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Postpartum Recovery Garments: A Systematic Scoping Review Integrating Ergonomics and User-Centered Design

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Abstract

With a focus on ergonomics and user-centered design, this study aims to systematically examine the literature on postpartum recovery clothing and related functional wear. A comprehensive scoping review of papers published between 2005 and 2025 was conducted using a number of databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, PubMed, Google Scholar, and CNKI. 53 studies were included using a methodical screening procedure. The findings were categorized into five major themes: user-centered design and wear experience; ergonomic considerations in the design of functional clothing; compression garments and support systems; changes in the body following childbirth and the need for recuperation; methodological limitations and evidence gaps. The results show that there is little integration between ergonomic analysis and user-centered assessment in the clinical, physiological, and design domains of current research. An integrated conceptual framework that links body shape, ergonomic requirements, compression and material selections, garment structure, and user feedback in a self-replicating design process is proposed to close this gap. By providing direction for future interdisciplinary research and practice, this study contributes to the development of a more systematic and evidence-based framework for postpartum recovery clothing design.

Keywords

postpartum recovery garments, ergonomics, user-centered design, compression garments, functional apparel

1. Introduction

The postpartum period is characterized by substantial physiological and morphological changes in women. Following childbirth, women commonly experience abdominal muscle weakness, pelvic floor dysfunction, reduced trunk stability, and alterations in body shape, which may negatively affect physical function and daily activities [20, 36]. To address these challenges, postpartum recovery garments are widely used to provide external support and compression, aiming to stabilize the abdominal region and alleviate discomfort [16]. From a design perspective, such garments can be classified as functional apparel, where structural configuration, material properties, and ergonomic principles interact to influence both support performance

and wearing comfort [39]. With increasing attention to maternal health and functional apparel innovation, postpartum recovery garments have become an important interdisciplinary research topic.

Current research on postpartum recovery garments spans multiple disciplines. Clinical and rehabilitation studies primarily focus on recovery outcomes, including pain management, physical function, and pelvic floor rehabilitation [10]. A second body of research originates from compression garment studies, which examine the effects of external pressure on circulation, muscle oscillation, and recovery processes [5, 19]. A third research stream derives from functional apparel design, emphasizing garment fit, anthropometry, pressure distribution, and thermal comfort [3, 26]. Although these studies collectively contribute to the understanding of postpartum garments, knowledge across these domains remains fragmented.

Despite the increasing volume of research, several critical limitations persist. Existing studies are typically confined within disciplinary boundaries, with limited integration across clinical, physiological, and design perspectives. Relationships between body morphology and garment design parameters remain insufficiently defined, and key variables such as anthropometry and pressure distribution are rarely linked to recovery stages or user needs [35]. Furthermore, user experience is often underrepresented, as many studies prioritize physiological performance while overlooking usability and wear trials [30]. As a result, the current literature lacks an integrated framework connecting postpartum morphology, ergonomic requirements, compression design, and user-centered evaluation.

This review aims to address these gaps by systematically analyzing existing literature on postpartum recovery garments and related functional apparel. Specifically, the objectives are to identify major research themes and evidence gaps, to examine the application of ergonomic principles and user-centered design, and to propose an integrated conceptual framework for future design and evaluation.

2. Methods

2.1 Review Design

This study adopted a systematic scoping review approach to examine the literature on postpartum recovery garments and related functional apparel. A scoping review was considered appropriate due to the interdisciplinary nature of the topic, which spans postpartum health, compression garment research, ergonomics, and apparel design. Unlike traditional systematic reviews that primarily focus on evaluating intervention effectiveness, scoping reviews are designed to map the breadth, range, and characteristics of research within a given field and to identify key concepts, research themes, and knowledge gaps [2, 25].

The methodological framework of this study followed established guidelines for scoping reviews, including structured database searching, transparent study selection, and systematic data extraction and thematic synthesis. This approach enables a comprehensive understanding of how postpartum recovery garments have been investigated across different disciplines, while also facilitating the identification of emerging research trends and areas requiring further investigation [38].

2.2 Search Strategy

A comprehensive literature search was conducted across multiple academic databases to identify relevant studies. The databases included Scopus, Web of Science, ScienceDirect, SpringerLink, PubMed, Google Scholar, and China National Knowledge Infrastructure (CNKI). The search was limited to studies published between 2005 and 2025, a period during which research on functional apparel and compression garments has developed substantially.

