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Narrative Review

Fragmented provision of pelvic health physiotherapy in obstetric fistula care across sub-Saharan Africa: A narrative review

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Abstract

Pelvic health physiotherapy is an important component of comprehensive obstetric fistula care, addressing pelvic floor dysfunction, pelvic girdle pain, lower back pain, abdominal weakness, and other physical sequelae associated with prolonged obstructed labor and obstetric fistula. Although specialized training and evidence-based rehabilitation protocols are established in several high-income countries, the availability and integration of these services remain limited across much of sub-Saharan Africa. Rehabilitation for women affected by obstetric fistula is frequently characterized by hospital-centered service delivery, limited continuity of care after discharge, insufficient attention to sexual health, and inadequate long-term functional follow-up. These challenges reflect broader disparities in rehabilitation workforce capacity, service organization, and the availability of context-specific evidence. The aim of this narrative review is to examine the fragmentation of pelvic health physiotherapy provision within obstetric fistula care across sub-Saharan Africa, explore its underlying structural and clinical dimensions, and propose a context-responsive framework to strengthen integrated, continuous, and culturally appropriate rehabilitation services.

Keywords: Pelvic health physiotherapy, pelvic floor rehabilitation, sexual health, continuity of care, sub-Saharan Africa

Introduction

Pelvic health physiotherapy is a specialized area of physiotherapy that encompasses comprehensive assessment, conservative treatment, and rehabilitation for conditions affecting pelvic floor function, pelvic girdle health, the lower back, the hips, and abdominal musculature [1,2]. Within obstetric fistula (OF) care, it addresses the physical and functional sequelae associated with OF, sometimes collectively referred to as the "obstetric fistula complex." These sequelae may include foot drop, diastasis recti abdominis, pelvic girdle pain, and urinary or fecal incontinence, with the ultimate aims of alleviating symptoms, improving quality of life, and facilitating the restoration of previous activity and functional levels [3-5]. Over the past four decades, pelvic health physiotherapy has become increasingly integrated into multidisciplinary care pathways, particularly in high-income countries. Academic and clinical institutions in Europe, North America, and Australia have established evidence-based rehabilitation protocols, developed specialized training opportunities for physiotherapists, and increasingly incorporated digital health and telehealth platforms to improve service accessibility [6,7].

However, the development and availability of pelvic health physiotherapy in sub-Saharan Africa remain considerably limited. Compared with the progress made in several high-income

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countries, the specialty remains underdeveloped, emerging, or critically under-resourced in many parts of the region [8,9]. Where available, services are predominantly delivered within hospital settings, with limited follow-up after discharge and insufficient attention to sexual health and long-term functional reintegration [8,10]. Rehabilitation provision may also be constrained by high patient workloads, inadequate diagnostic and assessment resources, and limited hospital stays, resulting in brief and sometimes fragmented interventions rather than comprehensive, individualized care [8,11]. Consequently, rehabilitation may address immediate postoperative needs without adequately addressing the broader and longer-term physical, functional, and sexual health concerns of women affected by OF.

This review is guided by three central questions: (1) How is pelvic health physiotherapy conceptualized and delivered across sub-Saharan Africa? (2) In what ways do existing healthcare delivery models for OF care reflect broader rehabilitation gaps? (3) What strategies could help address these gaps? Although existing empirical studies from sub-Saharan Africa predominantly focus on postoperative rehabilitation following OF repair, the physical and functional consequences of OF necessitate a broader approach encompassing preoperative assessment, postoperative rehabilitation, and long-term follow-up. The available evidence therefore provides an opportunity to examine both the feasibility of integrating physiotherapy into OF care and the persistent structural and service-delivery barriers that constrain its broader implementation across the region. Importantly, findings from postoperative rehabilitation studies should be interpreted within the scope of the interventions and populations investigated rather than as comprehensive representations of pelvic health physiotherapy provision across sub-Saharan Africa.

Sub-Saharan Africa is a highly diverse region in terms of language, legal systems, socioeconomic conditions, and healthcare structures. This heterogeneity complicates efforts to characterize pelvic health physiotherapy practice uniformly across the region [12,13]. Workforce capacity, service organization, and access to rehabilitation services vary substantially between countries. For instance, recent data indicate that Uganda has approximately 0.10 practicing physiotherapists per 10,000 population, whereas South Africa has approximately 1.47 practicing physiotherapists per 10,000 population, highlighting the major differences in rehabilitation workforce availability across the region [14,15]. Furthermore, rehabilitation services are shaped by diverse healthcare financing mechanisms, insurance structures, linguistic context, and models of service delivery. Consequently, workforce shortages, limited specialist training, restricted access to community-based rehabilitation, and inequitable service distribution may represent common manifestations of fragmentation, although the underlying mechanisms differ across settings [8,13]. The systemic barriers discussed in this review should therefore be interpreted within the specific regional, political, socioeconomic, and health-system contexts in which they occur.

For the purpose of this review, fragmentation in the provision of pelvic health physiotherapy within OF care is defined as multi-dimensional discontinuity in how rehabilitation services are conceptualized, distributed, and delivered [16-18]. This fragmentation is characterized by five interrelated dimensions: (a) geographical inequity, whereby specialized services are concentrated in high-income countries and selected urban centers while remaining significantly absent in low- and middle-income settings that may have substantial rehabilitation needs [19]; (b) structural boundedness, whereby rehabilitation is predominantly organized within hospital settings and often terminates upon discharge rather than extending into patients' homes and communities throughout the continuum of recovery [20]; (c) thematic omission, whereby important dimensions of pelvic health, particularly sexual health and long-term rehabilitation, are systematically excluded from rehabilitation protocols and outcome frameworks [21]; (d) workforce and sectoral siloing, whereby specialist practitioners are concentrated in private healthcare and/or tertiary facilities, potentially limiting access among populations most likely to benefit from these services [22]; (e) epistemological misalignment, whereby the evidence informing clinical practice is generated predominantly from populations in high-income countries and may insufficiently reflect the clinical, cultural, and resource-related realities of settings experiencing substantial rehabilitation needs [23].

