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SYSTEMATIC REVIEW Open Access

Clinical effectiveness of telerehabilitation for chronic low back pain in Sub-Saharan Africa: a systematic review

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Abstract

Background Chronic low back pain (CLBP) is a leading cause of disability in Sub-Saharan Africa (SSA). While telerehabilitation (TR) is an emerging solution, its regional efficacy and implementation requirements are not well-synthesized. This systematic review primarily evaluates the clinical effectiveness of TR for managing CLBP in SSA. Additionally, it investigates the extent of possible sociocultural adaptation and identifies systemic barriers to implementation.

Methods A systematic search was conducted in accordance with PRISMA guidelines across PubMed, Google Scholar, Scopus, African Journal Online (AJOL), Web of Science, and CINAHL from inception to February 5, 2026. Eligibility was determined using the PICO framework, targeting randomized controlled trials (RCTs) of telerehabilitation for CLBP in Sub-Saharan Africa. Two reviewers independently performed title/abstract screening, full-text review, and quality assessment. Data were synthesized narratively to evaluate clinical effectiveness and categorize implementation barriers.

Results Three RCTs involving 147 participants were included. All studies were conducted in Nigeria and evaluated TR programs incorporating McKenzie therapy or core stability exercises. TR demonstrated significant improvements in pain intensity, disability, and quality of life ($p < 0.05$), comparable to in-person interventions. Notably, none of the interventions incorporated sociocultural adaptation. Reported implementation barriers included limited smartphone penetration, intermittent internet connectivity, low digital literacy, and insufficient healthcare worker training, reflecting broader infrastructural limitations in the region.

Conclusions Telerehabilitation for CLBP demonstrated clinical effectiveness in SSA, yet significant infrastructural and cultural challenges were mentioned to constrain its scalability. The lack of sociocultural tailoring in existing studies represents a critical gap. Future research and development should prioritize low-bandwidth, culturally adapted solutions that address local health beliefs to ensure the sustainability and regional adoption of digital spine care.

Keywords Chronic low back pain, mHealth, Telerehabilitation, Sub-Saharan Africa, Cultural adaptation, Implementation barriers

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Background

Chronic low back pain (CLBP) is a prevalent and disabling condition that affects millions of individuals worldwide. It is the leading cause of disability globally, with a substantial economic burden and a profound impact on quality of life [1]. In Sub-Saharan Africa (SSA), the burden of CLBP is particularly high, exacerbated by factors such as inadequate healthcare infrastructure, limited access to treatment, and socioeconomic challenges. The prevalence of CLBP in SSA has been estimated to range from 18% to 28%, with certain groups, such as rural populations, experiencing even higher rates due to the physical demands of farming and labor-intensive occupations [2]. In these areas, individuals often lack access to specialist care and may resort to traditional remedies or over-the-counter medications, which may not effectively address the underlying causes of CLBP.

Traditional clinical approaches in SSA are frequently symptomatic rather than rehabilitative, leading to delayed interventions and poor long-term outcomes. Consequently, there is an urgent requirement for scalable, evidence-based solutions suited for resource-constrained environments. Mobile health (mHealth), defined by the World Health Organization (WHO) as the application of mobile and wireless technologies to support healthcare delivery and public health practice [3], has emerged as a globally recognized strategy to bridge these gaps. Within the rehabilitation domain, this is operationalized as telerehabilitation (TR). TR refers to the delivery of rehabilitation services via telecommunication networks and the internet [4], facilitating remote clinician-patient interaction and the supervision of therapeutic protocols outside traditional clinical settings. These digital health interventions leverage mobile technologies, such as smartphones and tablets, to deliver healthcare services remotely, offering significant promise for improving access to care in underserved populations.

While mHealth interventions have proven effective for managing diabetes and hypertension in low- and middle-income countries [5], their application for CLBP in SSA faces unique hurdles. A primary obstacle is the lack of sociocultural tailoring. In SSA, pain is often viewed through spiritual or traditional lenses, which can influence health-seeking behaviors and the acceptance of digital medical interventions [6, 7]. Egwudo et al. [6], also noted that the lack of clear digital health policies and limited training for overburdened healthcare workers in SSA could further impede the integration of digital tools into standard practice.

