

# Research Advances in Women's Postpartum Health Status

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**Abstract** China is currently experiencing persistently declining birth rates. Postpartum health issues among women represent a significant contributing factor to this trend. As a critical determinant influencing women's fertility decisions and long-term well-being, these health challenges constitute an urgent public health priority. A systematic investigation into women's postpartum health status holds substantial practical significance for the optimization of rehabilitation services and the enhancement of women's health outcomes. Through analysis of recent literature on postpartum health, this review systematically synthesizes the current state of research, both domestically and internationally, across multiple dimensions including physiological, psychological, social support, and specialized interventions. Existing achievements and limitations are summarized, and future research directions are proposed, with the aim of providing a foundation and reference for subsequent investigations.

**Key words** Women, Postpartum health, Health issues

## 0 Introduction

Currently, China faces a continuous decline in fertility rates. In 2024, the national natural population growth rate stood at  $-0.99\%$ <sup>[1]</sup>. This trend is accompanied by a shrinking population of women of reproductive age and a diminishing desire for child-bearing. Maternal postpartum health issues are increasingly recognized as a significant contributing factor to this persistent decline in fertility rates<sup>[2]</sup>. From a global perspective, postpartum health issues remain a pressing public health challenge, significantly impacting women's reproductive choices and long-term health. Data from the World Health Organization (WHO) indicate that at least 40 million women annually may experience long-term health problems arising from childbirth, such as dyspareunia (painful intercourse), low back pain, anal incontinence, and urinary incontinence<sup>[3]</sup>. The postpartum health status of women in China mirrors the global situation, with postpartum psychological issues being particularly prominent<sup>[4]</sup>. In recent years, the implementation of the comprehensive "three-child policy"<sup>[5]</sup> and the rollout of the "Implementation Plan for the Childcare Subsidy System"<sup>[6]</sup> have led to an increase in the number of advanced maternal age pregnancies and high-risk pregnancies<sup>[7]</sup>. This, in turn, has elevated the risks of obstetric complications and comorbidities during pregnancy and childbirth, rendering postpartum health issues increasingly complex and pronounced. Consequently, the demand for comprehensive rehabilitation services has become more urgent. Therefore, conducting in-depth research into women's postpartum health problems and critically analyzing the effectiveness and limitations of existing rehabilitation services is of paramount importance. Such efforts are crucial for timely improvements to the maternal postpartum healthcare service system, guiding primary healthcare institutions in optimizing service delivery processes, and ultimately enhancing the quality of postpartum rehabilitation care.

## 1 Concept of postpartum rehabilitation and postpartum health issues

Postpartum rehabilitation refers to a systematic intervention approach grounded in comprehensive assessment and evaluation, integrating principles from both modern and traditional medicine. It addresses the physiological and psychological issues experienced by women following childbirth or abortion. This multidisciplinary care encompasses injury repair, nutritional guidance, psychological support, infection prevention and control, breastfeeding assistance, and rehabilitative exercises. The overarching goal is to holistically address the health needs of postpartum women, facilitating their gradual restoration to a health status approximating their pre-pregnancy condition<sup>[8]</sup>. Pregnancy and childbirth induce significant changes across multiple physiological systems in women. Some resulting injuries can be irreversible, such as symphysis pubis diastasis, pelvic floor dysfunction, and urogenital tract trauma<sup>[9]</sup>. During the puerperium (the postpartum period) and extending for a considerable duration thereafter, conditions such as breast disorders<sup>[10]</sup>, postpartum pain, nutritional imbalances, psychological abnormalities, and infections are also highly prevalent. Without timely and effective intervention, pelvic floor injuries may progressively worsen with age, leading to functional disorders like pelvic organ prolapse and stress urinary incontinence. Research indicates that the prevalence of symptomatic pelvic organ prolapse among adult women in China is 9.6%<sup>[11]</sup>, while the incidence of postpartum stress urinary incontinence is approximately 18.9%<sup>[12]</sup>. The rate of significant postpartum weight retention (failure to lose pregnancy weight) within 0 – 24 months after delivery reaches 42.6%<sup>[13]</sup>, and the incidence of postpartum depression is approximately 16.0%<sup>[14]</sup>. These health problems often persist for 18 months or longer postpartum, posing a substantial potential threat to women's long-term health and quality of life<sup>[15]</sup>.