To ensure systematic coverage, search terms were organized into three conceptual blocks: postpartum context, garment type, and design and evaluation dimensions. Keywords within each block were combined using the Boolean operator “OR”, while the three blocks were connected using “AND”. A typical search string followed the structure:

(postpartum OR postnatal OR maternity recovery) AND (compression garment OR recovery wear OR support garment OR shapewear) AND (ergonomics OR comfort OR pressure OR user-centered design).

In addition to database searching, manual screening of reference lists from selected articles was conducted to identify additional relevant studies. This combined strategy ensured comprehensive coverage of literature related to postpartum recovery garments and functional apparel design.

Table 1: Search strategy and keyword structure

Module	Concept Category	Keywords
Module 1	Postpartum context	postpartum; postnatal; maternity recovery
Module 2	Garment type	recovery wear; compression garment; support garment; shapewear
Module 3	Design and evaluation	ergonomics; comfort; pressure; user-centered design

Note: Keywords within each module were combined using "OR", and the three modules were combined using "AND".

2.3 Eligibility Criteria and Screening Process

To ensure the relevance and quality of the included studies, explicit inclusion and exclusion criteria were established (Table 2).

Table 2: Eligibility criteria for study selection

Category	Criteria
Inclusion criteria	(1) Studies related to postpartum recovery garments, compression garments, or functional apparel; (2) Studies addressing physiological support, garment design, ergonomics, or user experience; (3) Peer-reviewed journal articles or conference papers; (4) Publications in English or Chinese.
Exclusion criteria	(1) Studies focusing solely on medical rehabilitation without garment involvement; (2) Studies on general sportswear without compression or support functions; (3) Studies lacking clear methodological descriptions.

The study selection followed a multi-stage screening process, including title and abstract screening followed by full-text assessment. A total of 268 records were initially identified through database searching. After removing duplicates, 214 records remained for title and abstract screening. At this stage, 132 records were excluded due to lack of relevance. The remaining studies were subjected to full-text review, resulting in 53 studies that met the inclusion criteria and were included in the final analysis.

During the screening process, studies investigating the physiological effects of compression garments in sports or recovery contexts were included, even when conducted on athletic populations, as they provide transferable insights into compression mechanisms relevant to postpartum garment design. For example, Hill et al. [19] reported that compression garments may enhance venous return and reduce muscle oscillation, thereby improving recovery outcomes. Similarly, Born et al. [5] highlighted that the effectiveness of compression garments is influenced by pressure levels and garment construction.

In addition, studies examining pressure distribution or support effects during physical activities, such as walking or movement, were considered relevant. For instance, Ali et al. [1] demonstrated that graduated compression stockings can influence physiological responses and improve circulation during exercise.

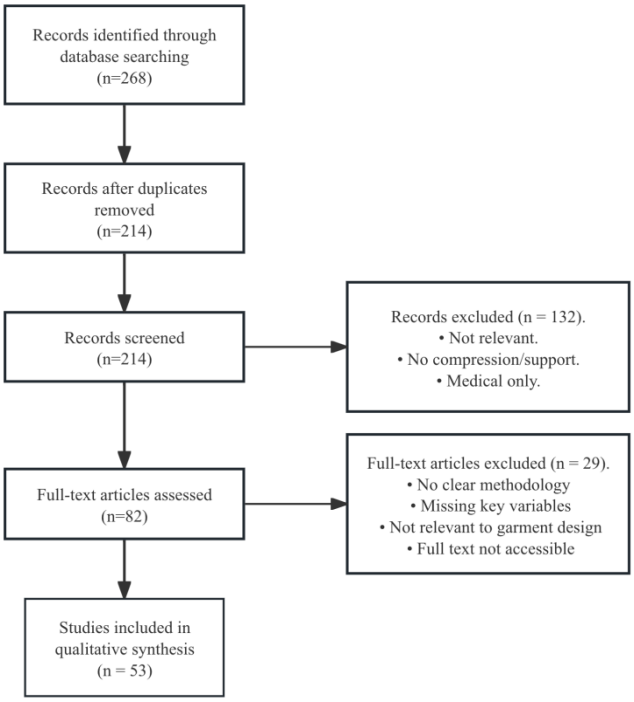
Studies focusing on orthopedic braces or medical support devices were excluded due to their distinct functional and structural characteristics. For example, Ludewig and Cook [27] investigated the effects of a shoulder brace on muscle activity; however, such devices differ fundamentally from garment-based compression systems and were therefore excluded.

