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Research Article

Challenges and Obstacles of Clinical Research in Africa: The Case of HIV

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ABSTRACT

Introduction: As 2023, Africa accounted for nearly two-thirds of the global population living with HIV. Research is essential in achieving the goal of eliminating HIV by 2030. Globally, only 20 to 30% of clinical trials are conducted in low- and middle-income countries. The objective of our work was to describe the challenges and obstacles related to clinical research in Africa in the context of HIV infection.

Methodology: We carried out a cross-sectional, descriptive study with analytical objectives through a targeted, self-administered, semi-structured questionnaire. Healthcare professionals (doctors) involved in the fight against HIV in Africa were surveyed and responded to our study.

Results: 370 respondents were registered, mainly from West Africa (62.43%) and Central Africa (30.27%). 59.45% reported limited research budgets, while 41.62% found project submission procedures complex or unfamiliar and the priorities of donors do not meet the specific needs of Africa (40.54%). Lack of qualified personnel (54.32%), lack of a research-dedicated team (39.45%), low remuneration (45.13%) and the lack of suitable infrastructure (39.72%) are reported obstacles. The unavailability of medicines in the countries of the South (38.37%) and the complexity of obtaining ethical approvals (26.21%) represented the challenges to be overcome in the context of clinical research.

Conclusion: Improved access to funding, expanded budgets, better infrastructure, and a more qualified workforce would strengthen Africa's capacity for clinical research.

Keywords

Clinical Research, Obstacles, Challenges, HIV.

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Introduction

HIV/AIDS remains a major global public health challenge. The latest UNAIDS statistics (2023) on the state of HIV/AIDS reveal that 88.4 million people have been infected worldwide. Of these, 39.9 million were living with the virus in 2023 [1].

In response to this crisis, extensive research has been conducted, leading to significant progress.

Clinical research focuses primarily on therapeutic innovations because antiretrovirals play a central role in the management of this disease. HIV research is particularly dynamic, encompassing new diagnostic and therapeutic strategies, prevention trials, and vaccine studies. It must constantly evolve to address emerging public health challenges—such as viral resistance—where treatment guidelines can become outdated within months [2]. The Clinical Trials Community Africa Network (CTCAN) reports that Africa, home to 17% of the world's population, bears 25% of the

global disease burden. However, fewer than 3% of global clinical trials are conducted on the continent [3]. Additionally, only 3.2% of global scientific publications originate from Africa [4].

Despite its limited representation in global research, Africa has contributed significantly to HIV clinical studies particularly in HIV-2 ranging from early epidemiological investigations to groundbreaking therapeutic innovations. Sustained investment in funding, ethical frameworks, and international collaboration is vital to overcoming both current and future challenges in HIV research.

It is within this framework that we conducted our study among health stakeholders with the main objective of determining the main challenges and obstacles to clinical research on HIV in Africa.

Methodology

We conducted a descriptive qualitative cross-sectional study in 2024, based on a semi-structured interview with analytical objectives. We included physicians practicing in Africa, involved in the management of HIV infection and clinical research. The questionnaire consisted primarily of multiple-response items using a five-point Likert scale (strongly agree to strongly disagree), along with one open-ended question. It was distributed to physicians involved in HIV management and clinical research in Africa. Data were collected using a self-administered online questionnaire via Google Forms. Responses were automatically logged into an Excel database for subsequent analysis.

Data analysis was conducted using R software (version 4.2.2). In the descriptive analysis, all qualitative variables were examined in terms of counts and frequencies.

A qualitative synthesis of open-ended responses was conducted, with key themes identified and reported based on response frequency. In the analytical phase, we examined associations between respondents' region of residence and their perceptions of obstacles to clinical research. Chi-square and Fisher tests were used based on suitability, with a significance threshold of 5%. Ethical guidelines were strictly followed, ensuring voluntary participation, online informed consent, and full anonymity and confidentiality of collected data.

