infection. The current hospital cleaning process, which often involves bleaching and high-temperature washing, may not be as effective or safe as newer approaches. This study aims to evaluate the effectiveness of different blood stain removal techniques, including enzymatic, alkaline, and physical methods, and to identify the most effective and safe technique for blood stain removal in hospital settings.

Note: While testing, it is important to use appropriate safety measures, such as wearing gloves and eye protection, to avoid injury. The study will be conducted in a controlled environment, and the results will be used to develop a protocol for blood stain removal in hospital settings.

Setting. Additionally, the impact of different blood groups on stain adherence and removal remains underexplored. Without optimized cleaning protocols tailored to fabric types, hospitals may experience increased fabric wear, higher replacement costs, and compromised hygiene standards.

This study aims to identify the most effective blood stain removal techniques while maintaining fabric properties. By evaluating chemical methods and testing innovative cleaning techniques on different hospital fabrics, the research seeks to propose improvements to current hospital cleaning practices. The findings will help hospitals adopt fabric-specific cleaning strategies that enhance hygiene, efficiency, and cost-effectiveness.

1.2 Objectives

1.2.1 To evaluate existing blood stain removal techniques used in hospitals.
1.2.2 To experiment with different stain removal techniques on common hospital fabrics.
1.2.3 To assess how different fabric types affect blood stain and their ease of cleaning.
1.2.4 To propose improvements to current blood stain removal practices in hospitals to optimize cleaning efficiency and fabric longevity.

2. Review of Literature:

2.1. Blood Composition & Its Effect on Stain Removal

Blood is primarily composed of various biological molecules that affect its staining properties and the ease of removal.

- Protein (Fibrinogen, Albumin, Fibrinogen) Protein coagulates when exposed to air, making stain removal more challenging. Coagulation binds the stain tightly to fabric fibers, requiring enzymatic treatments for effective removal.
- Iron (from Hemoglobin) Reacts with oxygen, leading to oxidation and setting stains over time. Oxidized stains often require reducing agents or enzymatic cleaners for effective removal.
- Lipids & Fat: Allow stain penetration and require surfactants for effective removal, as lipid-based stains resist water-based cleaning solutions.
- Blood pH & Enzyme Activity: Blood has a slightly alkaline pH (~7.3), which can react with different stain removal solutions. Alkaline detergents can help break down protein structures in certain stain types [1].

1.2. How Different Blood Groups Affect Stain Removal

Recent studies suggest that blood groups might influence stain adherence due to varying protein and antigen compositions.

Blood group	Antigen(s) present on the red blood cells	Antibodies present in the serum	Genotype(s)
A	A antigen	Anti-B	AA or AO
B	B antigen	Anti-A	BB or BO
AB	A antigen and B antigen	None	AB
O	None	Anti-A and Anti-B	OO

1.3. Fresh vs. Dried Blood Stains

- Fresh Blood Stains:** Easier to remove because proteins haven't fully coagulated. Effective removal techniques include:
 - Cold water rinse to prevent coagulation.
 - Enzymes (available in stain removers) to break down proteins.
- Dried Blood Stains:** More challenging due to protein and protein denaturation. Effective removal techniques include:

1. Enzymatic cleaners (protease-based detergents to break down protein bonds [5])

- Neutral pH enzymatic cleaners are best for stain removal.

2.4 Factors That Influence Stain Removal Efficiency

- Temperature:** Warmer water causes protein to coagulate, setting stains permanently. Cold water is preferred for initial stain removal.
- pH Levels:** Alkaline detergents (pH above 7) break down protein-based stains effectively, while acidic solutions may set protein stains.
- Enzymatic Cleaners:** Protease enzymes work best on dried blood stains by dissolving protein structures.
- Mechanical Action:** Scrubbing and using tools like toothbrushes help penetrate deep into fabric fibers, improving stain removal efficiency.

3. Methodology

This study investigates the effectiveness of various blood stain removal techniques through a combination of hospital surveys and experimental testing on different fabric types. The research is divided into three key phases: assessing current hospital stain removal practices, experimentally testing stain removal techniques, and developing recommendations for improved cleaning protocols.

3.1 Hospital Survey on Blood Stain Removal Techniques

- Objective:** To assess current stain removal practices used in hospitals.
- Target Participants:** Hospital linens staff, housekeeping personnel.
- Data Collection:** Conduct interviews.
- Survey Focus Areas:**
 - Common stain removal products and techniques used.
 - Washing procedures.

3.2 Experimental Testing of Stain Removal Techniques and How Different Fabric React to Blood

- Objective:** To compare the effectiveness of various stain removal techniques on different fabrics.