The study selection process is illustrated in the PRISMA flow diagram (Figure 1).

2.4 Data Extraction and Thematic Synthesis

Following the study selection process, a structured data extraction and thematic synthesis approach was applied to all included studies. Each study was first coded based on its research focus and key outcomes, and subsequently categorized into broader thematic groups. This analytical process was informed by established methods of thematic synthesis commonly used in systematic and scoping reviews, which aim to organize heterogeneous findings into coherent conceptual themes [6, 37].

Figure 1: PRISMA flow diagram of study selection process, including identification, screening, eligibility assessment, and final inclusion of studies



Based on this process, the findings of the included studies were synthesized into five overarching themes: (1) postpartum morphological changes and recovery needs, (2) compression garments and support mechanisms, (3) ergonomic factors in functional apparel design, (4) user-centered design and wear experience, and (5) methodological limitations and evidence gaps. When a study addressed multiple aspects, it was included in more than one thematic category to enable cross-theme comparison and integrated analysis. These themes formed the analytical framework for the Results section.

Variables used solely for descriptive purposes, such as participant characteristics (e.g., age, height, or baseline physiological indicators), were not included in the thematic synthesis unless they were directly analyzed as outcome variables. For example, body composition or baseline physiological measures reported only to describe the sample were excluded from thematic analysis.

The data extraction process captured both general study characteristics and methodological details, including publication year, geographic context, participant group, sample size, garment type, and pressure-related features. In addition, information related to research objectives, outcome measures, ergonomic factors, user evaluations, and key findings was systematically recorded. Where necessary, data were standardized across studies to ensure comparability, particularly when different measurement units or reporting formats were used.

2.5 Data Synthesis

Given that the primary aim of a scoping review is to map the scope, structure, and characteristics of research within a field rather than to quantitatively evaluate intervention effects, no meta-analysis was conducted in this study [2, 25]. The heterogeneity of the included studies in terms of research objectives, methodologies, participant groups, and garment types further limited the feasibility of statistical synthesis.

Instead, a descriptive and narrative synthesis approach was adopted to summarize the characteristics and key findings of the included studies. The results were organized and presented through thematic analysis, as outlined in Section 2.4, to facilitate the identification of patterns, relationships, and variations across different research themes. Where appropriate, qualitative comparisons were conducted to highlight similarities and differences in research approaches, outcome measures, and findings.

3. Results

3.1 Search Results and Study Characteristics

A total of 53 studies were included following the systematic search and screening process. The selection procedure comprised database searching, duplicate removal, title and abstract screening, and full-text assessment, as illustrated in the PRISMA flow diagram (Figure 1). The included studies were published between 2005 and 2025, reflecting the rapid development of research on functional apparel and compression garments over the past two decades. Earlier studies primarily focused on clothing comfort and fundamental ergonomic principles, whereas more recent research has shifted toward compression mechanisms, postpartum recovery needs, and functional apparel design, indicating a transition from theory-driven to application-oriented research.

The characteristics of the included studies demonstrate a clear interdisciplinary nature. Most studies were conducted in Europe and North America, with a growing number of contributions from China and other East Asian regions in recent years. Methodologically, the studies encompass experimental, clinical, survey-based, and design-oriented approaches. Experimental and clinical studies predominantly evaluate physiological effects of compression garments, while design studies focus on structural optimization and ergonomic performance. The participant groups include postpartum women, athletes, and general users, and the garments investigated range from abdominal binders and compression stockings to shapewear and functional apparel prototypes. Overall, variations in research populations, methodological approaches, and evaluation criteria indicate that the field remains in a stage of interdisciplinary integration and methodological development.

3.2 Theme 1: Postpartum Morphological Changes and Recovery Needs

The first theme centers on the physiological and morphological alterations that occur in women following childbirth. Evidence indicates that postpartum women commonly experience abdominal muscle weakness, pelvic floor dysfunction, and reduced trunk stability, all of which negatively affect physical support and functional performance [10, 12, 36]. Restoration of abdominal muscle function is therefore considered a critical component of postpartum rehabilitation, as impaired muscle function may compromise postural control, core stability, and physical activity [21].

