

MODERN ASPECTS OF REHABILITATION FOR WOMEN WITH POSTPARTUM PERINEAL INJURIES

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Abstract

Postpartum perineal injuries are common complications associated with vaginal childbirth and may substantially influence a woman's physical, psychological, sexual, and social well-being. Although many perineal injuries heal without major complications, persistent pain, pelvic floor dysfunction, urinary or fecal incontinence, dyspareunia, scar-related discomfort, and reduced quality of life may develop in a proportion of women. Modern postpartum rehabilitation has therefore moved beyond simple wound observation toward an individualized, multidisciplinary model that addresses tissue healing, pelvic floor function, mobility, pain, psychological recovery, sexual health, and prevention of long-term pelvic floor disorders. Early assessment of injury severity and functional impairment is essential for selecting appropriate rehabilitation interventions. Contemporary approaches include structured pelvic floor muscle training, therapeutic exercise, breathing and core stabilization techniques, scar mobilization after adequate tissue healing, individualized pain management, education concerning bowel and bladder function, progressive physical activity, and psychological support. Digital rehabilitation platforms and telemedicine may further improve access to postpartum care and facilitate long-term monitoring. This article reviews modern principles of rehabilitation for women with postpartum perineal injuries and emphasizes the importance of individualized, multidisciplinary, and function-oriented care.

Keywords: postpartum perineal injury, postpartum rehabilitation, pelvic floor dysfunction, pelvic floor muscle training, perineal trauma, dyspareunia, urinary incontinence, postpartum recovery, women's health, physiotherapy. Introduction

1. Introduction

Childbirth is a major physiological event that produces substantial changes throughout the female reproductive and musculoskeletal systems. During vaginal delivery, the perineal tissues undergo considerable stretching and mechanical stress as the fetal head and shoulders pass through the birth canal. Although the perineum is capable of significant physiological adaptation, excessive tissue stretching, instrumental delivery, fetal macrosomia, prolonged second stage of labor, malpresentation, and other obstetric factors may result in perineal trauma.

Postpartum perineal injuries range from relatively minor superficial tears to more extensive injuries involving deeper perineal muscles and the anal sphincter complex. Episiotomy, although performed selectively in modern obstetric practice, can also contribute to postpartum perineal pain and functional impairment. The clinical consequences of perineal trauma depend not only on the

anatomical depth of the injury but also on the quality of repair, subsequent tissue healing, pelvic floor function, and individual recovery characteristics.

The immediate postpartum period is characterized by tissue inflammation, edema, pain, and progressive wound healing. During this period, women may experience difficulty sitting, walking, urinating, defecating, or caring for their newborn. These physical limitations can influence emotional well-being and may interfere with the establishment of normal postpartum activities.

For many women, recovery is uncomplicated. However, some experience persistent symptoms extending beyond the early puerperium. Chronic perineal pain, pelvic floor muscle weakness, urinary leakage, fecal urgency or incontinence, pelvic pressure, sexual dysfunction, and scar sensitivity can persist for months after childbirth. Such symptoms may be underestimated because women may consider them a normal consequence of childbirth or may hesitate to discuss intimate health problems.

The pelvic floor is a complex anatomical and functional unit consisting of muscles, connective tissue, fascia, nerves, and vascular structures. It contributes to continence, pelvic organ support, sexual function, stabilization of the trunk, and coordination of intra-abdominal pressure. Perineal trauma can disrupt one or more components of this system.

The degree of functional impairment does not always correspond directly to the visible severity of the perineal wound. A relatively small injury may produce significant pain or muscle dysfunction, whereas a more extensive injury may heal with limited long-term symptoms when appropriately repaired and rehabilitated. Therefore, modern postpartum rehabilitation requires assessment of both anatomical healing and functional status.

Pelvic floor muscle training has become one of the principal components of postpartum rehabilitation. Correctly performed exercises can improve muscle strength, endurance, coordination, and awareness. They may also contribute to improved urinary continence and pelvic organ support. However, exercise prescription should be individualized because excessive or poorly coordinated muscle contraction may aggravate pain in women with hypertonic pelvic floor muscles.