Accordingly, the aim of this review is to examine the multidimensional fragmentation of pelvic health physiotherapy provision within OF care across sub-Saharan Africa, describe its underlying mechanisms and manifestations, and propose a context-responsive framework for strengthening service delivery. By synthesizing available regional evidence and intervention experiences, the review seeks to inform the development of more integrated, continuous, equitable, and contextually appropriate pelvic health rehabilitation services for women affected by OF.

Obstetric fistula in sub-Saharan Africa: Clinical context, experiences, and evidence

OF, an abnormal communication between the vagina and bladder or rectum, commonly resulting from prolonged obstructed labor, remains one of the most devastating consequences of inadequate maternal care that disproportionately affects sub-Saharan Africa and South Asia [24-26]. Apart from the immediate morbidity of uncontrollable urinary/fecal incontinence, OF is associated with profound social stigma, depression, and long-term physical sequelae including pelvic floor dysfunction, foot drop, contractures, chronic pelvic girdle pain, and sexual dysfunction [27-29]. Accordingly, the rehabilitation needs of women affected by OF extend beyond the resolution of incontinence and require attention to both immediate functional impairments and longer-term physical, psychosocial, and sexual health outcomes. Pelvic health physiotherapy represents an important component of this broader rehabilitation approach.

Evidence from physiotherapy programs implemented in Tanguieta, Benin; Addis Ababa, Ethiopia; and Mulago, Uganda, suggests that structured rehabilitation can be incorporated into existing OF care pathways and may contribute to improved recovery outcomes [25,30-34]. Common interventions included pelvic floor muscle training, core strengthening, bladder training, and patient education. Reported outcomes included improvements in pelvic floor muscle strength, continence, and quality of life. However, these interventions varied considerably in design, and their reported benefits cannot be attributed exclusively to physiotherapy, particularly where rehabilitation was delivered as part of broader multidisciplinary interventions. For example, the Ugandan pilot intervention led by Barageine *et al*. incorporated physiotherapy alongside psychosocial support, health education, and economic empowerment. Such studies provide important evidence regarding the feasibility, safety, and acceptability of integrated rehabilitation approaches, but do not establish the independent effectiveness of pelvic health physiotherapy. Despite these advances, examination of the available evidence reveals several persistent limitations in the organization and delivery of rehabilitation services.

First, rehabilitation pathways remain predominantly hospital-centered, with limited continuity following discharge. Although some intervention models have incorporated extended postoperative monitoring, such as the Mulago multidisciplinary intervention, which provided physiotherapy, psychosocial support, and economic empowerment alongside follow-up assessments at 6 weeks, 3 months, and 6 months after surgery [25], such approaches remain relatively uncommon in the published literature. In most OF care programs, physiotherapy is concentrated within hospital settings, with limited evidence of structured mechanisms for continuing rehabilitation after discharge. At Hamlin Fistula Hospital in Addis Ababa, physiotherapy has been incorporated into both preoperative and postoperative care for women undergoing fistula repair, reflecting recognition of the rehabilitation needs associated with OF [35]. Nevertheless, the availability of hospital-based rehabilitation does not necessarily ensure continuity of care once women return to their communities. The absence of structured follow-up and community-based rehabilitation pathways may leave important functional needs inadequately addressed, particularly as recovery extends beyond fistula closure to include restoration of physical function, social relationships, and economic participation. This gap between hospital-based intervention and longer-term recovery represents an important dimension of fragmentation in OF rehabilitation.

Second, sexual health remains insufficiently integrated into published rehabilitation interventions and clinical protocols. The physical and psychosocial consequences of OF for sexual health are well documented and may include vaginal stenosis, dyspareunia, fear of reinjury, and

reduced sexual confidence [34,36,37]. Despite these recognized consequences, explicit components addressing sexual health, such as specialized counseling and targeted rehabilitation for sexual dysfunction, are rarely described in the operational details of published OF rehabilitation programs. Although international clinical guidance increasingly recognizes sexuality as an important component of comprehensive pelvic health, its limited representation in rehabilitation protocols may reflect broader cultural, institutional, and service-delivery barriers to addressing women's sexual health within routine postoperative care [37]. Consequently, successful fistula closure and improvements in urinary or fecal continence may not adequately capture the broader recovery needs of affected women, particularly those related to sexual function, intimate relationships, and psychosocial well-being.

Third, evidence regarding the long-term outcomes of OF rehabilitation remains limited. One notable example is the follow-up study by Castille *et al*. in Benin, which assessed women at 3, 6, and 12 months after surgery and reported sustained improvements in continence and quality of life. Similarly, the Mulago pilot intervention incorporated postoperative assessments at 6 weeks, 3 months, and 6 months [24]. Nevertheless, relatively few published studies have examined whether early postoperative improvements are maintained beyond the first year or translate into sustained participation in family, community, sexual, and economic life. Consequently, the available evidence remains weighted toward short- and medium-term clinical outcomes, while the longer-term functional recovery and social reintegration of women following OF repair remain insufficiently characterized [38]. This limitation also constrains the development of evidence-informed rehabilitation pathways that extend beyond the immediate postoperative period.