Diastasis recti abdominis is widely recognized as a key structural condition associated with pregnancy and childbirth. Research suggests that this condition may develop during pregnancy and persist into the postpartum period, thereby affecting abdominal integrity and functional capacity [4, 13, 20]. In addition, postpartum recovery is a dynamic and stage-dependent process characterized by varying physiological conditions and functional limitations. Early postpartum stages are typically associated with pain, fatigue, and reduced mobility, whereas later stages involve gradual improvements in muscle strength and functional capacity [17, 33].

These findings indicate that postpartum garment design should account for region-specific physiological changes and stage-dependent recovery needs, rather than relying on uniform compression strategies. Differentiated support across body regions may enhance both functional performance and wearing comfort [21].

3.3 Theme 2: Compression Garments and Support Mechanisms

Compression garments represent one of the most extensively investigated interventions in functional apparel research, with outcomes commonly related to blood circulation, muscle recovery, perceived support, and pain reduction [5, 19, 28]. By applying external pressure to the body, compression garments are proposed to enhance venous return, reduce muscle oscillation, and facilitate recovery processes.

Research on lower-body compression systems demonstrates that graduated compression stockings can improve circulation and influence physiological responses during physical activity [1, 31]. However, systematic reviews indicate that the effectiveness of compression garments remains inconsistent and is strongly influenced by pressure magnitude, garment fit, and material characteristics [15, 19]. These findings

suggest that compression performance is determined not by a single parameter, but by the interaction of multiple design variables.

Within the context of postpartum recovery, abdominal binders and support garments have been reported to enhance trunk stability and reduce postoperative discomfort. Clinical studies suggest that abdominal binders may alleviate pain following cesarean delivery and improve early mobility [11, 16]. Nevertheless, these studies primarily focus on short-term clinical outcomes and provide limited insight into how garment structure influences pressure distribution and functional support.

Overall, although the physiological effects of compression garments have been widely examined, the evidence remains fragmented and sometimes contradictory. Variations in pressure level, material elasticity, and garment construction contribute to these inconsistencies. Moreover, most studies emphasize physiological responses while overlooking the relationship between compression mechanisms and garment structural design. As a result, the translation of compression principles into systematic apparel design remains insufficiently developed.

3.4 Theme 3: Ergonomic Factors in Functional Apparel Design

The third theme focuses on ergonomic factors in functional apparel design, particularly the roles of anthropometry, garment fit, pressure distribution, movement compatibility, and thermal comfort. Existing studies indicate that ergonomic considerations are fundamental in determining both the functional effectiveness and wearing comfort of compression and support garments [8, 39].

Anthropometric data and body morphology form the basis of garment design. Variations in body shape significantly influence garment fit and pressure distribution, which in turn affect comfort and functional performance [3, 35]. In compression garments, improper fit may result in uneven pressure distribution, reducing effectiveness and potentially causing discomfort.

Pressure distribution represents a critical ergonomic parameter. Studies demonstrate that both the magnitude and distribution of pressure must be carefully controlled to achieve functional outcomes without compromising comfort [32]. Excessive or uneven pressure may restrict movement, reduce compliance, and negatively affect wearer experience.

In addition to static fit, movement compatibility plays a key role in garment performance. Functional apparel must accommodate dynamic body movements without causing restriction or displacement. Research suggests that garments designed solely based on static anthropometric data may fail to meet functional requirements during movement [24, 26]. This consideration is particularly relevant for postpartum users, whose movement patterns and physical capabilities may differ from those of the general population.

Thermal and moisture comfort are also important ergonomic considerations. Fabric properties such as breathability and moisture management significantly influence wearer comfort and acceptance [18, 26]. In compression garments, increased fabric tension may reduce ventilation and affect thermal regulation.

Overall, these findings indicate that ergonomic performance in functional apparel results from the interaction of multiple parameters rather than isolated variables. However, existing studies often examine these factors independently, leading to a lack of integrated design approaches that simultaneously address body morphology, pressure distribution, movement compatibility, and comfort. This gap underscores the need for systematic and multidimensional ergonomic design frameworks.