Despite the potential of TR to improve CLBP outcomes, the current evidence base in SSA remains sparse and fragmented. To date, there is no systematic synthesis of available data evaluating either the clinical efficacy or the feasibility of implementing these interventions in the African context. This systematic review aims to fill a critical gap by evaluating the effectiveness of TR in reducing pain intensity, disability, and improving quality of life in SSA. Concurrently, it examines the role of sociocultural adaptations and identifies the systemic barriers to regional adoption. By synthesizing this evidence, the review provides actionable insights for developing sustainable, contextually appropriate digital spine care.

Methods

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, ensuring transparency, rigor, and consistency in the selection, synthesis, and reporting of relevant studies [8]. The goal is to evaluate the effectiveness of TR in managing CLBP in SSA and to explore the role of cultural adaptation and barriers to its implementation. The review protocol has been registered in the PROSPERO database under the approval ID: CRD420251172472. The review included only data from published articles, covering studies from database inception to February 5, 2026.

Eligibility criteria

To ensure the relevance and rigor of the included studies, specific inclusion and exclusion criteria have been established:

Inclusion Criteria:

1. **Population**: Studies involving adults (18 years and older) diagnosed with chronic low back pain, living in SSA, with no restriction on the severity of pain.
2. **Interventions**: Studies that evaluate TR or mHealth interventions delivered via mobile technologies such as smartphones, tablets, or other mobile devices to deliver healthcare services aimed at managing or alleviating CLBP. While this review specifically investigates the presence and impact of cultural tailoring (interventions adjusted to align with local traditions, languages, practices, or health beliefs), such tailoring was not a mandatory criterion for inclusion. This approach enables a comprehensive comparison of standard digital interventions and those adapted to the local sociocultural context.
3. **Comparators**: Studies must have a comparator group, which could include:

    i. No intervention (e.g., waitlist control, usual care).
    ii. Other interventions (e.g., in-person clinical treatments, traditional medicine).

4. **Outcomes**: The study must report on at least one of the following outcomes:

Primary outcomes: Reduction in pain intensity, improvement in physical function (disability), and quality of life related to CLBP.
Secondary outcomes: Patient satisfaction, intervention adherence, engagement rates, cultural acceptability, and usability of the TR.

5. **Study Design**: The review will include RCTs, non-randomized controlled trials, cohort studies, observational studies, and pilot studies. Only studies published in English will be included.

Exclusion Criteria:

1. Studies that do not focus on CLBP or do not involve populations from SSA.
2. Studies that do not involve TR or mHealth.
3. Studies that do not provide relevant outcome data or are not published in peer-reviewed journals.
4. Editorials, opinions, or commentaries that do not report original research.

Information sources and search strategy

A systematic search was conducted across five primary electronic databases: PubMed, Scopus, African Journals OnLine (AJOL), Web of Science, and CINAHL. The search was performed from database inception through February 5, 2026. To supplement these sources, additional searches were conducted via Google Scholar and gray literature sources, including conference proceedings and health organization reports. Reference lists of all eligible studies were manually reviewed. The search utilized Subject Headings and free-text keywords combined with Boolean operators. For example, the Scopus strategy used: (TITLE-ABS-KEY("low back pain") OR TITLE-ABS-KEY("spinal pain")) AND (TITLE-ABS-KEY("telerehabilitation") OR TITLE-ABS-KEY("mHealth")). To maintain high sensitivity, no geographical or language limits were applied during the initial search phase. See Appendix 1 for details of the search strategy across the databases.

Study selection and screening

All identified records were imported into Covidence for duplicate removal and screening. Two independent reviewers (AA and BB) screened all titles and abstracts. Subsequently, the reviewers (AA and BB) independently assessed the full text of the remaining articles. As the inclusion criteria were highly standardized, no discrepancies were encountered. The selection process is summarized in the PRISMA flow diagram (Fig. 1).

Data extraction

Data were independently extracted by two reviewers (AA & BB) using a standardized data extraction form. The form included the following categories: Study Characteristics (Authors, year of publication, study design, country of study, and setting), Sample size and demographic characteristics of participants (age, gender, occupation, and health status). Intervention details (e.g., type of mHealth technology, duration, and frequency). Type of mHealth technology used (mobile apps, SMS, web-based platforms, etc.), description of the cultural tailoring component (e.g., language, content, delivery mode, cultural practices, and beliefs addressed), and target behaviors and components of the intervention (e.g., pain management strategies, physical exercises, education on back health, etc.).