Finally, the availability and implementation of rehabilitation services remain inconsistent across OF care settings. Evidence from Uganda illustrates several of the practical barriers affecting rehabilitation provision. A qualitative study conducted at Kitovu Mission Hospital identified limited resources, inadequate follow-up, insufficient counseling, and budgetary constraints as challenges affecting rehabilitation services. Notably, only one participant with an unrepaired fistula reported awareness of available rehabilitation services, suggesting potential gaps in service visibility, patient education, and access among women affected by OF [39]. These findings are consistent with broader evidence from sub-Saharan Africa. A systematic review of rehabilitation practices in childbirth-related pelvic fistula identified relatively few studies describing physiotherapy interventions and concluded that rehabilitation remains inconsistently implemented and supported by a limited evidence base [40]. Although surgical repair remains central to OF management, the comparatively limited integration and evaluation of rehabilitation services may leave important physical, functional, psychosocial, and sexual health needs insufficiently addressed, including among women who achieve successful fistula closure [40]. Collectively, these findings highlight the need to move beyond a predominantly surgery-centered approach toward more integrated rehabilitation pathways that address the continuum of recovery.

Workforce capacity and inequities in pelvic health physiotherapy provision

A major constraint on rehabilitation service provision across sub-Saharan Africa is the persistent shortage and unequal distribution of physiotherapy personnel. Evidence from French-speaking sub-Saharan Africa indicates a critically low physiotherapy workforce density of approximately 1.01 physiotherapists per 100,000 population, with marked disparities between urban and rural areas [41]. Broader workforce assessments similarly identify shortages and maldistribution of rehabilitation professionals across the African region as a major barrier to equitable access to care [42]. Importantly, these statistics represent the general physiotherapy workforce and should not be interpreted as estimates of pelvic health physiotherapist availability. General physiotherapists work across various areas of practice, including orthopedic, musculoskeletal, pediatric, and neurological rehabilitation, whereas pelvic health physiotherapy represents a specialized field within an already constrained workforce. Data specifically describing the availability and distribution of pelvic health physiotherapists across most sub-Saharan African countries remain

limited. Furthermore, formal postgraduate training pathways and recognized specialization programs in pelvic health physiotherapy are not widely established across the region, potentially limiting the development of specialist expertise and the integration of these services into routine healthcare.

The distribution of specialist personnel also reflects broader structural and sectoral inequalities within national healthcare systems. South Africa, where pelvic health physiotherapy is relatively more established than in many other African settings, illustrates this challenge. An empirical survey reported that 75.8% of qualified pelvic health physiotherapists were concentrated in the private healthcare sector [19]. This distribution raises concerns regarding equitable access, particularly among populations dependent on public healthcare services. The same study found that 94.7% of respondents identified a lack of patient-facing resources, while 69.5% reported a need for additional clinician education. These findings highlight that the presence of specialist practitioners does not necessarily translate into equitable service availability. Furthermore, the concentration of specialists within the private sector, coupled with gaps in patient education and professional development, may constrain the broader integration of pelvic health physiotherapy. Evidence regarding specialist workforce distribution, clinical practice, and training opportunities remains particularly limited in many other sub-Saharan African countries, making the extent of these disparities difficult to quantify.

These workforce constraints occur within a broader context of underinvestment in rehabilitation services. The WHO Regional Office for Africa's Rehabilitation Strategy 2025–2035 acknowledges that approximately 210 million people in the African Region require rehabilitation, with at least 63% unable to access the services they need. The strategy also identifies persistent shortages of qualified rehabilitation professionals and inadequate service coverage, particularly at primary healthcare and community levels [42]. To address these challenges, it establishes targets for 60% of member countries to develop national rehabilitation strategic plans supported by dedicated budgets and for 60% of primary healthcare facilities to integrate core rehabilitation services. Nevertheless, concerns have been raised regarding the implementation of these objectives. Npochinto Moumeni [43] highlighted the need for reforms in medical and allied health curricula to strengthen rehabilitation competencies, arguing that limited exposure to rehabilitation during professional training may undermine appropriate referral practices and contribute to the underutilization of rehabilitation services. Such educational limitations may further constrain the development of specialized rehabilitation fields, including pelvic health physiotherapy, by affecting both the availability of trained professionals and the referral pathways required for effective service delivery.

The implications of these workforce limitations are particularly concerning given the substantial burden of pelvic floor disorders among women in low- and middle-income countries (LMICs). Although epidemiological evidence across sub-Saharan Africa remains heterogeneous and incomplete, partly because of variations in diagnostic criteria and limited population-based screening, available studies indicate a considerable burden of pelvic floor conditions, including urinary and fecal incontinence, pelvic organ prolapse, and pelvic girdle pain. A regional systematic review and meta-analysis reported that the prevalence of stress urinary incontinence among women in sub-Saharan Africa may reach 52% [44]. However, the availability of aggregated epidemiological evidence from the region remains limited, as highlighted by another systematic review [45]. This disparity illustrates a fundamental challenge for pelvic health physiotherapy: substantial rehabilitation needs coexist with limited specialist workforce capacity, inequitable service distribution, and insufficient epidemiological evidence to guide service planning. Consequently, women experiencing pelvic health problems may have limited access to the specialized professionals and rehabilitation services required to address their needs.

Evidence-context gap in pelvic health physiotherapy

The generation and dissemination of knowledge in pelvic health physiotherapy represent an important dimension of global inequity within the field. Bibliometric analyses of pelvic floor dysfunction and rehabilitation research indicate that scientific output is predominantly concentrated in high-income countries (HICs), particularly the United States, Australia, the United Kingdom, and Western Europe [46,47]. This geographical concentration of research

production allows institutions in high-resource settings to exert considerable influence over research priorities, clinical guidelines, and standards of care. Recent bibliometric studies similarly identify the United States as a leading contributor to pelvic floor dysfunction research, highlighting the disproportionate influence of a relatively limited number of countries on the evidence base informing international clinical practice.

This imbalance is particularly relevant given the substantial underrepresentation of LMICs in pelvic health research, despite their contribution to a large proportion of the global population [48,49]. Consequently, the conditions and populations receiving research attention may not adequately reflect the epidemiological and clinical realities of resource-constrained settings. Much of the available literature focuses on conditions such as stress urinary incontinence among postmenopausal women, sports-related pelvic girdle pain, and technology-assisted rehabilitation approaches within well-resourced healthcare systems [50]. Although these research priorities address important clinical needs, their predominance may leave other conditions and population-specific rehabilitation challenges insufficiently investigated.