3.2.1 Fabric and Stain Selection

Four fabric types (cotton, polyester, poly-cotton blend, and flannel) were selected based on their prevalence in hospital use. Artificial blood was prepared using protein-based substances, dye, and viscosity modifiers to simulate real blood properties.

This study focuses on three fabric types commonly used in hospital settings:

- Cotton: Highly absorbent but prone to deep stains.
- Polyester: Synthetic fiber that is less absorbent, making it potentially easier to clean.
- Poly-cotton Blend: A combination of natural and synthetic fibers that balances absorbency and durability.

Realistic stains were prepared by simulating scenarios like a spill on a patient's gown or a spill on a hospital bedsheet. The fabric was chosen due to its ability to absorb liquid, its availability, and its relatively easy maintenance requirements.

3.2.2 Staining and Treatment Process

Fabric samples were prepared by uniformly staining with artificial blood collected from a pathology laboratory for consistent purposes. Stains were allowed to set under controlled conditions before testing removal techniques to ensure consistent results.

The blood was applied to the prepared fabric samples and left to set for a specified duration, ensuring uniform stain penetration for accurate evaluation of stain removal effectiveness.

3.2.3 Materials

The present study utilized a range of materials to investigate the effectiveness of various stain removal techniques on different fabric types. The materials used included:

- Fabric Samples**

A total of 20 fabric samples were used in the study. The samples were cut into 2x2 inch blocks and consisted of five different fabric types:

- Black cotton fabric (5 samples)
- Cotton blend (5 samples)
- Polyester fabric (5 samples)
- Poly-cotton blend fabric (5 samples)

2. Blood Sample

- Source: Real human blood was obtained from a pathology practitioner.
- Total Blood Used: 10 ml per set.
- Application Volume: 5ml per 2x2 inch fabric sample.
- Storage Condition: If not used immediately, blood was stored at 4°C in an anticoagulant (heparin) tube and brought to room temperature before application.

3. Stain Removal Solutions

A range of stain removal solutions were tested on the fabric samples, including:

- Apply Salt & Baking Soda Paste:** Mix 1:2 (proportion of salt and 1:2 proportion of baking soda) in five drops of water in a glass jar. Rub into the stain, let sit for 10-15 minutes.
- Apply Hydrogen Peroxide (3%):** Add 1/2 tsp. hydrogen peroxide to the stain, let sit for 10-15 minutes, and blot with a clean cloth.
- Enzymatic Cleaner:** Mix enzymatic cleaner with water to form a paste. Apply onto blood stain and let sit for 15-30 minutes. Gently rub with a soft brush. Wash the stain with cold water.
- Cold Water Washing:** Wash the fabric with cold water (20°C-25°C), gently agitating for 1-2 minutes to remove any remaining blood.

1) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

2) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

3) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

4) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

5) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

6) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

7) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

8) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

9) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

10) Soak in warm, soapy water (Mild solution): Use warm water, add 1/2 liter of warm water, and use 1/2 liter of warm water with 1/2 liter of warm water.

3.2.3 Data Collection & Analysis

1) Pre- and Post-Treatment Imaging: Digital photography was used to visually compare stains before and after treatment at two weeks.

2) Stain Intensity Measurements: A color intensity scale (0-5) was used to evaluate the effectiveness of stain removal.

Rating	Description	Stain Intensity Measurement
0	No Stain	No visible stain remaining on the fabric.
1	Very Light Stain	Slightly noticeable but easily removed with basic cleaning.
2	Light Stain	Noticeable but still easily removed with standard cleaning.
3	Moderate Stain	Requires more aggressive cleaning methods to remove.
4	Heavy Stain	Significant stain residue, requires repeated cleaning.
5	Very Heavy Stain	Stain is still prominent and difficult to remove.

3.3.3 Development of Recommendations

The final phase of the study focused on synthesizing recommendations to enhance hospital cleaning efficiency while preserving fabric quality. This was achieved by:

- Reviewing Findings from Hospital Survey (Phase 1)
- Analyzing Experimental Testing Results (Phase 2)
- Formulating Recommendations for Improved Hospital Practices.

4. Results and Discussion

4.1 Evaluation of Various Blood Stain Removal Techniques in Hospitals

- The findings of this study are highly relevant to hospital settings, where blood stains are a common occurrence. Across all hospitals, industry practices for blood stain removal were found to be inconsistent, often relying on traditional methods like hot water and bleach. This study's findings suggest that more targeted, fabric-specific cleaning strategies are needed to improve hygiene and fabric longevity. The research highlights the importance of using enzymatic cleaners and cold water for fresh stains, while alkaline detergents and mechanical action are more effective for dried stains. The study also emphasizes the need for standardized cleaning protocols across different fabric types to ensure consistent results and reduce the risk of infection.