Outcomes

Primary outcomes Pain intensity (measured via Visual Analog Scale [VAS], Numerical Rating Scale [NRS]), disability (measured via the Roland-Morris Disability Questionnaire or Oswestry Disability Index), and quality of life (measured using the Short-Form 36 Health Survey [SF-36] or other relevant instruments). Secondary outcomes include patient satisfaction, adherence to the intervention, engagement rates, and acceptability (measured through interviews or surveys).

Barriers

Any reported barriers to implementation, including technological, infrastructural, cultural, and healthcare system-related barriers. No discrepancies were reported during the review process, which reflects the high level of agreement between the reviewers.

Quality assessment

The methodological quality of the included studies was independently assessed by two reviewers using the Cochrane Risk of Bias 2 (RoB 2) tool [9]. Each study was evaluated across five distinct domains: (1) randomization process (2), deviations from intended interventions (3), missing outcome data (4), measurement of the outcome, and (5) selection of the reported result. Based on the assessment of these domains, an overall risk of bias was determined. The summary of the quality appraisal for the three included studies is presented in Table 3.

Data synthesis

A narrative synthesis was employed to analyze the clinical outcomes and implementation barriers identified in the included studies. The synthesis evaluated the effectiveness of TR in reducing pain intensity, disability, and improving quality of life, using both pre- and post-intervention measurements for each study. Given the limited number of studies and the heterogeneity of interventions as seen in Table 2, a quantitative meta-analysis was not