In contrast, pelvic health conditions affecting women in Uganda and other parts of sub-Saharan Africa are frequently shaped by distinct obstetric, socioeconomic, and structural determinants. These include prolonged obstructed labor, OF, multiparity, delayed access to maternal healthcare, physically demanding occupational activities, and persistent socioeconomic vulnerability. Such circumstances may contribute to complex clinical presentations and rehabilitation needs that are insufficiently represented in research conducted predominantly in HICs [51,52]. Consequently, the direct applicability of existing evidence to women in sub-Saharan African settings cannot always be assumed, particularly when differences in disease burden, healthcare access, available resources, and sociocultural circumstances are not adequately considered.

The translation of evidence generated in HICs into LMICs healthcare settings is further complicated by differences in health-system capacity and service-delivery infrastructure. Limited availability of specialized pelvic health physiotherapists, inadequate diagnostic and treatment facilities, restricted opportunities for continuing professional development, variable health literacy, and weak referral pathways between community and tertiary healthcare services may constrain the implementation of established rehabilitation interventions. Accordingly, interventions demonstrated to be effective in well-resourced settings may encounter challenges in terms of implementation fidelity, accessibility, and long-term sustainability when introduced into resource-constrained environments. These limitations extend beyond the availability of equipment or personnel and reflect differences in the clinical, institutional, and sociocultural contexts within which rehabilitation is delivered.

Although evidence-based practice remains the cornerstone of physiotherapy decision-making, clinicians working in LMICs often have limited capacity to critically evaluate whether existing evidence originates from populations, health systems, and sociocultural contexts comparable to those of their patients [48,51]. Consequently, pelvic health physiotherapy in many LMICs continues to depend on clinical frameworks derived from populations that are systematically underrepresented in the evidence itself. This represents a form of epistemic inequity in which those bearing a substantial proportion of the global burden of pelvic floor disorders contribute minimally to the production of the knowledge used to guide their care. Such inequities highlight the urgent need for contextually relevant research, locally generated evidence, and implementation frameworks that are responsive to the realities of rehabilitation practice in sub-Saharan Africa.

Digital health for pelvic health rehabilitation

Digital health and telehealth offer potential opportunities to expand access to rehabilitation services, particularly for populations living in geographically underserved areas. However, their implementation in low-resource settings remains constrained by substantial infrastructural, economic, and sociocultural barriers. Much of the evidence supporting telehealth implementation has emerged from healthcare systems with comparatively well-developed digital infrastructure, including more reliable electricity, internet connectivity, and access to internet-enabled devices. In contrast, healthcare systems across many parts of sub-Saharan Africa operate

within technological environments characterized by intermittent electricity, unstable internet connectivity, and limited broadband coverage, particularly outside urban centers. These constraints may compromise the feasibility, continuity, and quality of remote rehabilitation delivery, especially for interventions requiring real-time communication, video consultations, or application-based monitoring [53,54].

Affordability represents an additional barrier to equitable digital health adoption. Although mobile phone ownership has increased substantially across Africa, access to internet-enabled smartphones and the financial burden associated with purchasing cellular data continue to restrict participation in digital health programs among socially and economically disadvantaged populations. Consequently, digital innovations that assume consistent smartphone ownership and unrestricted internet access risk exacerbating existing healthcare inequities by disproportionately benefiting individuals who are already relatively advantaged [53,55].

Digital and health literacy also influence the accessibility and effectiveness of remote rehabilitation interventions. Engagement with telehealth platforms frequently requires users to navigate digital applications, interpret health information, follow therapeutic instructions, and independently monitor symptoms or exercise adherence. Where digital literacy and educational backgrounds vary considerably, poorly adapted interfaces and complex instructions may limit patient engagement and sustained participation. The implementation of digital pelvic health interventions should therefore account for differences in educational attainment, technological familiarity, and health literacy rather than assuming that access to digital devices necessarily translates into the capacity to use them effectively [56,57].

Linguistic and sociocultural considerations present additional challenges. Many digital health resources, educational materials, and self-management applications are developed primarily in English and may incorporate assumptions about health beliefs, communication practices, and healthcare-seeking behaviors that do not necessarily reflect the experiences of women in sub-Saharan Africa. Their direct adoption without appropriate adaptation may compromise comprehension, cultural relevance, and acceptability. Effective implementation therefore requires the development or adaptation of educational content in locally appropriate languages, incorporating culturally meaningful terminology and locally understood expressions of symptoms and health concerns. Such adaptation is particularly important in pelvic health rehabilitation, where discussions of continence, reproductive health, and sexuality may be influenced by cultural sensitivities and social stigma [53].

Taken together, these considerations suggest that digital health solutions for pelvic health physiotherapy in low-resource settings cannot simply be imported from high-income healthcare systems and expected to function effectively. Rather, they must be designed around the realities of local health systems and patient circumstances. Approaches incorporating low-bandwidth communication channels, short message service (SMS)-based support, community health worker facilitation, offline functionality, and culturally adapted educational content may offer more feasible and equitable pathways for extending pelvic health services to underserved populations. Such context-responsive innovations have the potential to narrow existing access gaps while avoiding the creation of new forms of digital exclusion, thereby supporting more equitable rehabilitation outcomes across resource-constrained settings [53,56].

Sexuality as a persistent blind spot

Despite advances in pelvic health physiotherapy, sexuality remains one of the most under-addressed dimensions of rehabilitation practice. Historically, pelvic health services have prioritized symptom reduction, continence restoration, and functional recovery, while sexual health has often been treated as a secondary or optional outcome. This omission persists across both high- and low-income settings but is particularly pronounced in sub-Saharan Africa, where cultural taboos, religious norms, sex-based expectations, and institutional discomfort frequently limit discussions about sexuality within healthcare encounters. As a result, women may complete rehabilitation programs with significant unresolved concerns related to intimacy, sexual function, body image, and partner relationships.