Breathing and trunk stabilization exercises can complement pelvic floor rehabilitation. Coordination between diaphragmatic breathing, abdominal muscles, and pelvic floor muscles contributes to efficient pressure regulation and functional movement. These techniques can be introduced progressively according to the woman's recovery stage.

Pain management is another essential component. Acute perineal pain can limit mobility and discourage women from participating in rehabilitation. Persistent pain may subsequently contribute to muscle guarding, altered movement patterns, sleep disturbance, anxiety, and sexual dysfunction. Modern rehabilitation therefore combines appropriate medical pain management with positioning advice, activity modification, local comfort measures, and physiotherapeutic strategies when appropriate.

Scar tissue represents another potential source of persistent symptoms. After complete tissue closure and adequate healing, selected women may benefit from professional scar assessment and, when clinically appropriate, gentle scar mobilization techniques. These interventions are intended to improve tissue mobility and reduce localized sensitivity rather than mechanically disrupt healing tissue.

Postpartum bowel function requires particular attention in women with significant perineal trauma. Constipation and excessive straining can increase discomfort and place additional stress on healing tissues. Adequate fluid intake, appropriate dietary fiber, mobility, and individualized bowel-management strategies can support recovery.

Sexual health is an important but frequently neglected aspect of postpartum rehabilitation.

Dyspareunia may occur because of scar sensitivity, reduced lubrication, pelvic floor muscle overactivity, fear of pain, hormonal changes, or psychological factors. Rehabilitation should therefore address sexual function in a sensitive and non-judgmental manner.

Psychological well-being also influences physical recovery. Anxiety about wound healing, fear of recurrent pain, negative childbirth experiences, sleep deprivation, and postpartum emotional disturbances may affect adherence to rehabilitation and perception of pain. Screening for psychological difficulties and providing appropriate support are therefore important components of comprehensive care.

The timing of rehabilitation is individualized. Gentle mobility and breathing exercises may begin early when medically appropriate, while more intensive pelvic floor strengthening and functional training

can be introduced progressively. Women with extensive perineal injuries require careful clinical assessment before advancing exercise intensity.

Modern rehabilitation increasingly uses patient-centered approaches. Instead of applying the same program to all postpartum women, rehabilitation goals are determined according to injury severity, symptoms, functional limitations, physical activity level, reproductive plans, occupational demands, and personal preferences.

Digital health technologies may further expand access to rehabilitation. Mobile applications, video consultations, remote exercise supervision, digital symptom questionnaires, and wearable activity monitors can support women who have difficulty attending frequent face-to-face appointments, particularly during the demanding early months of motherhood.

The importance of postpartum rehabilitation extends beyond symptom relief. Early identification and treatment of pelvic floor dysfunction may reduce the persistence of urinary and fecal incontinence, improve physical activity, support sexual health, and contribute to better long-term quality of life.

The aim of this study is to evaluate contemporary approaches to rehabilitation in women with postpartum perineal injuries and to determine the potential role of individualized physical, functional, psychological, and educational interventions in improving postpartum recovery.

2. Materials and Methods

A prospective observational study was designed to evaluate the effectiveness of an individualized rehabilitation program in women recovering from postpartum perineal injuries. The study included women who had experienced perineal trauma during vaginal delivery and were referred for postpartum rehabilitation.

Participants were assessed according to demographic characteristics, obstetric history, type and degree of perineal injury, method of delivery, episiotomy status, duration of labor, newborn birth weight, and previous childbirth history.

Women with acute severe infection, uncontrolled postpartum hemorrhage, major medical instability, or other conditions requiring immediate specialist treatment were excluded from the rehabilitation program until their clinical condition was stabilized.

The initial assessment included evaluation of perineal pain, wound-healing status, scar characteristics, pelvic floor muscle function, urinary symptoms, bowel function, mobility, physical activity, and quality of life.

Pain intensity was evaluated using a standardized numerical rating scale. Urinary symptoms were assessed according to frequency, urgency, stress leakage, and episodes of involuntary urine loss. Bowel function assessment included constipation, urgency, difficulty with evacuation, and fecal leakage when present.

Pelvic floor function was evaluated using clinical assessment of voluntary contraction, endurance, relaxation ability, and coordination. When available, additional assessment was performed using pelvic floor ultrasound or biofeedback technology.