3.5 Theme 4: User-Centered Design and Wear Experience

The fourth theme focuses on the role of user-centered design (UCD) in the development and evaluation of functional apparel. UCD emphasizes the systematic integration of user needs, behaviors, and feedback throughout the design process, ensuring that products are both functionally effective and usable in real-world contexts [23, 30].

In functional apparel research, wear trials and user evaluations are commonly employed to assess usability and comfort. These evaluations typically incorporate both subjective and objective measures, including perceived comfort, ease of donning and doffing, and compatibility with daily activities [9, 29].

Subjective assessments are particularly important for garments intended for prolonged use, as perceived comfort and usability strongly influence user acceptance and compliance.

For postpartum women, usability factors are especially critical due to physical fatigue, discomfort, and body morphology changes following childbirth. Evidence suggests that garment usability, including ease of wear, adjustability, and adaptability to daily movement, significantly affects user satisfaction and continued use [17, 22]. Furthermore, discomfort associated with excessive tightness, movement restriction, or thermal burden may reduce adherence, even when garments provide measurable physiological benefits.

User feedback therefore represents a critical component of iterative design processes. Studies in apparel design demonstrate that incorporating user input during prototype development can improve fit, comfort, and functional performance [8, 39]. However, in many existing studies, user evaluation is treated as a secondary outcome rather than being systematically embedded within the design process. Consequently, the linkage between user experience and design decision-making remains underdeveloped.

3.6 Theme 5: Methodological Limitations and Evidence Gaps

The final theme synthesizes the methodological limitations and evidence gaps identified across the reviewed studies. A recurrent limitation is the relatively small sample size in many experimental and clinical investigations, which restricts the generalizability of findings and reduces statistical power [15, 19].

Another common limitation is the short duration of interventions. Most studies focus on immediate or short-term physiological responses, whereas evidence regarding long-term wear effects and sustained user outcomes remains limited [28]. This issue is particularly relevant for postpartum recovery garments, which are typically intended for prolonged daily use.

A further gap concerns the limited integration of three-dimensional body data in garment design and evaluation. Despite advances in body scanning technologies, many studies continue to rely on simplified anthropometric measures, which may not adequately capture complex body morphology or its relationship to garment fit and pressure distribution [8, 35].

In addition, substantial variability exists in pressure measurement methods across studies. Differences in measurement devices, protocols, and reporting practices hinder direct comparison of results and limit the establishment of standardized guidelines for compression garment design [32].

Moreover, subjective comfort assessments are often conducted independently from objective biomechanical measurements. While subjective evaluations provide critical insights into user experience, the lack of integration between subjective and objective data reduces the explanatory strength of findings [18, 26].

Finally, relatively few studies systematically examine garment performance across different body types. Given that body morphology strongly influences garment fit and pressure distribution, the lack of body-type-specific analysis represents a significant gap in the literature [3].

Taken together, these limitations indicate the need for more integrated research frameworks that combine ergonomic analysis, pressure measurement, and user-centered evaluation. Addressing these gaps provides a critical foundation for advancing both theoretical understanding and practical design, and directly informs the integrated framework proposed in the following Discussion section.

4. Discussion

4.1 Overall Synthesis of Findings

This review synthesizes evidence from 53 studies spanning postpartum recovery, compression garment research, ergonomic apparel design, and user-centered design. The existing literature can be broadly categorized into three primary research trajectories: postpartum physiological recovery, compression garment mechanisms, and functional apparel design.

The first trajectory is rooted in clinical and rehabilitation research, focusing on physiological changes following childbirth, including abdominal muscle weakness, pelvic floor dysfunction, and reduced trunk

stability [10, 36]. These studies consistently demonstrate diminished structural support and functional capacity in postpartum women, highlighting the need for external support interventions.

The second trajectory originates from sports science research on compression garments, examining the effects of external pressure on circulation, muscle recovery, and perceived support [5, 19]. While this body of work provides valuable insights into compression mechanisms, it is predominantly based on athletic populations. As such, its applicability to postpartum contexts remains indirect and insufficiently validated.

The third trajectory derives from functional apparel design and ergonomic research, emphasizing anthropometry, garment fit, pressure distribution, and thermal comfort [3, 39]. Although these studies offer important design principles, they often lack integration with clinical knowledge of postpartum physiology, thereby limiting their relevance to recovery-oriented garment design.