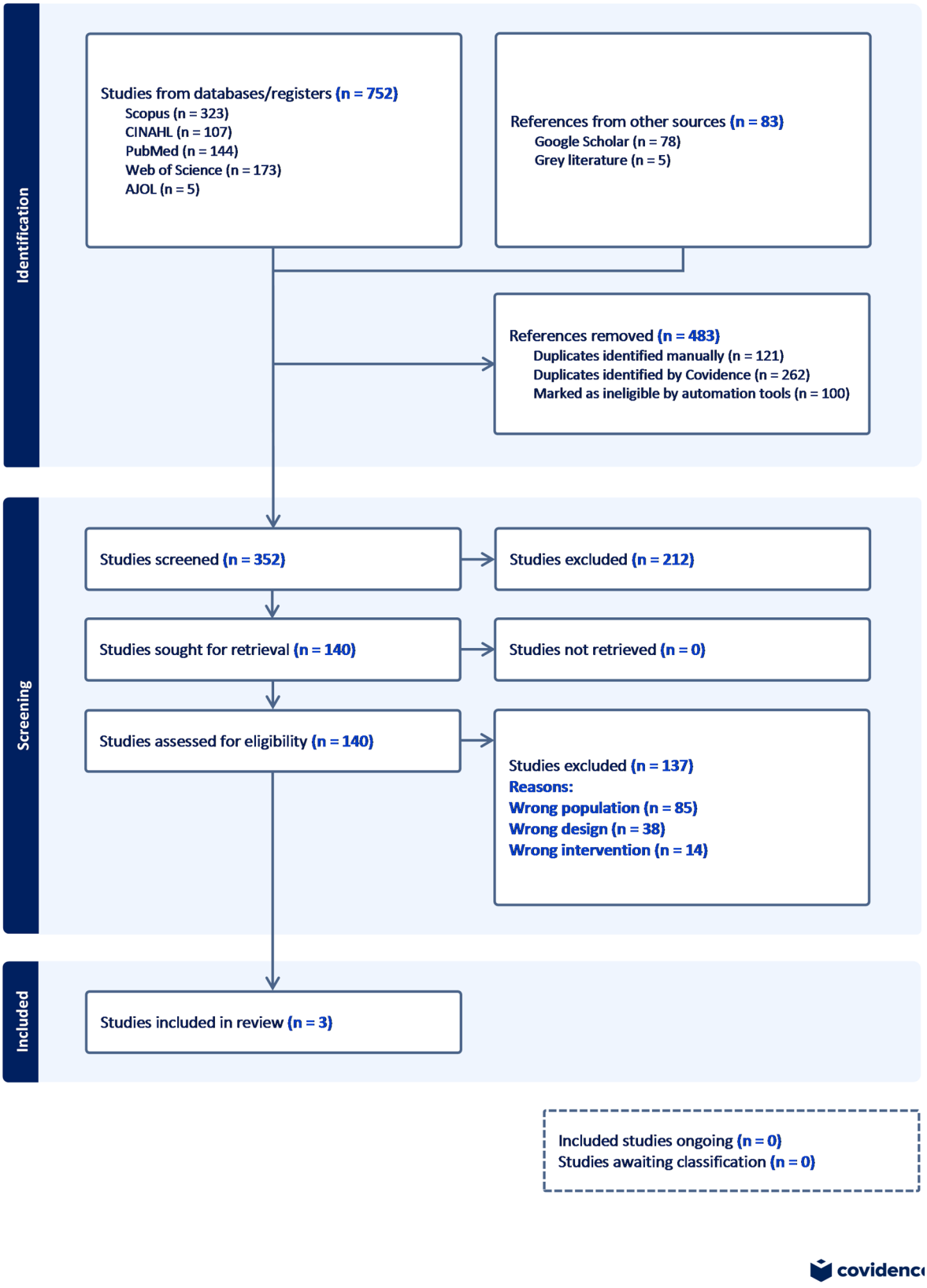

Fig. 1 PRISMA flow diagram

appropriate. For implementation barriers, the synthesis followed a two-step approach:

1. **Categorization**: Extracted data were mapped onto four predefined domains (Technological, Infrastructural, Cultural, and Healthcare System-related).
2. **Contextual Description**: The specific challenges within each domain were narratively described to highlight the limitations to scalability in the target region.

This structured narrative approach allowed for a clear comparison of barriers across different telerehabilitation platforms.

Ethical considerations

This systematic review does not require ethical approval as it involves the analysis of existing data from published studies. However, all studies included in the review must have received ethical approval from relevant institutional review boards or ethics committees.

Results

Study selection and characteristics

The systematic search identified three RCTs conducted in Nigeria that met the inclusion criteria for this review, out of a total of 110 articles screened. See Fig. 1 for the PRISMA flowchart process. All studies evaluated the use of TR in adults with CLBP, comparing remote exercise-based programs with traditional clinic-based or manual therapy approaches. These studies collectively involved 147 participants aged between 25 and 65 years, with an average intervention duration of 8 weeks. Each study assessed the impact of the interventions on key outcomes, including pain intensity, functional disability, and quality of life, with secondary outcomes related to patient satisfaction and adherence to the interventions. Table 1 summarizes the studies included in the review, featuring data extracted from the studies.

Intervention characteristics

All three RCTs evaluated exercise-based telerehabilitation interventions delivered via mobile platforms. The interventions primarily focused on McKenzie therapy, with the studies by Fatoye et al. [10], Mbada et al. [11], and Mbada et al. [12] all incorporating remote delivery methods. These TR programs consisted of scheduled online sessions, which included video demonstrations of exercises led by physiotherapists, and home-based exercise monitoring. In the studies, Mbada et al. [12] and Fatoye et al. [10] implemented with telerehabilitation-based McKenzie therapy through video consultations and mobile applications that guided participants through

Table 1 Showing results of the included studies

S/NO	Authors (Year)	Country	Study Design	Sample Size Analyzed	Intervention	Comparator	Key Outcomes	Findings	Cultural Adaptation	Implementation Barriers
1	Fatoye, et al. [10]	Nigeria	RCT	47	Telerehabilitation-based McKenzie therapy (TBMT)	Clinic-based McKenzie therapy (CBMT)	Pain intensity (VAS), Disability (ODI), Quality of Life (SF-36)	Telerehabilitation was more cost-effective and slightly more effective than clinic-based therapy.	No cultural adaptation recorded	Limited access to smartphones, digital literacy gaps
2	Mbada, et al. [11]	Nigeria	RCT	49	Telerehabilitation-based McKenzie therapy (TBMT)	Spinal manual therapy (SMT)	Pain intensity, Disability, Health-related Quality of Life (SF-12)	Both interventions were effective; telerehabilitation showed higher long-term health perception.	No cultural adaptation recorded	Limited mobile network coverage, low adherence in rural areas
3	Mbada, et al. [12]	Nigeria	RCT	47	Telerehabilitation-based McKenzie therapy (TBMT)	Clinic-based McKenzie therapy (CBMT)	Pain intensity (QVAS), Disability (RMDQ), Health-related Quality of Life (SF-12)	Both interventions showed improvements, but no significant differences. TBMT had a higher improvement in vitality (SF-12) at 8 weeks.	No cultural adaptation recorded	Poor network connectivity, unfamiliarity with the digital platform, limited access to smartphones