Result

A total of 370 individuals participated in the survey, with 62.70% residing in West Africa and 30.27% (n=112) in Central Africa. A majority of respondents (73.78%) believed that budgets allocated to scientific research in Africa are often limited. Nearly two-thirds of respondents (63.51%) considered that the submission procedures for international funding are complicated or unknown. Survey responses were divided on knowledge of donors, as shown in Table 1. Indeed, nearly half of respondents (47.02%) reported not knowing the donors funding research projects. Additionally, 63.24% believed that donor-funded research priorities do not align with Africa's specific needs. Among them, 40.54% declared themselves in complete agreement with this statement. A total of 63.52% of participants identified limited collaboration among researchers, along with difficulties in accessing research networks or securing partnerships, as significant barriers to clinical research. Nearly two-thirds of participants (66.49%) responded that low remuneration of research team members was a major difficulty in developing clinical research. Additionally, 63.24% of participants felt that research activities receive inadequate recognition from political and health authorities in their countries. The lack of availability of certain drugs in developing countries post-research was seen as a barrier by 59.19% of respondents.

Similarly, 59.73% of respondents reported inadequate infrastructure including laboratory facilities, cold chain systems, and data management resources as a major hindrance to clinical research. A plurality of participants (44.59%) did not view patient recruitment as a significant challenge for clinical research. However, 31.08% of respondents identified low HIV prevalence and patient refusals as considerable barriers to clinical research. The process of obtaining ethical and regulatory approvals was regarded as complex or time-consuming, with 48.11% of respondents generally agreeing with this assessment.

Regarding the shortage of qualified personnel in clinical research, 54.33% of participants generally agreed with this concern, while

Table 1: Challenges and obstacles to clinical research according to respondents (n = 370).

	I don't agree at all	Disagree	Neither agree nor disagree	All right	Completely agree
Insufficient funding	220 (59.45%)	53(14.32%)	32(8.84%)	21(5.67%)	44 (11.89%)
Complexity of international financing procedures	154 (41.62%)	81(21.89%)	72(19.45%)	35(9.45%)	28(7.56%)
Knowledge of funders	51(13.78%)	54(14.59%)	91(24.59%)	83(22.43%)	91(24.59%)
Donor-funded research priorities	33(8.91%)	33(8.91%)	70(18.91%)	84(22.70%)	150 (40.54%)
Collaboration and integration of research networks	136(36.75%)	99(26.75%)	74(20%)	31(8.37%)	30(8.10%)
Motivation and recognition of members	36(9.72%)	39(10.54%)	61(16.48%)	79(21.35%)	155 (41.89%)
Perception of the impact of drug unavailability	40(10.81%)	46(12.43%)	65(17.56%)	77(20.81%)	142(38.37%)
Inadequate infrastructure	147(39.72%)	74(20%)	67(18.10%)	41(11.08%)	41(11.08%)
Patient recruitment	64(17.29%)	51(13.78%)	90(24.32%)	84(22.70%)	81(21.89%)
Patient database	105(28.37%)	84 (22.70%)	69(18.64%)	49(13.24%)	63(17.02%)
Ethics	97(26.21%)	81(21.89%)	67(18.10%)	57(15.40%)	68(18.37%)

45.67% expressed disagreement or remained neutral. Among the professional categories identified as insufficient and posing obstacles to clinical research, research technicians (65.14%), biostatisticians (64.32%), and doctors (61.89%) were the most frequently cited. In contrast, nurses were the least frequently identified as lacking in clinical research personnel (Table 2).

Table 2: Distribution of respondents according to their perception of the lack of qualified personnel in clinical research.

Missing staff	Effective	Percentage (%)
Research Technician	241	65.14
Biostatistician	238	64.32
Doctor	229	61.89
Laboratory staff	221	59.73
Epidemiologist	220	59.46
Nurse	182	49.19

When asked about additional challenges and barriers in HIV clinical research, participants identified eight key obstacles. Table 3 highlights the most frequently cited themes, including lack of training and difficulties in securing funding. This adjustment improves readability and maintains the professional tone while ensuring a smooth flow. Let me know if you'd like any further refinements or send the next section when you're ready!

Table 3: Main obstacles encountered in clinical research on HIV according to respondents.

Main obstacles encountered	Effective
Training	33
Funding	29
Organization	19
Lack of political will	16
Partnership	8
Discrimination against HIV/AIDS and other social challenges	8
Scientific culture	8
Documentary resources	5
Lack of supervision for young people	5
Language	3
Logistics	3
Acknowledgement	2
Motivation	2

A comparative analysis of responses from Central and West African residents reveals notable differences regarding the shortage of qualified personnel and access to research networks (Figure 1).