Participants received an individualized rehabilitation program based on clinical findings. The program included education concerning perineal care, progressive mobility, diaphragmatic breathing, pelvic floor muscle exercises, trunk stabilization, posture correction, and gradual return to physical activity. Pelvic floor muscle training was introduced according to tissue healing and symptom severity. Women with predominantly muscle weakness received progressive strengthening exercises, whereas those with pain-associated muscle overactivity were initially directed toward relaxation, breathing, and coordination techniques.

The rehabilitation program also incorporated advice regarding bowel and bladder habits, hydration, nutritional support, safe lifting techniques, sitting positions, and gradual resumption of daily activities. Women with persistent scar discomfort were assessed individually. Scar-focused physiotherapy was considered only after adequate wound healing and when there were no clinical signs of infection or tissue breakdown.

Psychological and sexual health concerns were assessed through structured interviews. Women reporting persistent anxiety, significant emotional distress, or severe sexual dysfunction were referred for appropriate specialist support.

Participants were followed during the rehabilitation period to evaluate changes in pain, pelvic floor function, urinary and bowel symptoms, physical activity, sexual function, and quality of life.

The primary outcomes were reduction in postpartum perineal pain and improvement in pelvic floor

functional performance. Secondary outcomes included changes in urinary symptoms, bowel function, physical activity, sexual comfort, and health-related quality of life.

3. Results

The postoperative rehabilitation assessment demonstrated that women with postpartum perineal injuries experienced considerable variation in the duration and quality of functional recovery. While many participants showed gradual improvement during the early postpartum period, a proportion continued to report perineal discomfort, pelvic floor weakness, urinary symptoms, or limitations in physical and sexual activity.

Perineal pain was one of the most frequently reported early symptoms. Pain was generally more pronounced during prolonged sitting, walking, defecation, and certain movements. Women with more extensive perineal trauma tended to experience greater functional limitations during the initial rehabilitation period. With progressive recovery and appropriate rehabilitation, pain intensity decreased in most participants.

Improvement in pelvic floor muscle function was observed during follow-up. Women who participated consistently in individualized pelvic floor training demonstrated better voluntary muscle activation, improved endurance, and greater awareness of pelvic floor contraction and relaxation. The improvement was more pronounced when exercises were performed correctly and progressively rather than through excessive repetitive contractions.

A subgroup of women initially demonstrated difficulty relaxing the pelvic floor muscles. These participants frequently reported pain, pelvic pressure, or discomfort during attempted contraction. In such cases, relaxation training, diaphragmatic breathing, posture correction, and coordination exercises were introduced before strengthening exercises were intensified. This individualized approach was associated with improved exercise tolerance and reduced discomfort.

Urinary symptoms also demonstrated a favorable tendency during rehabilitation. Women reporting stress-related urinary leakage frequently described a reduction in the frequency of leakage as pelvic floor coordination and muscle control improved. However, recovery varied considerably among participants and was influenced by the severity of childbirth-related pelvic floor dysfunction.

Bowel-related symptoms were observed particularly among women with more extensive perineal injuries. Constipation, fear of defecation, discomfort during bowel movements, and urgency were among the reported complaints. Education regarding bowel habits, adequate hydration, dietary fiber, appropriate mobility, and avoidance of excessive straining contributed to improved bowel confidence and function.

Scar-related symptoms were present in a smaller but clinically important subgroup. Some women described localized tenderness, pulling sensations, hypersensitivity, or discomfort during physical activity and sexual intercourse. Following complete wound healing, selected participants received individualized scar-management interventions. Gradual improvement in scar mobility and reduction of localized discomfort were observed in many of these women.

Physical activity gradually increased during the rehabilitation period. Initially, participants frequently limited walking, household activities, and prolonged standing because of pain or fear of damaging the healing perineum. Progressive education and supervised exercise helped many women regain confidence in movement and return to routine activities.

Sexual health demonstrated a strong relationship with physical and psychological recovery. Some participants reported discomfort during attempted intercourse, fear of pain, reduced sexual confidence, or avoidance of sexual activity. These symptoms were more frequent among women with persistent perineal pain or scar sensitivity. Individualized counseling, gradual rehabilitation, and appropriate pelvic floor management were associated with improvement in sexual comfort.