The marginalization of sexual health within rehabilitation is inconsistent with contemporary understandings of health and well-being. The World Health Organization (WHO) defines sexual

health as a state of physical, emotional, mental, and social well-being in relation to sexuality, rather than merely the absence of disease or dysfunction [58]. This definition emphasizes that positive and respectful sexual experiences are fundamental components of overall health and quality of life. Within this framework, rehabilitation that restores continence or mobility while neglecting sexual well-being cannot be considered fully comprehensive or patient-centered.

The importance of addressing sexuality is further supported by growing evidence demonstrating the close relationship between pelvic floor function and female sexual health. Pelvic floor muscles contribute to genital support, vaginal tone, neuromuscular coordination, and sexual response. Dysfunction of these structures has been associated with impairments in arousal, orgasm, sexual satisfaction, and the experience of sexual pain. Recent systematic reviews and meta-analyses have shown that pelvic floor muscle training can significantly improve female sexual function and represents an effective conservative intervention for women experiencing sexual dysfunction associated with pelvic floor disorders [1,59]. Contemporary reviews similarly highlight the central role of pelvic floor rehabilitation in addressing multiple domains of female sexual function and overall quality of life [60].

The neglect of sexual health is particularly consequential for women recovering from OF and other childbirth-related pelvic floor injuries. Evidence from East Africa demonstrates that successful fistula closure does not automatically restore sexual well-being, confidence, or relationship functioning. Women frequently report fears of recurrence, anxiety surrounding the resumption of sexual activity, uncertainty about future pregnancy, concerns regarding fertility, and diminished confidence in their bodies despite successful surgical outcomes [34,61]. These experiences are often compounded by stigma, social exclusion, marital instability, and psychological distress that extend far beyond the resolution of physical symptoms [62,63]. Therefore, rehabilitation programs that focus primarily on anatomical healing risk overlooking critical aspects of women's recovery and reintegration into family and community life.

Integrating sexual health into pelvic health physiotherapy requires practical and culturally responsive implementation strategies rather than specialized services that may be unavailable in most low-resource settings. One important step is the routine incorporation of brief sexual health screening questions into standard clinical assessments. When clinicians consistently ask about pain during intercourse, fears related to intimacy, relationship concerns, and confidence in resuming sexual activity, sexual health becomes normalized as a legitimate component of rehabilitation rather than an exceptional topic discussed only when initiated by the patient.

Structured education and counseling should also be embedded throughout the rehabilitation pathway. Women recovering from pelvic floor disorders frequently require guidance regarding tissue healing, expected recovery trajectories, safe resumption of sexual activity, symptom monitoring, and reproductive health planning. Providing clear and evidence-informed information may reduce fear, enhance self-efficacy, and support informed decision-making during recovery. This need is particularly evident among obstetric fistula survivors, for whom sexual recovery is often intertwined with concerns regarding fertility, relationships, social identity, and fears of recurrent injury [58,61].

Routine outcome assessment is another essential component of comprehensive care. While extensive sexual function questionnaires may not always be feasible in resource-constrained settings, simplified patient-reported outcome measures evaluating sexual comfort, confidence, fear of intimacy, and perceived readiness to resume sexual activity can provide meaningful indicators of recovery. Such measures help ensure that improvements in continence or physical function are not mistakenly interpreted as complete rehabilitation when significant psychosocial or sexual concerns remain unresolved.

Addressing sexual health also requires collaboration across disciplines. Because sexual dysfunction frequently involves physical, psychological, relational, and sociocultural dimensions, physiotherapists should operate within referral networks that include nurses, counselors, psychologists, social workers, and community health workers where available. Multidisciplinary approaches are particularly important for women experiencing trauma-related distress, relationship difficulties, stigma, or challenges with social reintegration following obstetric injury [34,62].

Finally, successful implementation depends on clinicians' ability to communicate about sexuality in ways that are culturally respectful, private, and patient-centered. Discussions should be framed as routine components of pelvic functional recovery rather than as personal or morally sensitive matters. By positioning sexual health within a broader conversation about well-being, comfort, relationships, and quality of life, clinicians can improve acceptability while maintaining sensitivity to local cultural norms. Without these intentional approaches, rehabilitation programs risk achieving physical healing while leaving women to navigate the complex realities of sexual recovery, intimate relationships, and psychosocial reintegration largely on their own. Recognizing sexual health as a fundamental component of pelvic health physiotherapy is therefore essential for delivering truly holistic, woman-centered rehabilitation services.

Rehabilitation beyond hospital discharge: Establishing a continuum of care

The discontinuation of rehabilitation following hospital discharge represents a major manifestation of fragmentation in pelvic health physiotherapy provision, particularly in LMICs. Recovery from complex pelvic floor dysfunctions, childbirth-related injuries, and reconstructive procedures such as OF repair extends far beyond the inpatient period. Functional recovery involves not only tissue healing but also the restoration of continence, mobility/ambulation, social participation, sexual well-being, mental health, and economic productivity, all of which evolve over months or even years following discharge. Evidence from Uganda demonstrates that women's physical and psychosocial recovery trajectories continue well beyond surgical repair, highlighting the limitations of models that concentrate rehabilitation exclusively within hospital settings [34].

For many women, discharge occurs long before rehabilitation goals have been achieved. Sustained pelvic floor muscle training, behavioral modification, progressive return to activities of daily living, reintegration into intimate relationships, and management of psychological distress often remain unresolved at the time women leave healthcare facilities. Studies among fistula survivors consistently demonstrate that successful surgical closure does not necessarily restore social participation, self-confidence, emotional well-being, or quality of life, highlighting the need for ongoing rehabilitation support after discharge [62,63]. Therefore, hospital-based physiotherapy protocols that operate within short inpatient timelines are unlikely to address the full spectrum of recovery needs experienced by women living with pelvic floor disorders associated with OF.