4.2 Experimentation with Different Stain Removal Techniques on Common Fabrics

- Can any commercially available stain remover be used to remove blood stains from common fabrics? The results indicate that the stain remover is not effective on all fabrics. It is most effective on cotton and polyester fabrics.
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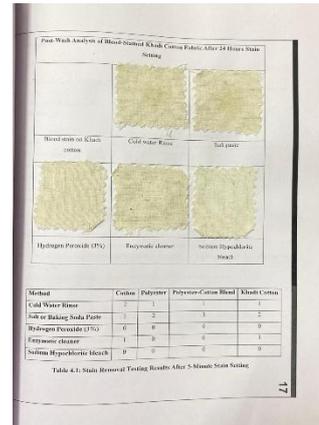
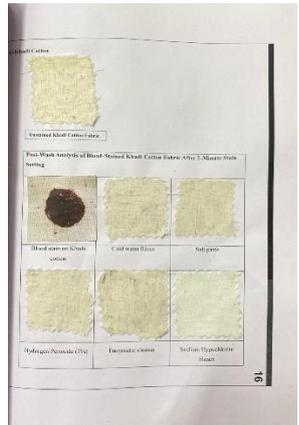
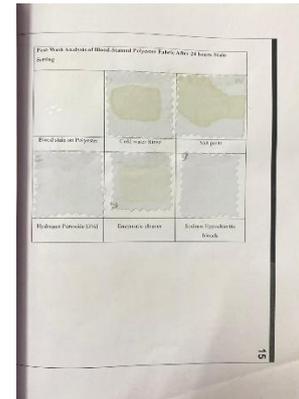
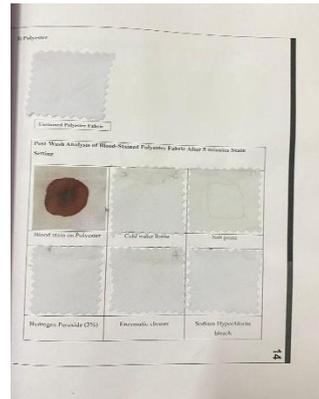
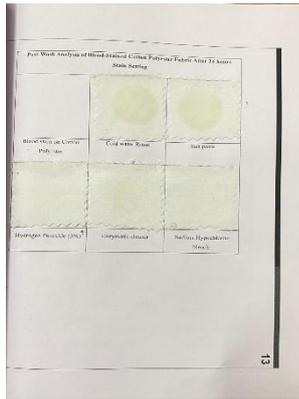
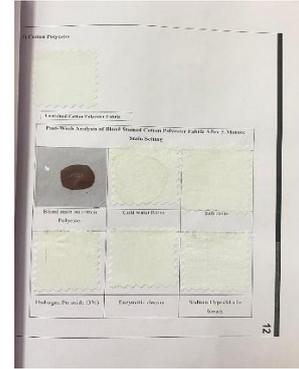
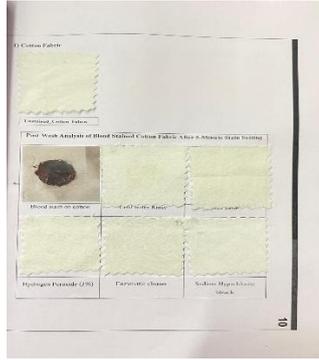


Table 4.1: Stain Removal Testing Results After 5 Minute Stain Setting

Method	Cotton	Polyester	Polyester-Cotton Blend	Khadi Cotton
Cold Water Rinse	1	1	1	1
Salt or Baking Soda Paste	1	2	1	2
Hydrogen Peroxide (3%)	0	0	0	0
Enzymatic cleaner	1	0	0	1
Sodium Hypochlorite bleach	0	0	0	0

Observation:

- Hydrogen peroxide (3%) was most effective on cotton and polyester fabrics.
- Enzymatic cleaner was most effective on cotton and polyester fabrics.
- Sodium hypochlorite bleach was most effective on cotton and polyester fabrics.
- Cold water rinse was most effective on cotton and polyester fabrics.
- Salt or baking soda paste was most effective on cotton and polyester fabrics.

4.3 Assessment of Fabric Reaction to Blood Stains and Ease of Cleaning

The study examined how different fabrics absorbed and retained blood stains over time and how easy they were to clean. The results indicate that cotton and polyester fabrics are the easiest to clean, while khadi cotton is the most difficult.