## 2 Current research status on postpartum health: domestic and international perspectives

Research on postpartum health is complex and multidimen-

Received: October 25, 2025 Accepted: March 26, 2026

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sional, both domestically and internationally. The health challenges women face after childbirth extend beyond the physiological realm, encompassing psychological well-being and social support, among other critical aspects.

## 2.1 Physiological aspects

**2.1.1 International research status.** Postpartum pelvic floor dysfunction significantly impacts the quality of life of new mothers, and pelvic floor rehabilitation therapy is recognized as a crucial pathway to enhance women's postpartum quality of life<sup>[16]</sup>. Pelvic floor rehabilitation primarily encompasses pelvic floor muscle exercises (e.g., Kegels), biofeedback, electrical stimulation, and pelvic floor rehabilitation training<sup>[17]</sup>. Integrating yoga into pelvic floor rehabilitation for postpartum women demonstrates enhanced efficacy<sup>[18]</sup>. Furthermore, women experience various types of pain or physical discomfort throughout pregnancy, the perinatal period, the puerperium, and often extending well beyond. Pain specifically associated with childbirth and postpartum breastfeeding is particularly prominent. A prospective study revealed a positive correlation between heightened postpartum pain sensitivity and the development of postpartum depression<sup>[19]</sup>. Other research indicates that inadequate postpartum pain management is associated with an increased risk of developing depression and chronic pain between 3 to 12 months postpartum<sup>[20]</sup>. Consequently, regular pain screening and effective management for postpartum women are essential. Scholars advocate for the implementation of systematic pain management strategies specifically designed to address and alleviate the diverse types of pain experienced by women during the breastfeeding period<sup>[21]</sup>. Moreover, breastfeeding can lead to a range of lactation-related issues, creating a demand for timely and professional breast rehabilitation services and breastfeeding guidance. The incidence of mastitis in the postpartum period is reported at 4.4%<sup>[22]</sup>. Common challenges during breastfeeding include insufficient (or oversupply of) milk production, infant latching difficulties, and breast engorgement discomfort. Postpartum women require prompt breast rehabilitation services and breastfeeding support to enhance milk supply, maintain mammary duct patency, and reduce the incidence of mastitis<sup>[23]</sup>. The provision of standardized postpartum breast rehabilitation services and guidance by healthcare professionals is fundamental to ensuring successful breastfeeding, reducing the occurrence of breast diseases, and safeguarding women's long-term breast health for decades following childbirth.

**2.1.2 Domestic research status (China).** Postpartum women in China are susceptible to pelvic floor functional defects<sup>[11-12]</sup>. However, awareness and understanding of pelvic floor rehabilitation methods among these women remain limited. A study<sup>[24]</sup> revealed that 75% of first-time mothers lacked knowledge about preventive measures for postpartum pelvic floor dysfunction. Conversely, 45% expressed a desire for postpartum pelvic floor rehabilitation exercises, and 71% indicated a need for education regarding pelvic floor rehabilitation knowledge.

Currently, several pelvic floor rehabilitation interventions

have been demonstrated to effectively improve pelvic floor function. For instance, the combination of Green Health Education with Kegel pelvic floor rehabilitation training has proven effective in enhancing pelvic floor muscle strength and alleviating stress urinary incontinence among postpartum women<sup>[25]</sup>. Acupuncture combined with electrical stimulation has also demonstrated efficacy in improving urinary incontinence symptoms. Furthermore, incorporating biofeedback effectively strengthens pelvic floor muscle contraction force. Additionally, Kegel exercises combined with electrical stimulation significantly reduce the incidence of pelvic organ prolapse<sup>[26]</sup>. Furthermore, significant challenges persist in breastfeeding practices and mastitis management among pregnant and postpartum women in China<sup>[27]</sup>. Research efforts have explored the application of diverse scientific nursing models to improve the current state of breastfeeding and breast rehabilitation for postpartum women. For example, a study investigating the impact of implementing an 'Integrated Responsibility' Nursing Model on postpartum recovery and common issues concluded that this model reduced the incidence of postpartum urinary retention and breast engorgement while increasing breastfeeding rates<sup>[28]</sup>. Research by Huang *et al.* on breastfeeding management practices and outcomes within the Medical Consortium model found that this approach effectively enhanced breastfeeding self-efficacy and exclusive breastfeeding rates<sup>[29]</sup>. Moreover, Wu *et al.* proposed that an "Internet Plus Hospital - Community - Home Continuity Management Model" significantly improved the mental health status of preterm first-time mothers and increased breastfeeding rates<sup>[30]</sup>. Of particular concern is that women experiencing mastitis often face greater difficulties with breastfeeding and frequently lack access to professional guidance on mastitis management and breastfeeding support<sup>[31]</sup>. Conversely, other scholars have found that an "Internet Plus Manual Milk Expression" approach yields significant benefits. They recommend optimizing the allocation of nursing resources and actively promoting the implementation of this model<sup>[32]</sup>.

