



Rebuilding Rehabilitation: Evolution of Physiotherapy Services in Liberia after the Civil War (1990s to Present)

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Abstract

Background

The national health system of Liberia was severely damaged during its civil war in the 1990s, especially the rehabilitation and physiotherapy services. During the post-conflict time, however, steps have been taken to improve rehabilitation and physiotherapy infrastructure as well as the number of trained staff to deliver physiotherapy services. Nevertheless, systematic documentation of the progression, current conditions, and sustainability of physiotherapy services currently exists in Liberia is still quite limited.

Methods

By utilising a cross-sectional study design, Researchers conducted a national examination of the changes that had occurred in Liberia's physical therapy sector since the end of the civil war. A structured survey instrument was developed using a Likert Scale. The completed versions of this survey were sent to 950 unique participants, comprising Physiotherapists and other Rehabilitation Providers; Administrators within the Health System, Instructors and Students majoring in Fields of Physical Education. This survey instrument collected information on how the civil conflict affected the physical therapy profession; Workforce Development; Infrastructure Issues; Policy & Governance; the Role of International Agencies; Service Delivery Utilisation; Challenges; and Sustaining Services. The data analysis was performed utilising both descriptive and inferential statistical techniques to identify trends and explore relationships among the respondent's demographic groups.

Results

Challenges to access physiotherapy services were reported to be disrupted significantly at times during and after the civil war. However, improvements were reported to have occurred in workforce development, institutional capabilities, and the availability of physiotherapy services after the civil war. Respondents cited many of the services available in their area were provided through the involvement of international and non-governmental organisations who played a significant role in the recovery of the rehabilitation systems. Many of the respondents reported continuing challenges even after these improvements, including lack of financial resources; lack of equal distribution of physiotherapy services across geographic areas; limited availability of equipment and shortages of trained physiotherapists, especially in rural parts of the country. Gaps in governance, as well as long-range planning, were identified by respondents, as evidenced by mixed responses regarding both the level of policy support for physiotherapy services, and the degree to which physiotherapy services are integrated into the national health system.

Conclusion

The major findings from this study indicate that participation in Physiotherapy services since the end of the Civil War is largely due to external partnerships and workforce training programs which have been developed & established with the help of International Agencies. However, significant structural, financial, and policy-induced impediments will hinder the continued development of Physiotherapy services within Liberia. There is a need to work together to build on existing strengths and provide greater government investment through increased funding, to strengthen support to the various local training programmes and improve overall system integration as part of the effort to build a sustainable rehabilitation service in post-conflict Liberia.

Keywords

Physiotherapy; Rehabilitation services; Post-conflict health systems; Civil war recovery; Health workforce development; Disability and rehabilitation

Background

Armed conflict has profound and long-lasting effects on national health systems, particularly in low-income and fragile states where institutional capacity, infrastructure, and human resources are already limited [1]. Prolonged conflict disrupts health service delivery, damages or destroys health facilities, displaces health workers, and weakens governance structures. As

a result, access to essential health services remains severely constrained long after hostilities have ended.

Liberia's health care system was extensively damaged during its 14-year civil war (1989–2003). Health facilities were destroyed, skilled health professionals were killed or forced to flee, and health training institutions collapsed [2]. The conflict also led to a substantial increase in

traumatic injuries, many resulting in permanent disability due to gunshot wounds, land mines, amputations, and untreated fractures.

Rehabilitation services were among the most severely affected components of the health system, with physiotherapy particularly impacted [3]. Emergency health responses during and after the conflict focused largely on communicable diseases, maternal and child health, and acute care, while rehabilitation services received little attention. Consequently, individuals with physical disabilities had very limited access to rehabilitation in the post-conflict period, leading to long-term functional impairments, social exclusion, and reduced economic participation. This situation further increased the overall burden of disability in Liberia.