Recognizing rehabilitation as a continuum rather than a discrete episode of care necessitates the development of community-based rehabilitation models that connect specialist services with existing primary healthcare and community support structures. Such an approach is consistent with the principles of community-based rehabilitation advocated by the WHO, which emphasizes long-term participation, functionality, inclusion, and community engagement as central objectives of rehabilitation services. Within such a model, specialist physiotherapists would maintain responsibility for comprehensive assessment, individualized rehabilitation planning, and management of complex cases. Their role would extend beyond direct patient care to include mentorship, training, and supportive supervision of frontline healthcare workers. Initial assessments should establish individualized rehabilitation goals, prescribe progressive home-based exercise programs, identify potential risks to recovery, and determine clear criteria for follow-up and referral.

Nurses and midwives would function as the critical bridge between hospital and community care. Given their accessibility within primary healthcare systems, these professionals are well positioned to reinforce rehabilitation education before discharge, monitor postoperative recovery, assess adherence to prescribed exercises, evaluate symptom progression, and identify early warning signs requiring specialist review [64]. Integrating rehabilitation principles into routine maternal and reproductive health services may also facilitate continuity of care for women who would otherwise have limited contact with physiotherapy services.

Community health workers and Village Health Teams could provide the essential longitudinal support required to sustain recovery. Through structured task-sharing approaches,

community-based personnel may reinforce prescribed home exercise programs, monitor functional progress, encourage adherence to behavioral recommendations, provide basic health education, and facilitate referrals when concerns arise. The effectiveness of community-based rehabilitation programs in improving participation and access to care has been widely documented across disability and rehabilitation contexts, particularly where shortages of rehabilitation professionals limit service availability [65].

However, task-sharing alone is insufficient without investment in workforce development and clinical governance. Community-based cadres require standardized training in basic pelvic health concepts, recognition of complications, communication skills, and rehabilitation monitoring. This training should be supported by ongoing supervision from physiotherapists through periodic outreach visits, scheduled case reviews, structured referral clinics, or mobile-health communication platforms. Regular supervisory contact not only improves service quality but also strengthens confidence among frontline workers responsible for delivering community-based support.

A functional continuum of care additionally requires clearly defined referral pathways. Women presenting with recurrent urinary or fecal incontinence, severe pelvic pain, symptoms suggestive of fistula recurrence, wound complications, significant prolapse symptoms, or marked psychological distress should be rapidly escalated for specialist evaluation. Establishing explicit referral thresholds reduces delays in treatment and ensures that community-based follow-up complements rather than replaces specialist services.

Equally important is the introduction of structured follow-up schedules that extend beyond discharge. Rather than ending rehabilitation abruptly upon hospital departure, services could incorporate standardized follow-up reviews at approximately six weeks, three months, six months, and one year after treatment. These contacts would provide opportunities to evaluate continence outcomes, pelvic floor muscle function, physical activity participation, return to work, psychosocial adjustment, and sexual well-being. Such longitudinal monitoring acknowledges that rehabilitation success cannot be adequately evaluated during the immediate postoperative period alone.

Ultimately, achieving continuity of pelvic health rehabilitation will require institutional commitment to workforce training, supportive supervision, referral infrastructure, and community engagement. Without these systems, healthcare services risk focusing exclusively on acute treatment while neglecting the prolonged recovery period during which many women face their greatest functional, psychological, and social challenges. A continuum-of-care approach therefore represents not merely a service expansion but a fundamental shift from episodic treatment toward sustained, person-centered rehabilitation capable of supporting meaningful recovery and reintegration into community life.

Toward an Africa-specific framework for integrated pelvic health rehabilitation

The preceding analysis identifies several interrelated principles for establishing a more integrated, equitable, and effective model of pelvic health physiotherapy in obstetric fistula care across sub-Saharan Africa. Grounded in the available evidence and practical experiences from settings such as Uganda, these principles inform a context-responsive conceptual framework that addresses the structural and clinical dimensions of service fragmentation (**Figure 1**).

The proposed framework brings together several interconnected components, including comprehensive assessment and individualized interventions, integration of the biopsychosocial model, continuity of care beyond hospital discharge, incorporation of sexual health, long-term functional outcome monitoring, workforce development through task-sharing and specialist supervision, health-system coordination, and context-specific evidence generation. Collectively, these components provide a conceptual basis for strengthening accessible, equitable, and sustainable pelvic health rehabilitation across diverse healthcare settings in sub-Saharan Africa.

Rehabilitation must extend beyond the hospital discharge

Hospital-based physiotherapy should generally be conceptualized as an initiation of the rehabilitation continuum and not its entirety. Planning discharge should include a structured home exercise program to empower the patients to take charge of their recovery journey, community health worker-facilitated follow-up and, where feasible, a mobile or community

clinic-based review at defined intervals post-discharge. Protocols should adapt or utilize outcome measures that are assessable in community settings and not only those requiring hospital equipment.