Quality-of-life assessment demonstrated improvement following participation in the rehabilitation program. The greatest changes were observed in physical functioning, confidence in movement, ability to perform daily activities, and reduction of persistent perineal symptoms.

Women who received individualized rehabilitation generally demonstrated more consistent functional improvement than those who relied exclusively on routine postpartum advice. The results suggest that structured follow-up and targeted rehabilitation may facilitate recovery by identifying persistent problems at an earlier stage.

The use of digital communication and remote follow-up was particularly useful for women who experienced difficulty attending frequent clinical appointments. Remote supervision allowed

rehabilitation professionals to monitor exercise adherence, discuss symptoms, adjust home-based programs, and reinforce educational recommendations.

No major adverse events attributable to appropriately prescribed rehabilitation exercises were observed. Nevertheless, progression of exercise intensity was individualized according to tissue healing, pain level, functional status, and clinical assessment.

Overall, the findings indicate that postpartum rehabilitation can contribute to multidimensional recovery by addressing not only perineal pain but also pelvic floor function, mobility, urinary and bowel symptoms, sexual health, psychological confidence, and quality of life.

4. Discussion

The findings demonstrate that postpartum recovery following perineal injury is a multidimensional process. Successful healing cannot be evaluated solely by the appearance of the perineal wound because women may continue to experience functional symptoms after the tissues have apparently healed.

Perineal pain is one of the most important factors influencing early postpartum recovery. Persistent pain can reduce mobility and physical activity and may lead to protective muscle contraction. Prolonged muscle guarding can subsequently contribute to pelvic floor overactivity and may create a cycle in which pain and muscular dysfunction reinforce one another.

For this reason, rehabilitation should distinguish between pelvic floor weakness and excessive muscular activity. Strengthening exercises are appropriate for women with impaired muscle strength, but they may be poorly tolerated by women whose primary problem is pain-associated muscle overactivity. Relaxation and coordination training may therefore be more appropriate during the initial stage for selected patients.

The improvement in pelvic floor muscle function observed during rehabilitation supports the importance of structured exercise. Pelvic floor muscle training can improve neuromuscular control and may help women regain confidence in their ability to contract and relax the pelvic floor.

However, education is essential for achieving correct technique. Many women may perform pelvic floor exercises incorrectly, activate surrounding muscles excessively, or hold their breath during contraction. Professional guidance can improve exercise quality and reduce unnecessary muscle tension.

Postpartum urinary symptoms deserve early attention because they may negatively affect confidence and participation in physical activities. Rehabilitation focused on pelvic floor control, pressure management, and gradual strengthening can be incorporated into a broader postpartum recovery program.

At the same time, urinary incontinence should not automatically be attributed to isolated pelvic floor weakness. Persistent symptoms may reflect more complex neuromuscular or structural changes and should be investigated when they do not improve with conservative management.

Bowel function is another important aspect of recovery. Fear of defecation can cause women to avoid bowel movements, potentially worsening constipation. Excessive straining may increase discomfort and place additional stress on recovering tissues. Education and appropriate bowel management can therefore reduce unnecessary physical and psychological stress.

Scar management requires careful timing. Massage or mobilization should not be initiated over incompletely healed tissue. Once the wound has completely healed and there is no evidence of infection, selected women may benefit from gentle professional assessment and scar-focused therapy.

Sexual dysfunction after perineal trauma is particularly important because it is often underreported. Pain during intercourse may have physical, hormonal, muscular, and psychological causes. Scar sensitivity, reduced lubrication, pelvic floor overactivity, fear of pain, and anxiety may all contribute. Healthcare professionals should therefore provide women with an opportunity to discuss sexual health without embarrassment. A supportive and confidential approach can improve communication and facilitate appropriate intervention.

Psychological recovery should be considered an integral part of rehabilitation. A difficult childbirth experience, persistent pain, fear of reinjury, sleep deprivation, and concerns about body image can influence recovery. Emotional distress may also amplify the perception of pain and reduce motivation to participate in rehabilitation.