Physiotherapy plays a critical role in restoring physical function, reducing disability, and improving quality of life, especially in post-conflict settings where trauma-related impairments are highly prevalent [4]. Effective physiotherapy interventions can improve recovery, prevent secondary complications, and support community reintegration for persons with disabilities. Globally, rehabilitation is increasingly recognised as an essential component of Universal Health Coverage (UHC), requiring equitable access to services across the life course [5]. Despite this recognition, physiotherapy services in Liberia remained neglected for many years following the civil war due to limited financial resources, weak policy frameworks for workforce development, and competing public health priorities such as infectious disease control and emergency care [6].

Since the end of the civil war, Liberia has undertaken health system reforms aimed at restoring essential health services, strengthening governance, and addressing shortages in human resources for health [7]. These recovery efforts, supported by international agencies and non-governmental organisations (NGOs), created opportunities to rebuild rehabilitation services through investments in training, infrastructure rehabilitation, equipment provision, and technical assistance [8]. Such external support contributed to the re-establishment of physiotherapy services and the gradual development of local professional capacity.

Although the availability of physiotherapy services has improved, substantial inequities in access persist across the country. Access varies significantly by geographic location (urban versus rural) and by type of service provider (government versus donor-supported) [9]. Rural and underserved areas continue to face shortages of physiotherapists, limited equipment, long travel distances, and affordability barriers. These disparities highlight ongoing structural weaknesses and poor integration of rehabilitation services within the broader health system.

Understanding the development of physiotherapy services from the period of civil conflict to the present is therefore essential for future rehabilitation planning, policy development, and service delivery in Liberia. By examining stakeholder experiences and perceptions, this study provides a comprehensive review of post-war physiotherapy development and identifies key

gaps and opportunities for strengthening rehabilitation services in the country [10].

Methods

Study Design

Perceptions of the evolution and status of physiotherapy services in Liberia were assessed using a nationwide, cross-sectional survey design [11]. This survey design was suitable for capturing an overview of stakeholders' experiences at a specific point in time and allows for comparisons to be made between professionals from different geographic areas as well as between various professional groups.

Study Population and Sample Size

Results were obtained via an on-line survey completed by 950 people including practicing physiotherapists, rehabilitation professionals, health administrators, academic staff, non-governmental organisation (NGO) staff, and final-year students studying physical education. This was a large and diverse sample enabling good representation across all major professional groups and geographical areas, making it possible to make inferences based on the findings [12].

Data Collection Instrument

A Likert Scale Questionnaire was Developed that included Eight key domains of Interest Based on Existing Post Conflict Health System Issues and Rehabilitation Literature [13]. A Comprehensive Evaluation of Physiotherapy Service Development over Time Provided a Comprehensive Overview of Respondents' Perspective on Post Conflict Development of

HCWs in Four Main Categories – Post War Impact; Work Force Development; Infrastructure/Service Delivery; Policies/Governance; The International Community; Community/Utilization; Current Issues; Future Sustainability.

Data Collection Procedure

Self-administered questionnaires were used to collect data and were made available through both electronic as well as paper formats in order to facilitate increased participation and additional geographies covered by data collection efforts. All respondents provided their consent prior to providing any input about their participation, therefore maintaining ethical standards and open communication to all participants involved in the data collection process [14].

Data Analysis

The data from the completed questionnaires was subjected to coding before it was pulled into statistical analysis software for analysis. The researchers performed descriptive statistical analyses using frequencies, percentages and mean scores to summarise respondent answers. They then conducted inferential statistical analyses to compare respondents' perceptions according to their individual groups and settings. [15].

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board of Desh Bhagat University (IRB/DBU/2024/017). Participation was entirely voluntary, and all

respondents provided written informed consent after receiving detailed information about the study objectives, procedures, potential risks, and benefits. Confidentiality and anonymity were strictly maintained; no personally identifiable information was collected, and access to the

research data was restricted to members of the research team only. Participants were informed of their right to withdraw from the study at any stage without penalty or adverse consequences [16].