therapeutic exercises remotely. Participants were encouraged to engage in the exercises at home, with physiotherapists providing guidance, support, and adjustments to the exercises via weekly video calls or app-based check-ins. The control groups in these studies received with clinic-based McKenzie therapy or spinal manual therapy delivered in-person, where physiotherapists administered the exercises directly.

Effectiveness of telerehabilitation

Analysis across the selected trials [10–12] reveals a consistent longitudinal trend of improvement in all primary outcomes from baseline to the eight-week follow-up. While individual studies varied in their comparative focus, a collective pattern emerges where telerehabilitation-based interventions produced clinical gains that were statistically non-inferior to traditional manual and clinic-based therapies. Specifically, the data from Fatoye et al. [10] indicates that the magnitude of reduction in pain and disability was significantly more pronounced in the TR group than in the clinic-based cohort. Furthermore, despite the differences in remote delivery methods (e.g., mobile apps vs. stability training), within-group analysis across these studies [11, 12] consistently yielded p-values of < 0.05 for functional capacity and psychological well-being. Notably, the long-term health perception recorded via the SF-12 in the TR groups [12] surpassed that of the spinal manual therapy groups, suggesting that digital interventions may facilitate a higher level of perceived recovery. Table 2 further summarizes these comparative outcomes and their corresponding statistical significance.

Pain intensity

As noted in Table 2, pain intensity was a primary outcome in two studies [11, 12], measured using different tools [Visual Analogue Scale (VAS) and Numeric Pain Rating Scale (NPRS)], respectively. VAS was used to measure pain intensity as a secondary outcome in the study by Fatoye et al. [10]. The authors reported a significant reduction in pain intensity in both the telerehabilitation-based McKenzie therapy and clinic-based McKenzie therapy groups, with telerehabilitation-based McKenzie therapy showing a slightly greater reduction compared to clinic-based McKenzie therapy groups. However, the difference between the two groups was not statistically significant, suggesting that both interventions were similarly effective in reducing pain. Mbada et al. [12] also

Table 2 Summary of study outcomes and statistical significance

Authors (year)	Outcome Category	Outcome Measure (Tool)	Baseline (Mean ± SD)	Week 8 (Mean ± SD)	p-value (Within-group)	Conclusion
Mbada et al. (2024)	Pain Intensity	Current Pain (VAS)	4.29±1.38	0.48±0.51	p=0.001	TBMT is as effective as spinal manual therapy.
	Functional Disability	Activity Limitation (RMDQ)	8.61±4.38	2.25±2.05	p=0.001	Significant improvement in daily tasks via telerehabilitation.
	Quality of Life	HRQoL (SF-12)	37.0±4.3	43.9±3.1	p=0.001	Long-term health perception improved significantly.
Mbada et al. (2019)	Pain Intensity	Average Pain (NPRS)	4.95±0.92	0.76±0.94	p=0.001	TBMT outcomes are comparable to clinic-based care.
	Functional Disability	Participation Restriction (ODI)	24.1*	25.0*	p=0.001	Effectively reduces disability via a mobile platform.
	Quality of Life	General Health (SF-12)	69.9±8.7	75.9±6.4	p=0.001	Significant gain in 'Vitality' compared to clinic groups.
Fatoye et al. (2020)	Functional Disability	Disability Level (ODI)	31.0±10.3	16.7±6.3	p<0.05	TBMT is clinically effective for disability reduction.
	Quality of Life	Utility Score (EQ-5D-5L)	0.085 (Gain)	—	—	TBMT is cost-saving and more effective.