## 2.2 Psychological aspects

**2.2.1 International research status.** The prevalence of postpartum depression remains persistently high, with maternal mental health issues occurring frequently; however, the utilization rate of mental health services remains low. Scholars examining the utilization of mental health services by women during pregnancy and postpartum found that among women diagnosed with a mental disorder at their first prenatal appointment, only one-third accessed mental health services during pregnancy or within three months postpartum<sup>[33]</sup>. Nevertheless, several novel psychological interventions have been progressively implemented and demonstrate promising effectiveness. Psychological support interventions based on the Structure - Process - Outcome three-dimensional quality assessment model have been shown to effectively enhance maternal self-efficacy and maternal role adaptation, significantly reduce the incidence of postpartum depression, and play a positive role in its prevention<sup>[34]</sup>. Researchers have developed an internet-based psy-

chological intervention specifically designed to promote maternal mental health<sup>[35]</sup>. Furthermore, maternal mental health status is closely linked to social support. A study involving an anonymous survey of 427 postpartum women elucidated the association between postpartum depression and satisfaction with social support. To prevent postpartum depression, families, acting as informal support providers, should assist with childcare, share household responsibilities, and offer emotional support to the mother<sup>[36]</sup>.

**2.2.2 Domestic research status (China).** While postpartum psychological issues are gaining increasing attention and concern among the general public in China, access to professional and timely psychological screening and intervention services remains insufficient<sup>[37]</sup>. Research analyzing the occurrence of depressive symptoms during the puerperium underscores the critical importance of early depression screening for postpartum women<sup>[38]</sup>. Zhong *et al.*<sup>[39]</sup> developed and validated a postpartum depression risk prediction model, demonstrating its utility in assisting health-care professionals to identify high-risk individuals. Chinese researchers have not only made efforts in the identification and screening of postpartum depression but have also investigated ways to enhance the effectiveness of preventive and interventional strategies. Xu *et al.*<sup>[40-41]</sup> found that modified mindfulness-based intervention programs and solution-focused brief therapy (SFBT) can significantly alleviate depressive and anxiety symptoms in postpartum women and bolster their psychological resilience.

### 2.3 Social support

**2.3.1 International research status.** International research focuses on the modes of social support provision and its relationship with mother-infant attachment. A study<sup>[42]</sup> investigating the impact of perceived social support levels on maternal functioning and mother-infant attachment found that maternal attachment levels increase correspondingly with higher levels of perceived social support. Another study, involving interviews with 18 women receiving social support postpartum in Western Turkey, revealed that mothers do not always desire support provided by both sets of parents. Instead, they prefer support provided by their preferred individuals in a personalized manner<sup>[43]</sup>.

**2.3.2 Domestic research status (China).** Domestic research in China primarily concentrates on the impact of family social support on the physical and mental health of postpartum women, among other directions. Depressive symptoms in postpartum women are associated with perceived social support. The reconstruction of social relationships postpartum holds significant importance for maternal mental health and social adaptation. Postpartum women require social support, particularly informational and appraisal support, which can prevent or reduce the occurrence of postpartum depression<sup>[44]</sup>. Implementing mindfulness-based nursing interventions combined with social support can improve maternal sleep quality, alleviate postpartum anxiety and depressive moods, and enhance social support functioning<sup>[45]</sup>. Regarding physical health, women with postpartum stress urinary incontinence require extensive family support during pelvic floor muscle exercises. Health-

care providers should encourage family members' involvement in postpartum care and establish a multi-faceted family support system to enhance adherence to pelvic floor muscle training<sup>[46]</sup>.