Despite the increasing volume of research, these trajectories remain largely disconnected. Clinical studies prioritize recovery outcomes, compression research focuses on physiological mechanisms, and apparel design studies emphasize structural and comfort-related factors. Consequently, the field lacks a coherent and integrative framework that systematically links postpartum body morphology, compression mechanisms, ergonomic design parameters, and user experience.

This fragmentation explains why existing studies, while effective in identifying isolated issues, have not yet established transferable and evidence-based design principles for postpartum recovery garments.

4.2 Why the Evidence Remains Fragmented

The fragmentation of evidence in this domain arises from the interplay of divergent research objectives, heterogeneous study populations, and inconsistent methodological frameworks. Clinical studies primarily focus on postpartum recovery outcomes, including functional restoration and symptom reduction [10], whereas compression garment research examines physiological responses such as circulation, muscle oscillation, and recovery processes [5, 19]. In contrast, apparel design studies emphasize garment fit, structural configuration, and comfort-related factors [3, 39]. These research streams operate within distinct conceptual frameworks, limiting the integration of findings across disciplines.

This fragmentation is further amplified by variations in study populations. Many compression garment studies are conducted on athletic or general populations rather than postpartum women, thereby reducing the direct applicability of findings to postpartum contexts [19]. In addition, the dynamic and stage-dependent nature of postpartum recovery is often insufficiently addressed, despite its critical influence on garment performance and user requirements.

Methodological inconsistencies also hinder the development of coherent evidence. Terminological variation—such as the interchangeable use of “abdominal binders,” “compression garments,” and “shapewear”—complicates cross-study comparison. Furthermore, the lack of standardized reporting for pressure parameters, including measurement methods and pressure magnitudes, limits the establishment of comparable benchmarks [32]. In parallel, subjective evaluations of comfort and usability are frequently conducted independently of objective biomechanical measurements, weakening the linkage between physiological performance and user experience [18, 26].

Collectively, these factors introduce variability, reduce comparability, and impede the accumulation of transferable knowledge. As a result, the field has yet to establish an integrated and systematic framework for postpartum recovery garment design.

4.3 The Missing Link Between Ergonomics and User-Centered Design

A central insight emerging from this review is the lack of systematic integration between ergonomic design principles and user-centered design (UCD) approaches in functional apparel research. Ergonomics provides essential methods for understanding the relationship between body morphology and garment performance, including anthropometric analysis, pressure distribution measurement, and biomechanical evaluation [32, 39]. In contrast, UCD emphasizes experiential dimensions of product use, focusing on user feedback, wear trials, usability assessment, and iterative refinement [23, 30].

Despite their complementary nature, these two perspectives are rarely integrated within a unified design process. Ergonomic studies tend to prioritize structural parameters such as fit and pressure distribution, with limited incorporation of user feedback. Conversely, UCD-oriented studies often rely on subjective evaluations, lacking objective biomechanical validation. This separation constrains the development of systematic and evidence-based design strategies for functional apparel.

To address this gap, the present review proposes an integrated conceptual framework that links body morphology, ergonomic requirements, and user-centered evaluation into a continuous design process. The framework can be described as follows:

Body morphology → Ergonomic requirements → Compression and material decisions → User evaluation → Iterative refinement

Within this framework, body morphology analysis informs the definition of ergonomic requirements, which subsequently guide compression levels, material selection, and structural configuration. These design decisions are then evaluated through user-centered methods, enabling iterative refinement based on both objective performance and subjective experience. This process facilitates the translation of physiological and biomechanical insights into actionable design parameters.

By systematically integrating ergonomics and UCD, this framework bridges the gap between scientific evidence and apparel design practice. It provides a structured pathway for developing postpartum recovery garments that are not only biomechanically effective but also usable and acceptable in real-world contexts.

4.4 Implications for Future Design and Research

The findings of this review provide several important directions for future research and design practice. First, future studies should incorporate three-dimensional body scanning technologies to accurately capture postpartum morphological changes and support localized garment design. Second, pressure measurement techniques should be systematically applied to quantify compression levels, thereby improving comparability across studies. Third, longitudinal wear trials are needed to evaluate the sustained effects of postpartum garments under real-use conditions, as current evidence is largely limited to short-term outcomes.