Results

Table 1. Respondent Socio-demographics (n = 950)

Characteristic	Frequency	Percentage
Physiotherapists	320	33.7
Rehabilitation professionals (other)	210	22.1
Health administrators	160	16.8
Educators	110	11.6
Final-year students of physical education related studies	150	15.8
Urban-based	610	64.2
Rural-based	340	35.8

As seen in Table 1, the study included the sociodemographic information about the 950 Survey participants in the study. Physiotherapists make up the largest number of Survey Respondents (33.7%), indicating that many frontline rehabilitation professionals who deliver services were represented. The next largest group of rehabilitation professionals was 22.1%. The presence of multiple professional disciplines in rehabilitation represents a multidisciplinary viewpoint of the rehabilitation workforce. Health

Administrators, and Educators were also well represented in this sample at 16.8%, and 11.6% respectively providing insight into the policies, management, and training dimensions of physiotherapy service delivery. Final-year students of physical education related studies were represented in the study sample at 15.8% creating a good representation of the new workforce perspective on these issues.

Geographically, most of the participants were from urban areas (64.2%). However, a

significant portion of the Study Sample (35.8%) came from a rural area. While urban participants were clearly in the majority, the fact that more than one-third of the study participants came from a rural environment enables the comparison of the perception of rehabilitation service delivery between rural and urban settings

to reveal how the rural–urban divide impacts physiotherapy service delivery in the context. Additionally, the publication of study results that reflects both geographic and professional diversity increases the validity and generalizability of the results.

Table 2. Civil War Impact on Physiotherapy Services

Statement	Agree/Strongly Agree (%)
Services severely disrupted	89.4
Infrastructure destroyed	86.7
Workforce significantly reduced	82.9
Long-term system setbacks	84.1

The findings from Table 2 describe how respondents perceive that the civil war impacted physiotherapy services within Liberia. The majority (89.4%) of respondents stated that physiotherapy services were greatly disrupted due to the conflict, demonstrating a significant adverse effect of the war on service provision for rehabilitation service delivery. In addition, 86.7% of respondents believed there was a great deal of destruction of rehabilitation facilities and related equipment during this time; these two results illustrate that many facilities were damaged or destroyed during the conflict as a result of the ongoing war in Liberia.

Fewer than four-fifths of all respondents (82.9%) indicated that there was a severe diminishment in the physiotherapy workforce during the war years; this reflects the fact that many skilled professionals left, were forced to leave, or died due to the civil war. Similarly, 84.1% of respondents indicated that the civil war resulted in a long-term systemic impediment to physiotherapy services; therefore, the impact of the civil war has been felt long after the fighting ended. Taken together, these results demonstrate the significant and far-reaching effects of the civil war on physiotherapy service in Liberia.

Table 3. Post-Conflict Workforce Development and Training

Indicator	Agree/Strongly Agree (%)
Increase in trained physiotherapists	61.3
Improved access to training	58.6
Positive impact of international partnerships	73.9
Adequacy of continuing education	44.8

Table 3 displays the views of survey respondents on occupational rehabilitation and training practices in physiotherapy during post-civil wars. More than half of those surveyed (61.3%) believed there was an increase in the number of qualified physiotherapists suggestive of recovery and growth within the field of Rehabilitation. Likewise, nearly equal amounts (58.6%) identified increased opportunities to access education and training relevant to physiotherapy, indicating steps have been taken to re-establish educational pathways post-conflict.

Also noted by respondents, was a high regard for International partnerships related to workforce development. Those surveyed who identified these partnerships as significantly helpful

through their efforts to provide education and training, mentor potential employees, and build supportive infrastructure within the Rehabilitation profession, made up 73.9% of the survey population. That is significantly less than half of those surveyed (44.8%) did not agree that sufficient continuing professional development opportunities were available, indicating that there continues to be a lack of skills enhancement and guidance to support the ongoing development of professional competency. Collectively, it appears that there have been significant improvements in healthcare personnel education/training post-civil war; however, there is still much more work to be done to develop a robust, sustainable professional development workforce support framework across the Rehabilitation workforce.