### 2.4 Other distinctive aspects: domestic and international perspectives

**2.4.1 International research status.** On the one hand, postpartum women face the issue of weight retention<sup>[13]</sup> and often lack adequate nutrition and dietary guidance. Weight retention affects nearly half of breastfeeding women, bringing postpartum nutritional and metabolic abnormalities into sharp focus. Research indicates a deficit in postpartum nutrition and dietary counseling for new mothers. Evidence-based nutritional nursing support can empower new mothers to eat well, live well, and care effectively for their newborns<sup>[47]</sup>. A study by Brazilian scholars<sup>[48]</sup> demonstrated that postpartum weight retention is a predictor for the development of obesity. Applying the Dietary Approaches to Stop Hypertension (DASH) diet to nutritional guidance for postpartum women proves beneficial for weight loss; on the other hand, there is a lack of professional and timely postpartum contraception and sexual health guidance for women. A study on postpartum contraceptive counseling revealed<sup>[49]</sup> that 68% of women resumed sexual activity postpartum without using contraception, yet only 18% of them desired another child at that time. Furthermore, few possessed accurate knowledge about optimal birth spacing or postpartum contraception. The majority of respondents (86%) expressed a desire for access to postpartum contraceptive counseling services. Another study focusing on postpartum contraceptive counseling for Arabic-speaking women in Sweden<sup>[50]</sup> highlighted that to provide person-centered and equitable postpartum contraceptive guidance, health-care services need to focus on improving counseling practices. Key elements include integrating the concept of birth spacing into postpartum contraceptive counseling and ensuring accessible follow-up services.

**2.4.2 Domestic research status (China).** A major distinctive feature in China is the application of Traditional Chinese Medicine (TCM) therapies in the realm of postpartum health. TCM-based therapies are widely utilized in postpartum health, particularly for breastfeeding support and breast care. TCM-based nursing interventions have been shown to increase breastfeeding rates, alleviate breast pain, shorten the time to lactogenesis II (milk "coming in") and reduce the duration of breast engorgement, while dynamically elevating prolactin levels and milk production volume<sup>[51]</sup>. Wang *et al.*<sup>[52]</sup> synthesized the evidence supporting acupoint massage for promoting milk secretion in postpartum women, providing a reference basis for the clinical development and standardization of acupoint massage protocols to enhance breastfeeding nursing practices. Zhang *et al.*<sup>[53]</sup> found that auricular acupressure combined with breast massage can increase the rate of exclusive breastfeeding in the early postpartum period and is beneficial for uterine involution. Further research indicates that low-intensity focused ultrasound (LIFU) combined with auricular acupressure effectively promotes lactation, alleviates breast distension and pain,

and enhances the exclusive breastfeeding rate<sup>[54]</sup>. Additionally, studies have found that TCM medicated diet formulas for postpartum hypogalactia can effectively improve maternal constitution and augment milk production<sup>[55]</sup>; another distinctive characteristic is the application of internet technology in postpartum health management.

With the rapid advancement of internet technology, Chinese scholars have begun exploring avenues for applying new technologies in postpartum health management, primarily focusing on the construction of internet-based nursing platforms and the development of novel service models. Research<sup>[56-57]</sup> has created novel postpartum rehabilitation platforms such as "Internet Plus" continuity of care health management platforms for mothers and infants, and intelligent follow-up information platforms for comprehensive antenatal and postnatal care, thereby transforming traditional service delivery models. Other research has concentrated on constructing a new "Internet Plus Hospital – Community – Home" collaborative service model for maternal and infant home care. This model facilitates convenient, rapid, and professional hospital-homogenized nursing care for postpartum women and newborns at home<sup>[58]</sup>. Beyond the construction of internet-based nursing platforms and new models, the internet also enables functions such as online interventions. Studies demonstrate that implementing online postpartum rehabilitation promotion programs for women, or delivering comprehensive nursing interventions via internet platforms, can effectively address early lactation difficulties, enhance exclusive breastfeeding rates, strengthen pelvic floor muscle strength, promote postpartum physical recovery, concurrently improve mothers' health knowledge acquisition, and alleviate negative emotional states<sup>[59]</sup>.