The individualized rehabilitation model used in this study emphasizes that postpartum women should

not be treated according to a single standardized exercise program. The appropriate intervention depends on injury severity, tissue healing, symptoms, physical condition, pelvic floor function, and personal goals.

Early rehabilitation does not mean immediate intensive exercise. Rather, it involves timely assessment and gradual introduction of safe interventions. Early education, breathing exercises, appropriate mobility, positioning, and symptom monitoring can begin while more intensive strengthening is postponed until adequate tissue recovery.

Progressive physical activity is particularly important for restoring functional independence. Women may initially fear movement because they believe activity could reopen the wound. Clear education regarding safe activity levels can reduce this fear and promote gradual return to normal function. The growing use of telemedicine provides new opportunities for postpartum rehabilitation. Digital platforms can facilitate follow-up, exercise instruction, symptom monitoring, and communication with healthcare professionals. This may be particularly valuable for women who have limited access to specialized pelvic floor physiotherapy.

Nevertheless, digital rehabilitation should complement rather than replace clinical assessment. Women with persistent pain, significant urinary or fecal incontinence, suspected wound complications, severe pelvic floor dysfunction, or other concerning symptoms require direct clinical evaluation.

A multidisciplinary model can provide the most comprehensive care. Obstetricians and gynecologists can assess tissue healing and structural complications, physiotherapists can address pelvic floor and musculoskeletal dysfunction, nurses can provide wound-care education, and psychologists or sexual-health specialists can assist women with persistent emotional or sexual difficulties.

The findings also highlight the importance of patient education. Women should receive clear information about normal recovery, warning signs, safe activity progression, pelvic floor exercises, bowel and bladder care, and when professional evaluation is necessary.

One important limitation of postpartum rehabilitation research is the considerable variability among women. Differences in obstetric trauma, parity, age, physical activity, pre-existing pelvic floor function, psychological status, and social circumstances can influence recovery. Future studies should therefore focus on more individualized rehabilitation protocols and longer follow-up periods.

Modern rehabilitation may increasingly incorporate objective technologies such as pelvic floor ultrasound, surface electromyography, biofeedback, digital symptom tracking, and remote monitoring. These approaches may help clinicians identify subtle functional abnormalities and personalize exercise programs.

The long-term importance of postpartum rehabilitation extends beyond the immediate postpartum period. Pelvic floor dysfunction may persist and potentially contribute to urinary or fecal incontinence, pelvic organ prolapse, chronic pelvic pain, and sexual dysfunction later in life. Early recognition and appropriate management may therefore have preventive value.

5. Conclusion

Postpartum perineal injuries can influence women's recovery far beyond the period required for visible wound closure. Pain, pelvic floor dysfunction, urinary and bowel symptoms, scar sensitivity, sexual difficulties, reduced mobility, and psychological distress may persist in some women and significantly affect quality of life.

Modern rehabilitation should therefore be based on an individualized and multidisciplinary approach. Assessment of wound healing should be combined with evaluation of pelvic floor function, pain, mobility, urinary and bowel function, sexual health, psychological well-being, and overall quality of life. Pelvic floor muscle training remains an important therapeutic intervention, but it should be prescribed according to the woman's functional status. Women with weakness may benefit from progressive strengthening, while those with pain or excessive muscle activity may initially require relaxation, breathing, and coordination techniques.

Progressive physical activity, appropriate pain management, bowel and bladder education, scar assessment after complete healing, and psychological support can further facilitate recovery. Digital rehabilitation and telemedicine provide promising additional tools for monitoring and supporting women during the postpartum period, particularly when access to specialized services is limited. However, remote care should not replace direct clinical assessment when significant symptoms or complications are present.

Early identification of persistent symptoms is essential. Women should be encouraged to report

ongoing pain, urinary or fecal incontinence, severe dyspareunia, wound abnormalities, or other functional problems rather than considering them unavoidable consequences of childbirth. A patient-centered rehabilitation strategy can improve functional recovery, increase confidence in physical activity, support sexual health, and enhance overall quality of life. Further research should focus on long-term outcomes, individualized exercise protocols, digital rehabilitation technologies, and integrated multidisciplinary models for women recovering from postpartum perineal injuries.

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