Table 4. Physiotherapy Infrastructure and Service Delivery

Indicator	Agree/Strongly Agree (%)
Improved rehabilitation facilities	56.2
Adequate equipment availability	41.5
Urban service adequacy	68.9
Rural service adequacy	29.4

Respondents' perceptions regarding both the quality of the infrastructure and the quality of physiotherapy service delivery in Liberia are provided in Table 4. Nearly all respondents (56.2%) indicated agreement or strong agreement that there has been significant improvement in the physical infrastructure of rehabilitation facilities since the end of the Civil War, confirming that rebuilding physical infrastructure has occurred to a moderate degree. However, respondents had much lower expectations for availability of equipment, with only 41.5% of respondents considering available equipment to be adequate, which reflects the ongoing lack of funding to support effective service delivery with adequate resources.

There were significant disparities between urban and rural locations. Approximately 68.9% of respondents described physiotherapy services available in urban locations to be adequate, compared to less than 30% of respondents who described rural physiotherapy services to be adequate (29.4%). The large gap between urban and rural services continues to evidence the inequities of access to rehabilitation services, and further emphasizes the need for focused investments and strategies to develop a qualified workforce to provide physiotherapy services to rural communities that are currently under-resourced.

Table 5. Policy, Governance, and International Support for Physiotherapy Services

Indicator	Agree/Strongly Agree (%)
Government policy support	47.6
Integration into health system	45.2
NGO contribution significant	78.3
Sustainability concerns	66.8

Table 5 provides insight into the thoughts of the participants regarding the policies and governance surrounding physiotherapy services as well as international support for physiotherapy services within Liberia. Less than half of the participants agreed or strongly agreed that the government of Liberia supports physiotherapy services through adequate policies (47.6%) or that physiotherapy services are adequately integrated into the national health system (45.2%). From these findings, it appears that there is a gap in the understanding of the importance of physiotherapy services and a related gap exists in the comprehensive integration of rehabilitation services into health system planning.

In a different vein, most of the participants (78.3%) believe that non-governmental organisations make an important contribution to the development and delivery of physiotherapy services and therefore demonstrate the role of external groups in assisting with the rehabilitation of communities after conflict. While participants acknowledged the role of NGOs, they also expressed concern about the sustainability of physiotherapy services (66.8%). This overwhelming concern of the participants speaks to their fear of the ability of physiotherapy services to continue to be available due to dependence on donations and support from NGOs, underscoring the importance of increasing governmental support and leadership in the development of sustainable physiotherapy services in Liberia.

Table 6. Current Challenges and Future Sustainability of Physiotherapy Services

Challenge	Agree/Strongly Agree (%)
Workforce shortage	81.7
Insufficient funding	84.5
Geographic inequity	76.1
Need for government investment	88.2

Table 6 outlines respondents' perceptions of current challenges and future sustainability of physiotherapy services in Liberia. A large majority of respondents identified workforce shortages as a major challenge (81.7%), reflecting persistent gaps in the availability and distribution of trained physiotherapists. Insufficient funding was reported as the most critical constraint, with 84.5% agreeing or strongly agreeing that financial limitations continue to hinder service delivery and expansion.

Geographic inequity was also widely recognized, with 76.1% of respondents highlighting disparities in access to physiotherapy services between urban and rural areas. Notably, an overwhelming majority (88.2%) emphasized the need for increased government investment to ensure future sustainability of physiotherapy services. Collectively, these findings indicate that while progress has been made since the civil war, addressing funding shortfalls, workforce limitations, and inequitable service distribution through stronger government commitment is essential for building a resilient and sustainable

rehabilitation system in Liberia.

Discussion

The findings of this study illustrate the substantial impact of Liberia's civil war on physiotherapy services and the complex process of post-conflict recovery. Rather than reiterating service disruptions already described in the Results, this discussion contextualizes those disruptions within broader post-conflict health system experiences observed in fragile and conflict-affected states. Similar to other post-conflict settings, the collapse of rehabilitation services in Liberia reflects the combined effects of infrastructure destruction, loss of skilled personnel, and the prioritization of emergency and communicable disease responses over long-term rehabilitative care [17].