From a design perspective, the development of body-region-based compression zoning strategies is essential. Differentiated support should be provided according to anatomical structure and functional requirements, rather than relying on uniform compression approaches. In addition, improving the transparency and reproducibility of garment design processes is critical. Explicit reporting of material properties, pressure parameters, and structural configurations would facilitate cross-study comparison and interdisciplinary collaboration.

To address the fragmentation identified in this review, an integrated design framework is proposed, linking postpartum morphology, ergonomic requirements, compression and material decisions, garment structure, and user evaluation within a unified iterative process. This framework provides a structured pathway for translating physiological and ergonomic evidence into actionable design strategies, thereby supporting the development of postpartum recovery garments that are both scientifically grounded and user-centered.

Based on the synthesis of the reviewed literature, an integrated conceptual framework is proposed to link postpartum morphology, ergonomic design requirements, compression strategies, and user-centered evaluation. As illustrated in Figure 2, postpartum morphological changes define the initial design context. These changes inform ergonomic requirements related to garment fit, pressure distribution, and movement compatibility. Compression strategies and material selection translate these requirements into specific garment structures and support zones. User evaluation and wear trials provide feedback on usability and comfort, enabling iterative refinement of design solutions. This integrated process facilitates the translation of clinical and biomechanical evidence into practical garment design and helps bridge the gap between recovery research, compression studies, and functional apparel design.

Table 3 summarizes the key research gaps identified in this review and outlines corresponding directions for future research and design.

Figure 2: Conceptual framework for postpartum recovery garment design integrating morphology, ergonomics, compression strategies, and user-centered evaluation

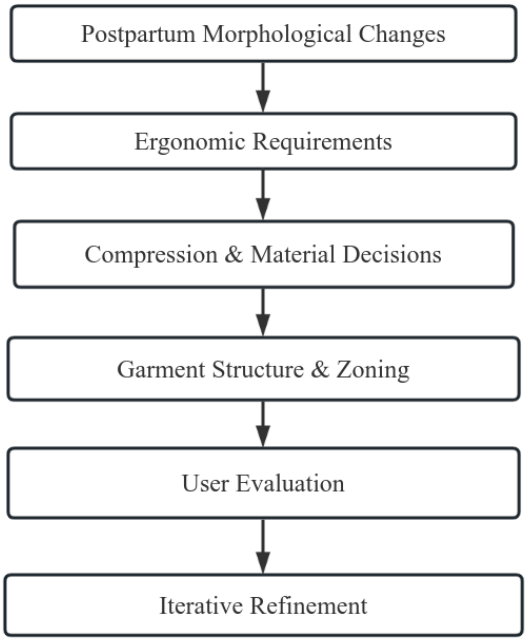


Table 3: Research gaps and future directions in postpartum recovery garment studies

Gap	Future Direction
Lack of body morphology data	Incorporate 3D body scanning
Inconsistent pressure reporting	Standardize pressure measurement protocols
Short-term testing	Conduct longitudinal wear trials
Lack of body-type comparison	Include diverse body types
Limited user-centered evaluation	Integrate UCD methods into design

5. Conclusion

This study systematically examined the existing literature on postpartum recovery garments, integrating findings from clinical research, studies on compression garments, ergonomic apparel design, and user-centered design. The results demonstrate that, despite comprehensive investigation in these domains, the data remains fragmented and fails to establish a unified integrative framework. Three primary study domains were identified: postpartum physiological recovery, compression processes, and functional apparel design. Despite each trajectory providing valuable insights, their little contact has hindered the progress of transferable and evidence-based design concepts. The divergence between ergonomic analysis and user-centered evaluation indicates a notable shortcoming in current research. This study presents a complete conceptual framework that integrates postpartum body morphology, ergonomic requirements, material selection, garment fabrication, and user evaluation into a cyclical design process to address these restrictions. This framework enhances the discipline by providing a systematic mechanism for translating physiological and biomechanical findings into practical garment design techniques. The findings of this review highlight the importance of utilizing multidisciplinary and integrative approaches in future research. To advance the field, we must utilize three-dimensional body data, standardized pressure measurements, long-term wear assessments, and rigorous user-centered design methodologies. Integrating clinical information, engineering concepts, and clothing design methodologies, future research might facilitate the development of postpartum recovery garments that are both scientifically validated and practical for users.

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Conflicts of Interest

The authors declare no conflict of interest.

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