### 3 Conclusions and future directions

This study systematically reviewed and thoroughly analyzed the relevant literature on women's postpartum health status, laying a solid foundation for a comprehensive understanding of maternal health issues. Through a comprehensive examination of pertinent domestic and international research conducted in recent years, the following key insights have been distilled. First, there is widespread recognition of the multidimensional and complex nature of women's postpartum health issues. Maternal health extends beyond the physiological domain, encompassing psychological and social dimensions. This multidimensional research approach facilitates a holistic grasp of maternal health challenges, enabling the provision of more comprehensive and efficient rehabilitation services, ultimately leading to enhanced overall well-being for postpartum women. Second, the significance of individual differences in postpartum health challenges is increasingly prominent. Factors such as diverse national cultural backgrounds and geographical disparities can exert substantial influences on maternal health. Finally, postpartum health service models are undergoing continuous innovation and optimization. The forms and content of services are continually expanding and evolving-transitioning from traditional

hospital-dominated models, to community-based frameworks, and now incorporating the integration of emerging internet platforms. These innovative initiatives not only enhance service accessibility but also drive the high-quality development of postpartum rehabilitation services.

While existing research on women's postpartum health status has yielded some progress, its scope and depth remain limited. Future investigations are therefore recommended to pursue the following avenues. First, the pursuit of granular research across multiple dimensions is essential. Although the multidimensional nature of postpartum health issues is recognized in current research, future studies should achieve greater granularity by delving into the specific mechanisms of interaction among physiological, psychological, and social factors. Potential foci include elucidating the relationship between postpartum depression and physical health, or mapping the precise pathways through which social support influences maternal psychological well-being. Furthermore, the development of more precise assessment tools is warranted to quantify maternal health challenges, thereby providing a more robust scientific foundation for personalized rehabilitation plans. Second, empirical research on individualized rehabilitation programs is needed. Given the critical importance of individual variability in postpartum care, enhanced empirical investigation into tailored rehabilitation programs is imperative. Validation could be undertaken to assess the efficacy of personalized plans, particularly their applicability across diverse cultural contexts and geographical settings. Research should determine how rehabilitation protocols can be adapted to align with the cultural practices and belief systems of postpartum women. Exploration of innovative models leveraging telemedicine or community-based health services could enhance postpartum care in remote areas, addressing disparities in healthcare access. Longitudinal tracking of maternal health status at key postpartum intervals (*e.g.*, 6 weeks, 3 months, 6 months) is crucial for evaluating the long-term effectiveness of individualized programs. Third, active exploration of the application of frontier technologies, such as artificial intelligence (AI) and telemedicine, in postpartum rehabilitation services is essential for optimizing service quality and efficiency. Research efforts could focus on enhancing the precision of AI algorithms in postpartum health monitoring. This could involve leveraging wearable sensors for real-time collection of maternal physiological data, integrated with AI analytical models, to enable early warning and intervention for postpartum complications. The development and application of intelligent robots also hold significant promise for promoting maternal health, assisting with childcare, and providing guidance and counseling. Such technologies offer the potential to substantially reduce caregiver burden while enhancing the standardization and human-centered nature of services. Further exploration could target the intelligent enhancement of telemedicine platforms through the development of more interactive and personalized rehabilitation guidance systems. Examples include virtual rehabilitation assistants and intelligent rehabilitation plan generators, designed to deliver a

wider spectrum of services. Concurrently, research is needed to optimize the mechanisms for information sharing and coordinated service delivery between community and hospital settings using technological solutions. This would ensure seamless and integrated rehabilitation support for women throughout all phases of their recovery.

In conclusion, future research should build upon existing findings to deepen the understanding of postpartum health challenges in women. The exploration of more effective postpartum rehabilitation service models is paramount, aiming to provide women with more comprehensive, personalized, and efficient support. This approach is vital for advancing maternal and child health outcomes at a population level.

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