The gradual recovery of physiotherapy services observed in Liberia appears to be closely linked to sustained international engagement and broader health system reforms introduced after the conflict [18]. External partners played a pivotal role in rebuilding capacity through workforce training, infrastructure rehabilitation,

and technical assistance. While these collaborations facilitated early recovery, they also highlight a recurring tension in post-conflict health systems: external support can accelerate reconstruction but may delay the development of strong domestic ownership if not accompanied by long-term national planning and financing mechanisms.

Workforce development represents a critical area where progress and limitations coexist. Although training opportunities and workforce numbers have improved since the war, the findings suggest that current efforts are insufficient to meet the country's evolving rehabilitation needs [19]. Challenges related to professional retention, continuing education, and equitable workforce deployment persist, particularly in underserved areas. These gaps are especially concerning given the high burden of trauma-related and chronic conditions that require sustained rehabilitation services over time.

Geographic inequities remain a defining feature of physiotherapy service delivery in Liberia. Persistent differences between urban and rural areas reflect broader structural weaknesses within the health system [20]. Rural communities continue to face compounded barriers, including limited infrastructure, workforce shortages, transportation challenges, and financial constraints. These disparities undermine the effectiveness of national rehabilitation efforts and conflict with principles of equitable access to health care, which are central to post-conflict recovery and universal health coverage goals.

Governance and financing challenges further constrain the long-term sustainability of physiotherapy services. Limited government investment and weak policy integration leave rehabilitation services highly dependent on donor and NGO support [21]. While external funding has been essential for post-war recovery, prolonged reliance on non-state actors increases vulnerability to funding volatility and limits system resilience. Strengthening government leadership, embedding rehabilitation within national health strategies, and establishing sustainable financing mechanisms are therefore essential to securing long-term gains.

Looking forward, strengthening local education institutions and integrating physiotherapy into primary health care offer promising pathways toward sustainability [22]. Community-based rehabilitation initiatives, expanded training pipelines, and earlier intervention at the primary care level can improve access while reducing geographic inequities. These strategies align with global recommendations for post-conflict health system strengthening and underscore the potential contribution of physiotherapy services to Liberia's broader recovery and development goals.

Conclusion

Since the end of Liberia's civil war, notable progress has been made in rebuilding physiotherapy services nationwide. Advances in workforce capacity, institutional development, and service delivery reflect sustained national recovery efforts supported by international partners. Despite these gains, persistent challenges continue to limit the reach and

effectiveness of physiotherapy services. These include inadequate and unstable funding, difficulties in retaining trained personnel, and marked inequities in access—particularly between urban and rural areas and among underserved populations. Addressing these challenges will require stronger policy commitment, greater government ownership of rehabilitation services, and sustained investment to support a comprehensive, equitable, and resilient physiotherapy system in Liberia [23].

Take-Home Message

Post-conflict recovery efforts have enabled Liberia to re-establish physiotherapy services through workforce rebuilding, infrastructure improvements, and substantial international support. However, access to care remains uneven, with rural communities facing ongoing shortages of trained personnel, equipment, and services. Long-term sustainability will depend on reducing reliance on non-governmental organisations by integrating rehabilitation more fully into national health policy and financing frameworks. Increased domestic investment, strengthened training pathways, and a commitment to equitable service delivery are essential to ensuring that all Liberians can access effective and sustainable physiotherapy care.

Author's Contribution

Dr. Stephen Saah Bonard originated the research project, created the initial design of this research project, and participated in collecting the data and preparing the manuscript. Prof. (Dr.) Daniel Mairafi Gimbason was the supervisor of this study, provided direction on methodology, critically assessed the

manuscript and was involved in interpreting the results of this study. Dr. Stephen Monday assisted with the analysis of the data and in writing the manuscript and its revisions. All authors approved the final manuscript before its submission.

Conflict of Interest

No authors have any conflicts of interests related to the publication of the current study. This study was carried out independently without the influence of any financial, institutional or personal relationships in designing, collecting, analyzing, interpreting, or writing this manuscript. All authors have read and concurred with the final version of the paper.

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