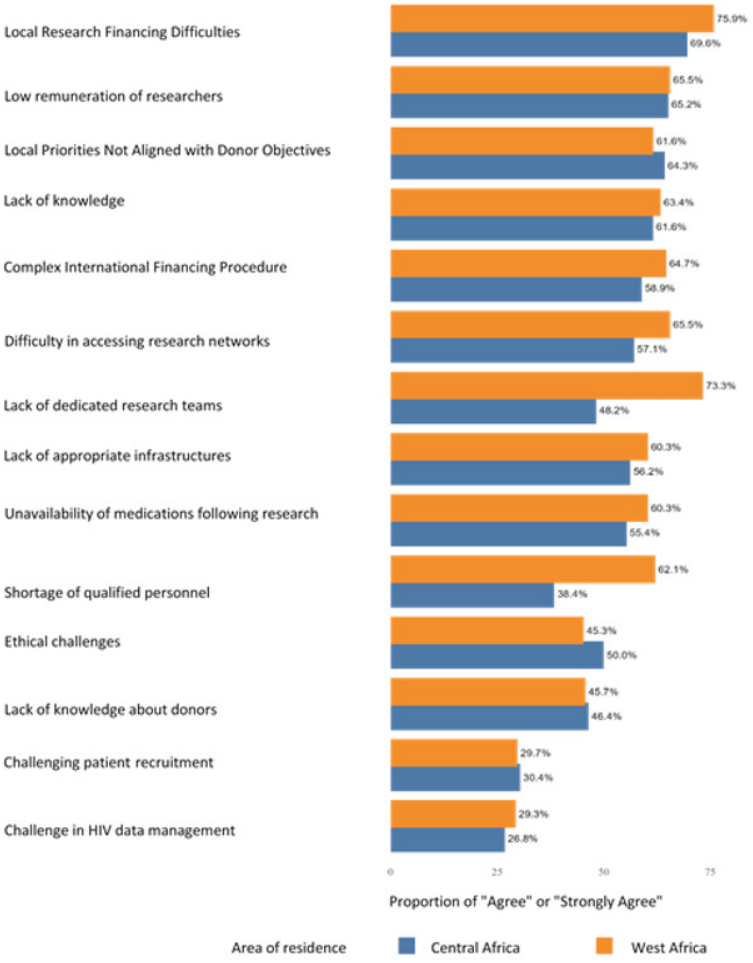

Figure 1: Distribution of respondents according to their perceptions of obstacles to research and according to their areas of residence.

Discussion

This qualitative descriptive cross-sectional study aimed to identify the key challenges and barriers in HIV clinical research across Africa. While several studies have examined this topic [5,6], ours stands out in methodology it is, to our knowledge, the first to directly gather physicians' perspectives, as key stakeholders, through questionnaires. A total of 370 physicians from the five regions of Africa took part in this survey. Participants' perspectives were analyzed across key dimensions, including infrastructure, funding, training, and policies influencing HIV clinical research in Africa. This approach provides an in-depth and continental view of the barriers encountered.

Funding Research in Africa

Our findings highlight multiple challenges related to research funding in Africa. Most respondents felt that funders' priorities do not align with the pressing needs of the population. Some clinical trials fail to prioritize urgent medical interventions targeting key diseases at local, national, or regional levels [7,8]. As a result, their findings do not translate into policies tailored to the specific public health needs of these regions. Additionally, clinical trial sites often face resource constraints, limiting their ability to conduct studies in accordance with international standards. These sites predominantly rely on external funding, while local financial contributions remain minimal [9].

Challenges Related to Collaboration and Integration of Research Networks

Our study revealed that most participants view limited researcher collaboration and difficulties in integrating research networks or forming partnerships as significant barriers to clinical research development in Africa. Many African researchers tend to collaborate with Western institutions rather than with their peers within Africa. This preference is largely driven by the funding opportunities and prestige associated with Western partnerships [10]. Additionally, few African universities have policies that actively promote cross-country research collaboration. Moreover, limited funding often forces researchers into isolation, prioritizing the protection of their ideas and publications over knowledge sharing [11]. Furthermore, connections between researchers and policymakers remain weak. These connections are hindered by bureaucratic obstacles, limited dialogue, and inadequate awareness of scientific progress. Complex institutional structures, resource shortages, and limited awareness of available technological solutions significantly restrict the practical impact of research [12].