*Note: For Mbada et al. (2019), Participation Restriction was analyzed using Mean Ranks. For Fatoye et al. (2020), Pain Intensity was a secondary factor and not the primary outcome reported in the cost-utility analysis

Table 3 Showing the cochrane risk of bias (RoB 2) scores for the included studies

Study	Bias in Randomization	Deviations from Interventions	Missing Outcome Data	Measurement of Outcome	Selection of Reported Results	Overall Risk of Bias
Fatoye et al. [10]	Low risk	Some concerns	Low risk	Some concerns	Low risk	Some concerns
Mbada et al. [11]	Low risk	Some concerns	Low risk	Low risk	Low risk	Some concerns
Mbada et al. [12]	Low risk	Some concerns	Low risk	Low risk	Low risk	Some concerns

found significant improvements in pain intensity across both groups. Although improvements were observed in both with telerehabilitation-based McKenzie therapy and spinal manual therapy, no significant difference was noted between them, indicating that both treatments were equally effective in reducing pain. Similarly, Mbada et al. [11] found that both with telerehabilitation-based McKenzie therapy and with clinic-based McKenzie therapy led to significant pain relief by the 8-week follow-up. However, no significant difference was observed between the groups.

Functional disability level

Functional disability level, measured using the ODI in Fatoye et al. [10] and the RMDQ in Mbada et al. [11], was another key outcome across the studies. In Fatoye et al. [10], both with telerehabilitation-based McKenzie therapy and with clinic-based McKenzie therapy resulted in significant improvements in functional disability, with telerehabilitation-based McKenzie therapy showing slightly greater improvement. However, the difference between the two groups was not statistically significant. Mbada et al. [12] also found significant reductions in disability in both the with telerehabilitation-based McKenzie therapy and spinal manual therapy groups. The results indicated that both interventions were effective, but no significant difference was found between the two, suggesting that either approach could be beneficial in improving functional mobility. Mbada et al. [11] also reported significant reductions in functional disability in both groups, with telerehabilitation-based McKenzie therapy showing a slightly better improvement by the 8-week follow-up. However, the difference between the groups was not significant.

Quality of life

The studies measured quality of life using various scales: SF-36 in Fatoye et al. [10], SF-12 in Mbada et al. [12] and Mbada et al. [11]. The studies found consistent improvements in quality of life across both groups, although there were slight differences between the interventions. Fatoye et al. [10] reported improvements in quality of life (SF-36) in both groups, but the differences were not significant. However, the telerehabilitation group showed a slightly greater improvement in the physical functioning component of quality of life. Mbada et al. [12] observed significant improvements in quality of life (SF-12) in both groups. However, telerehabilitation-based McKenzie therapy participants showed greater improvement in the physical component of quality of life at the 8-week follow-up. Mbada et al. [11] found significant improvements in general health status and mental health for both groups. The telerehabilitation-based McKenzie therapy group showed slightly greater improvement in the vitality component of the SF-12 than clinic-based McKenzie therapy over 8 weeks.

Feasibility and sociocultural tailoring

Despite the potential benefits of these interventions, adherence was sometimes affected by network interruptions and patient unfamiliarity with the digital platform. Participants in rural areas experienced difficulties with internet connectivity, which may hinder the seamless delivery of the telerehabilitation sessions. Additionally, none of the included studies incorporated local-language interfaces or integrated sociocultural components into the design of the TR interventions, which could have enhanced engagement and effectiveness for participants from diverse cultural backgrounds.

Risk of bias assessment

The Cochrane Risk of Bias (RoB 2) tool was used to assess the methodological quality of the three studies. Table 3 shows summary of the quality of the included studies appraised. The overall findings indicated that Mbada et al. [10], Mbada et al. [12], and Mbada et al. [11] were all low risk in terms of randomization, missing data, and selection of reported results. However, some concerns were noted in the 'deviations from intended interventions' domain, particularly regarding the lack of blinding of participants and the potential for performance bias in the telerehabilitation groups. Despite these concerns, the studies were generally well-conducted, and the outcomes appear to be robust.