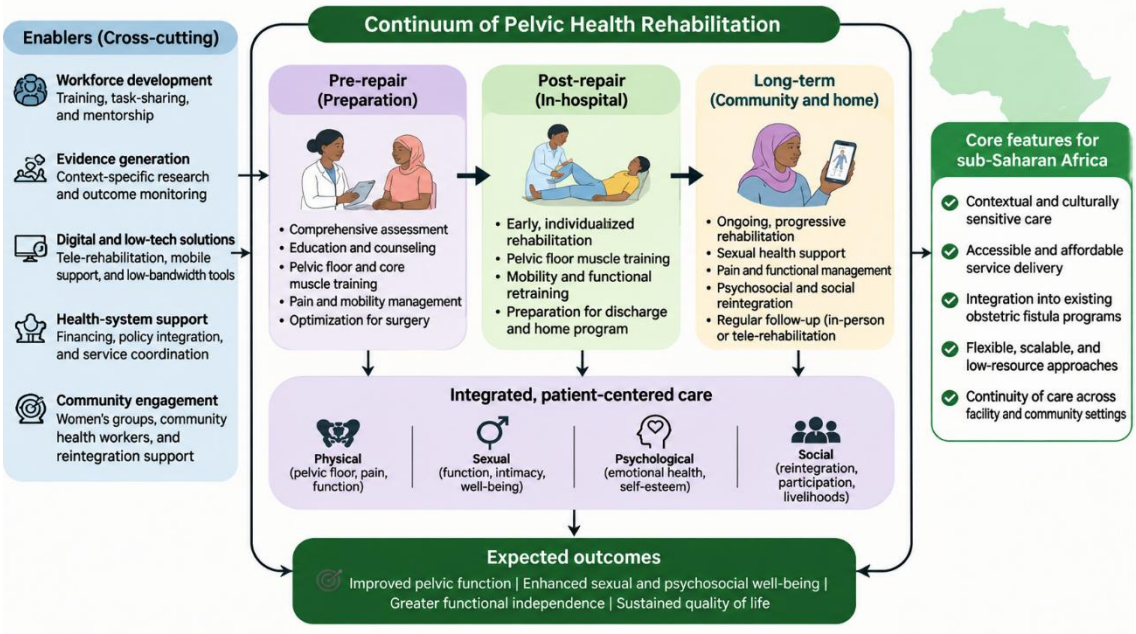


Figure 1. Proposed conceptual framework for integrated pelvic health rehabilitation in obstetric fistula care across sub-Saharan Africa. The framework illustrates the interconnected roles of comprehensive assessment, individualized interventions, continuity of care, sexual health integration, workforce development, health-system coordination, and context-specific evidence generation in strengthening rehabilitation services.

Sexual health must be integrated into pelvic health rehabilitation

Any pelvic health protocol that does not address sexual function is, at its best, incomplete. Clinical training, outcome measures, and intervention protocols should explicitly incorporate sexual health components. This requires a combination of both technical training in the management of concerns of sexuality and communication training to enable healthcare providers to raise sexual health as a topic of discussion with patients in a way that is culturally appropriate and non-stigmatizing.

The biopsychosocial model must be operationalized

Pelvic floor dysfunction cannot be adequately understood as an isolated biomechanical impairment requiring a purely mechanical intervention. While abnormalities in pelvic floor muscle strength, endurance, coordination, and tissue integrity undoubtedly contribute to symptoms, the lived experience of pelvic floor dysfunction extends far beyond the physical pathology itself. Women frequently experience anxiety regarding leakage episodes, fear of movement or reinjury, sexual insecurity, diminished self-esteem, social withdrawal, relationship strain, and reduced participation in productive and community activities. Therefore, management approaches that focus exclusively on anatomical and functional impairments risk overlooking key determinants of recovery and long-term rehabilitation outcomes [66,67].

The biopsychosocial model provides a useful framework for addressing this complexity by recognizing that biological, psychological, and social factors interact continuously to influence health status, disability, and rehabilitation outcomes. Within pelvic health physiotherapy, operationalizing this model requires systematic assessment and consideration of all three domains throughout the rehabilitation process rather than prioritizing physical recovery alone [66].

At the biological level, assessment focuses on factors directly related to pelvic floor structure and function. These include pelvic floor muscle strength, endurance, tone, coordination, bladder and bowel function, pain mechanisms, and the integrity of affected tissues. In women recovering

from obstetric trauma, additional considerations may include scarring, vaginal stenosis, neuromuscular injury, and persistent pain symptoms. Clinical evaluation commonly incorporates digital vaginal examination using standardized assessment systems such as the Modified Oxford Scale, bladder and bowel diaries, symptom severity questionnaires, and, where available, adjunctive technologies such as biofeedback or surface electromyography. Findings from these assessments inform individualized interventions including pelvic floor muscle training, bladder retraining, behavioral modification, pain management strategies, and manual therapy approaches where clinically indicated. Evidence consistently demonstrates pelvic floor muscle training as a first-line intervention for many pelvic floor disorders and an important contributor to functional recovery [68,69].

However, biological recovery alone does not necessarily translate into functional improvement. Psychological factors frequently influence symptom perception, treatment adherence, and participation in rehabilitation. Women may experience anxiety regarding recurrent incontinence, fears of surgical failure, depression related to altered body image, or avoidance of physical activity because of concerns about symptom exacerbation. Such concerns can persist even when objective improvements in pelvic floor function have occurred. Therefore, routine psychological screening should form part of comprehensive pelvic health assessment. Validated instruments such as the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) provide practical opportunities to identify psychological distress and facilitate timely referral when necessary. Within physiotherapy practice, psychological considerations may be addressed through patient education, graded exposure approaches, self-management support, pain neuroscience education, confidence-building strategies, and collaboration with mental health professionals when required [70,71].

Equally important are the social and cultural factors that influence rehabilitation outcomes. Pelvic floor disorders do not occur in isolation from the environments in which women live and function. Relationship dynamics, family expectations, sexual relationships, occupational demands, social support, stigma, and economic stability all contribute to the success or failure of rehabilitation efforts. For women in sub-Saharan Africa, recovery often occurs within contexts characterized by physically demanding agricultural work, caregiving responsibilities, limited healthcare access, and substantial stigma surrounding reproductive health conditions. Assessment therefore requires clinicians to understand the broader context within which recovery takes place. Semi-structured interviews exploring social support, household responsibilities, occupational demands, intimate partner relationships, and barriers to treatment adherence may reveal challenges that would otherwise remain invisible during physical examination alone. These findings may subsequently inform exercise prescription, activity modification, counseling strategies, and referral to community support systems [34,67].