Human Resources Management

Our study identified significant challenges in managing human resources for clinical research in Africa. Over half of the emphasized shortages in qualified personnel, particularly among physicians, research technicians, and biostatisticians the most frequently cited roles. Furthermore, most of participants identified low remuneration and inadequate recognition of research activities as major barriers to advancing clinical research in Africa. According to the African Medical Research Council in 2022, the shortage of qualified personnel is explained by inadequate clinical research training and the migration of skilled professional to countries offering better career prospects [13]. In addition, limited access to advanced technologies and resources further restricts the development of local expertise [14]. Furthermore, research teams' motivation is often impacted by challenging working conditions, including low salaries, heavy workloads, and uncertain career prospects [1]. Researchers are also overloaded with administrative tasks, which reduces their ability to concentrate on their scientific work. Finally, researchers' contributions often go unrecognized due to limited visibility in international publications and inadequate institutional acknowledgment [15].

Infrastructure and Access to Medicines Problem

Clinical research in Africa faces major obstacles related to infrastructure and access to medicines, significantly limiting its effectiveness and impact. Survey responses indicated widespread concerns about the unavailability of medicines not marketed in developing countries, alongside inadequate research infrastructure. This highlights that research infrastructure-particularly laboratories and clinical centers is often inadequate or outdated. Numerous institutions lack modern equipment and advanced technologies, hindering the conduct of high-quality studies. Hospitals and clinics across Africa experience chronic overcrowding and equipment shortages, limiting their capacity to participate in clinical trials [16]. Furthermore, access to medicines remains unequal. Drug production is unevenly distributed throughout the world. However, this situation varies considerably from country to country. While South Africa and Morocco produce 70 - 80% of their pharmaceutical requirements, some Central African nations rely on imports for up to 99% of their medicines [17].

Difficulties Related to Ethics and Patient Recruitment

Our analysis suggests that the complexities and prolonged timelines of ethical and regulatory approvals, as perceived by most participants, may hinder patient recruitment in clinical research. However, a relatively large proportion of participants did not consider patient recruitment to be a major difficulty for clinical research. Our findings indicate a strong connection between ethical concerns and patient recruitment in clinical research. A lack of awareness or limited understanding of ethical and regulatory processes may lead some participants to underestimate their impact on recruitment [18]. Additionally, Africa faces critical ethical and regulatory challenges, including informed consent complexities, risks of vulnerable population exploitation, and inequities in post-trial treatment access. Initiatives such as the WHO's African Vaccine Regulatory Forum (AVAREF) aim to build regulatory and ethical capacity in Africa to expedite clinical trial reviews while ensuring participant protection [19].

Obstacle to Clinical Research at the Regional Level

A regional analysis reveals two notable disparities in clinical research barriers. On the one hand, a shortage of qualified

personnel was identified as a significant challenge by 62.06% of West African respondents, compared to 38.39% in Central Africa. Similarly, 73.28% of West African respondents reported inadequate research equipment as a major challenge, compared to 48.21% in Central Africa. This suggests that the availability of qualified clinical research personnel, particularly in HIV research, is essential for the effective operation of these facilities. This relationship between skills and equipment could thus explain the convergence of opinions between the two regions. However, West Africa benefits from stronger funding, research investment, and better infrastructure compared to Central Africa [20,21]. In contrast, HIV prevalence is higher in Central Africa than in West Africa [22], with a more marked presence of HIV-1, known for its greater virulence [23]. This explains why HIV research is more developed and better distributed in Central Africa. Consequently, HIV clinical research in Central Africa is more developed due to differing research priorities and the epidemic's scale.

Conclusion

Our highlights key barriers to scientific research in Africa, including inadequate funding, procedural complexities, and limited awareness of donors whose priorities do not align with Africa's needs. Expanding research networks and fostering partnerships would mitigate existing challenges. Enhancing clinical research training curricula, improving workforce valuation, and investing in infrastructure would significantly advance the field.

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