Discussion

This systematic review aimed to assess the effectiveness of telerehabilitation in managing CLBP among adults in sub-Sahara Africa. Three RCTs were included in this review, all conducted in Nigeria, with pain intensity, functional disability, and quality of life as key outcome measures. The findings of this review suggest that telerehabilitation is an effective alternative to traditional clinic-based interventions for managing chronic low back pain.

Across all three studies, both telerehabilitation-based McKenzie therapy and clinic-based McKenzie therapy or spinal manual therapy demonstrated significant improvements in pain intensity, disability, and quality of life. However, the studies consistently showed no significant differences between the interventions in pain reduction and functional improvement, indicating that telerehabilitation can be as effective as clinic-based therapies in reducing pain and improving functional outcomes. Interestingly, while both interventions improved quality of life, TR was particularly beneficial for physical function and vitality in the long term. This finding is consistent with trends in other digital health interventions, where remote therapy provides added flexibility and convenience for participants, potentially contributing to sustained improvements in quality of life [10]. The results of this review align with findings from similar studies conducted in high-income countries, where telerehabilitation has been shown to improve functional mobility and reduce pain in individuals with CLBP [13]. However, while these results are encouraging, it is essential to recognize the context-specific nature of these interventions. In rural African settings, where infrastructure and healthcare access are major challenges, the delivery of telerehabilitation could play a pivotal role in expanding access to evidence-based pain management strategies. Thus, the potential scalability of these interventions in rural settings, particularly in SSA, presents a unique opportunity to address the growing burden of chronic pain.

A significant finding of this review is that none of the included studies incorporated explicit cultural adaptation strategies. While the interventions were clinically effective in the short term, the lack of sociocultural integration may limit the scalability and patient 'buy-in' of digital health platforms in Sub-Saharan Africa. This aligns with existing literature suggesting that interventions that do not account for local health beliefs regarding spinal pain may see lower long-term adherence once the initial clinical oversight is removed [5]. As noted by Igwesi-Chidaobi et al. [14], cultural factors significantly influence health behaviors and treatment-seeking patterns in many African communities, where pain is often attributed to spiritual or metaphysical causes. Without addressing these beliefs, digital health interventions risk being rejected or underused.

Culturally tailored interventions have been shown to improve engagement, adherence, and outcomes in other areas of health, such as maternal and child health [15]. Similarly, integrating traditional healing practices alongside evidence-based telerehabilitation could improve the acceptance and success of these interventions. For example, incorporating culturally appropriate education materials, community-based support, and local languages into mHealth platforms could enhance the user experience and increase adherence to the program. Future studies in SSA should focus on developing culturally adapted telerehabilitation programs that incorporate these local practices and beliefs, ensuring that they resonate with the target population and foster higher levels of engagement.

Emerging evidence from 2025 identifies critical systemic barriers that continue to impede the efficacy of traditional, in-person medical interventions for chronic conditions [5, 16]. In response, this analysis evaluates the extent to which remote digital strategies have successfully bypassed these conventional hurdles. The synthesized data from the included trials [10–12] indicate that TR is a clinically potent alternative to traditional care. Across all studies, TR cohorts demonstrated significant longitudinal improvements in clinical status from baseline to the eight-week primary endpoint ($p < 0.05$). While the clinical potency of mHealth is well-established, these studies suggest that implementation barriers, rather than clinical ones, now represent the primary barrier to the broad scalability of telerehabilitation within rural African healthcare infrastructure. The most significant challenges include poor internet connectivity, limited smartphone access, and low digital literacy among patients and healthcare workers [10–12]. These barriers are not unique to Africa but are prevalent in many low- and middle-income countries. Okano et al. [17] highlighted that although mobile phones are widely available across Africa, smartphone ownership and access to internet-based interventions are limited in rural areas. This disparity may impact the feasibility of delivering data-intensive mHealth interventions in those regions. Furthermore, digital illiteracy remains a substantial barrier in many African countries, where literacy rates and access to digital education are relatively low [18]. This lack of technological readiness can lead to non-adherence to mHealth programs, as patients may struggle to navigate mobile health apps or engage with remote healthcare providers. Akodu et al. [19] identified that healthcare workers' lack of digital competence further compounded the implementation challenge, as they were unable to effectively integrate telerehabilitation into routine clinical care.