When these biological, psychological, and social domains are considered simultaneously, rehabilitation shifts from symptom management to meaningful functional recovery. For example, a woman presenting with pelvic floor weakness after OF repair may clinically require pelvic floor muscle training. However, optimal recovery may also require addressing her fear of recurrence, rebuilding confidence regarding sexual activity, supporting her return to household and agricultural responsibilities, and facilitating access to social support networks. In such cases, successful rehabilitation is measured not solely by improvements in pelvic floor muscle strength but also by the restoration of participation, independence, confidence, and quality of life.

Ultimately, a biopsychosocial approach redefines rehabilitation success beyond the confines of the clinic. Outcomes should encompass a woman's ability to resume productive work, maintain social relationships, participate confidently in intimate partnerships, manage her condition independently, and sustain these gains over time. Such an approach aligns with contemporary rehabilitation frameworks, including the International Classification of Functioning, Disability and Health (ICF), which emphasizes participation and lived functioning as the ultimate goals of rehabilitation rather than mere correction of physiological impairment [67]. By embedding these principles into pelvic health physiotherapy, clinicians can move beyond fragmented impairment-based care toward genuinely person-centered rehabilitation.

Long-term functional rehabilitation must be a clinical goal

Rehabilitation outcomes should extend beyond the assessment of continence and pelvic floor muscle strength to include broader indicators of functional recovery. These may encompass return to work, resumption of sexual activity when clinically appropriate and desired, participation in domestic and community activities, psychosocial well-being, and self-reported quality of life. Assessments should extend beyond hospital discharge, with longitudinal monitoring ideally continuing for at least 12 months where resources and follow-up arrangements permit. Such an approach would provide a more comprehensive understanding of recovery trajectories and help identify persistent functional limitations that may not be apparent during the immediate postoperative period. Outcome frameworks restricted to hospital discharge may therefore be insufficient to evaluate long-term rehabilitation needs and inform service development and health policy.

Context-specific evidence must be generated

The global evidence base informing pelvic health physiotherapy should be expanded to incorporate research conducted in LMICs, particularly studies involving populations and healthcare settings that remain underrepresented in international literature. Strengthening this evidence base requires investment in research infrastructure, institutional research capacity, and opportunities for African researchers to lead and disseminate locally relevant investigations. It also requires greater recognition of the value of evidence generated through implementation science, qualitative research, and community-based participatory approaches alongside randomized controlled trials. These methodologies can provide complementary insights into intervention effectiveness, cultural acceptability, implementation barriers, and the practical conditions required for sustainable rehabilitation delivery in resource-constrained settings. Locally generated evidence is therefore essential to ensure that rehabilitation priorities and clinical recommendations reflect the needs and circumstances of the populations they are intended to serve.

Workforce development must target all levels of the health system

In settings where specialist pelvic health physiotherapists remain scarce, task-sharing and task-shifting may provide pragmatic strategies for expanding access to essential rehabilitation services. Nurses, midwives, and community health workers can be trained to deliver selected low-risk interventions, including pelvic floor health education, continence promotion, adherence monitoring, basic supervised pelvic floor muscle exercises, and identification of common symptoms requiring referral. However, such approaches should operate within clearly defined implementation frameworks that specify competency-based training requirements, ongoing supervision by appropriately qualified physiotherapists, and standardized referral pathways.

Women presenting with red-flag symptoms, complex pelvic floor dysfunction, persistent symptoms, neurological conditions, severe pain, recurrent fistula-related complications, or inadequate response to initial interventions should be referred for specialist assessment. Similarly, contraindications to delegated activities and mechanisms for clinical escalation must be explicitly established to safeguard patient safety and quality of care. Task-sharing should therefore complement rather than replace specialist pelvic health physiotherapy, extending the reach of limited specialist expertise into communities while preserving access to higher levels of clinical care when necessary.

Taken together, these principles emphasize that strengthening pelvic health physiotherapy in OF care requires more than increasing the availability of individual interventions. It necessitates coordinated changes in clinical practice, workforce capacity, research priorities, and healthcare organization. An integrated, context-responsive approach that connects specialist expertise with primary healthcare and community-based support may provide a practical foundation for improving continuity, equity, and long-term rehabilitation outcomes across sub-Saharan Africa.

Conclusion

Pelvic health physiotherapy provision across sub-Saharan Africa remains constrained by multidimensional fragmentation involving geographical and resource-related inequalities, limited workforce capacity, insufficient integration of sexual health, and inadequate continuity of rehabilitation beyond hospital-based care. The available evidence also highlights a substantial gap between internationally generated rehabilitation knowledge and the clinical, socioeconomic, and health-system realities of African populations. These challenges indicate that addressing OF requires a rehabilitation approach extending beyond anatomical repair and immediate postoperative recovery.

Strengthening pelvic health physiotherapy requires a transition from fragmented, hospital-centered services toward integrated, equitable, and context-responsive rehabilitation pathways. This approach should incorporate comprehensive biopsychosocial assessment, individualized interventions, sexual health integration, continuity of care through community-based services, and long-term functional outcome monitoring. Achieving these objectives will depend on coordinated workforce development, appropriate task-sharing and specialist supervision, stronger primary healthcare integration, and investment in locally generated evidence.

Ultimately, an Africa-specific approach to pelvic health rehabilitation should prioritize not only anatomical and functional recovery but also sexual well-being, psychosocial health, independence, and sustained social participation. Embedding these priorities within maternal and reproductive healthcare systems is essential to establishing accessible, comprehensive, and sustainable rehabilitation services for women affected by OF across sub-Saharan Africa.

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Underlying data

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Declaration of artificial intelligence use

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