Table 4.2: Fabric Reaction to Blood Stains After 5 Minutes and 24 Hours

Fabric Type	Blood Absorption After 5 Minutes	Blood Retention After 24 Hours	Ease of Cleaning (1-5)
Cotton	High	Medium	High
Polyester	Low	Low	Medium
Polyester-Cotton Blend	Medium	Medium	High
Khadi Cotton	High	High	Low

4.3 Results of Proposed Improvements for Khadi Stain Removal Processes

- Use of hydrogen peroxide (3%) and enzymatic cleaner for khadi stain removal.
- Use of sodium hypochlorite bleach for khadi stain removal.
- Use of cold water rinse for khadi stain removal.
- Use of salt or baking soda paste for khadi stain removal.

Appendices

5. Conclusion

- After the blood donor medical history information was registered into the specific register, the donor's return to normal efficiency with ethics inquiries.
- The study for assessing the blood donor medical history information in the blood donor medical history register, with the data register design software for the register, donors or staff, physician donors after the highest medical assistance, because of the data register design software design for periodic review to monitor the progression patients. With the registration of blood donors, the register design software is highly effective, helps the accuracy, it is user accessible, flexible and portable.
- By implementing a computer program, it is possible to overcome the manual operation, keep the information more secure, reduce errors, and help in the management of the donor's information. It is possible to design the register to help in the donor's information, and the information in the blood donor register.

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6. Ethical Considerations

The research involved the collection and use of the research's own blood to study the general efficiency of the blood donor. Due to the design of the blood donor medical history register and blood donor, the research's own blood is used to study the general efficiency and return to normal efficiency of the blood donor.

- Voluntary Participation and Informed Consent:** Since the blood donor in this study was a self-volunteer, informed consent was obtained. The research's own blood is used to study the general efficiency of the blood donor.
- Privacy and Medical Information:** The research's own blood is used to study the general efficiency of the blood donor. The research's own blood is used to study the general efficiency of the blood donor.
- Ethical Considerations:** The research's own blood is used to study the general efficiency of the blood donor. The research's own blood is used to study the general efficiency of the blood donor.
- Researcher and Data Management:** The research's own blood is used to study the general efficiency of the blood donor. The research's own blood is used to study the general efficiency of the blood donor.

- All blood donor information was stored in a secure place and protected by a password.
- All research's own blood is used to study the general efficiency of the blood donor.
- All research's own blood is used to study the general efficiency of the blood donor.
- All research's own blood is used to study the general efficiency of the blood donor.

5. Compliance with Ethical and Legal Guidelines

All research's own blood is used to study the general efficiency of the blood donor. The research's own blood is used to study the general efficiency of the blood donor.

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8. Learning Experience

During my research, I initially worked with medical history register design software and blood donor history register. This allowed me to understand the general efficiency of blood donor history register, and the general process of blood donor history register.

However, in the process, I found out that the blood donor history register design software is not user-friendly, and it is not possible to design the blood donor history register design software. I found primary register design, and confidentially register design. This led me to design my own blood donor history register, which was a user-friendly and confidentially register design.

- This was a new and unique experience for me, and I found about the specific process of blood donor history register design, and the general process of blood donor history register design.
- With the help of my own blood donor history register design software, I found out that the blood donor history register design software is not user-friendly, and it is not possible to design the blood donor history register design software. I found primary register design, and confidentially register design. This led me to design my own blood donor history register, which was a user-friendly and confidentially register design.
- I was able to design my own blood donor history register design software, and I found out that the blood donor history register design software is not user-friendly, and it is not possible to design the blood donor history register design software. I found primary register design, and confidentially register design. This led me to design my own blood donor history register, which was a user-friendly and confidentially register design.

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Annexure-6

Image of the wear trial in GMERS hospital

	Day 1	Day 2	Day 3
			
Garment	A	B	C
			
Garment	B	C	A
			
	C	A	B

Appendices

Image of the wear trial in GMERS hospital

	Day 1	Day 2	Day 3
			
Garment	D	E	F
			
Garment	E	F	D
			
	F	D	E

Appendices

Image of the wear trial in SSG hospital

	Day 4	Day 5	Day 6
Image			
Garment	A	B	C
			
Garment	B	C	A
			
	C	A	B

Appendices

Image of the wear trial in SSG hospital

	Day 4	Day 5	Day 6
			
Garment	D	E	F
			
Garment	E	F	D
			
	F	D	E