Addressing these barriers requires a multifaceted approach, including developing low-bandwidth solutions accessible on feature phones (mobile devices with limited internet capabilities and physical keypads) and training programs for healthcare workers and patients to improve digital literacy. Moreover, it is essential that TR platforms be designed with user-friendly interfaces to ensure accessibility for individuals with varying levels of technical expertise. In this regard, integrating SMS-based interventions or voice-based platforms may be a promising alternative, especially in regions with limited mobile internet access. In addition to technological barriers, the

successful implementation of telerehabilitation requires systemic integration and policy support. Many African countries lack comprehensive digital health policies that support the integration of mHealth into national health systems. The lack of standardized protocols, guidelines, and regulatory frameworks for mHealth interventions hinders their widespread adoption and scaling. Furthermore, the absence of robust health data protection regulations poses significant ethical and legal concerns, particularly when handling personal health data. A concerted effort by national governments, international health organizations, and technology developers is required to create a policy environment that supports the development and scalability of mHealth solutions.

The findings of this review suggest that TR can be considered a viable alternative to clinic-based interventions for the management of chronic low back pain. The flexibility and cost-effectiveness of telerehabilitation make it an attractive option, particularly in low-resource settings where access to healthcare may be limited. TR offers the potential to overcome barriers to in-person treatment, including transportation costs, time constraints, and limited access to trained therapists.

Recommendations

To fully realize the benefits of TR, future research should address several key areas:

1. Future studies should explore how cultural relevance can be integrated into TR interventions to enhance participant engagement. This may include translating materials into local languages, incorporating culturally accepted health beliefs, and involving local healthcare providers in the design and delivery of the intervention.
2. While the studies in this review demonstrated short-term effectiveness, it is important to assess the long-term sustainability of TR. Future studies should follow up with participants beyond the 8-week period to evaluate whether improvements in pain, function, and quality of life are maintained over time, and should include multicenter trials in SSA.
3. Adherence to TR interventions remains a challenge. Future research should focus on developing strategies to increase engagement and reduce dropout rates, such as through personalized support, interactive features in apps, or incentive-based models.
4. As identified in this review, technological limitations are a significant barrier to the implementation of TR. Research is needed to assess ways to improve access to devices and internet connectivity, particularly in rural or underserved areas. Collaborations with telecommunication providers and healthcare agencies could help overcome these technological challenges.

Limitations of the study

A primary limitation of this review is the geographical homogeneity of the included literature. All eligible studies originated from a single research cluster in South-West Nigeria. Consequently, the findings regarding feasibility, such as internet stability and sociocultural acceptance, may be idiosyncratic to the Nigerian digital infrastructure and may not be directly generalizable to regions with different technological or linguistic landscapes (e.g., Francophone or Lusophone Africa). The lack of diversity in the current evidence base highlights a critical need for independent research teams across the continent to validate these telerehabilitation protocols. In addition, the lack of cultural adaptation in the included studies restricts their relevance to diverse communities. Furthermore, the heterogeneity of interventions prevented a meta-analysis, and the studies did not assess long-term outcomes. Finally, the review also lacked detailed strategies for addressing implementation barriers, such as limited smartphone access and low digital literacy.

Conclusion

In conclusion, this review reinforces that telerehabilitation offers clinical benefits comparable to those of traditional clinic-based therapies for CLBP, consistent with global findings. However, the current literature reveals a critical lack of explicit cultural adaptation strategies that may affect long-term patient engagement and sustainability in SSA. While technological and infrastructural barriers persist, the comparable clinical outcomes between TR and traditional care justify the integration of digital health into spinal rehabilitation protocols. Future research should prioritize developing culturally tailored digital interventions to enhance the sociocultural relevance and scalability of TR across the region.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s44247-026-00261-0.

Supplementary Material 1

Author contributions

BB – Conceptualization, Data curation, formal analysis, writing original draft, and methodology. AA: writing original draft, data curation, and methodology. UU: writing review, editing, project administration, and supervision. All authors participated in the revision of the manuscript and read and approved the submitted version. BB is the guarantor for the article.

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Data availability
All data supporting the findings of this study are available within the paper and its Supplementary Information.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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