EDITORIAL

Training and Clinical Research Capacity Building in Low- and Middle-Income Countries: Addressing Unmet Needs

Développer les capacités de formation et de recherche clinique dans les pays à revenu faible et intermédiaire: Relever le défi des besoins insatisfaits

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Abstract

The Middle East, Mediterranean, and Africa (MEMA) region, encompassing 68 countries and 20% of the global population, contributes only 6% of the world's registered clinical trials. This editorial identifies eight key barriers to clinical research in the region: (1) limited collaboration with high-income country (HIC) universities supporting low-income country (LIC) research, (2) insufficient specialized training programs, (3) inadequate laboratory and technological infrastructure, (4) lack of research methodology integration in medical curricula, (5) underdeveloped local institutional review boards, (6) insufficient and unsustainable funding, (7) limited technology transfer from HICs to LICs, and (8) migration of skilled professionals to HICs. These challenges hinder the region's research capacity and global contribution. Proposed solutions include fostering HIC-LMIC partnerships, enhancing training through scholarships and local research centers, improving infrastructure via international collaboration, and developing robust ethical review systems. By addressing these barriers, LMICs can increase their contribution to global clinical research, promoting equitable health outcomes.

Key words: Clinical Research, Low Income Countries, Unmet Needs

Résumé

La région Moyen-Orient, Méditerranée et Afrique (MEMA), qui comprend 68 pays et 20 % de la population mondiale, ne représente que 6 % des essais cliniques enregistrés dans le monde. Cet éditorial identifie huit obstacles majeurs à la recherche clinique dans la région : (1) collaboration limitée avec les universités des pays à revenu élevé (PRE) qui soutiennent la recherche dans les pays à faible revenu (PFR), (2) programmes de formation spécialisée insuffisants, (3) l'insuffisance des infrastructures technologiques et des laboratoires, (4) l'absence d'intégration de la méthodologie de recherche dans les programmes d'études médicales, (5) le sous-développement des comités d'éthique locaux, (6) l'insuffisance et le caractère non durable du financement, (7) le transfert technologique limité des PRE vers les PFR, et (8) la migration des professionnels qualifiés vers les PRE. Ces défis entravent la capacité de recherche et la contribution mondiale de la région. Les solutions proposées comprennent la promotion de partenariats entre les PRE et les PFR, l'amélioration de la formation grâce à des bourses et à des centres de recherche locaux, l'amélioration des infrastructures grâce à la collaboration internationale et le développement de systèmes d'évaluation éthique solides. En s'attaquant à ces obstacles, les PFR peuvent accroître leur contribution à la recherche clinique mondiale, favorisant ainsi l'équité en matière de santé.

Mots clés: Recherche clinique, pays à faible revenu, besoins non satisfaits

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Introduction

The SEVENTH WORLD HEALTH ASSEMBLY (WHA75.8, May 27, 2022) emphasized the need to strengthen clinical trials to generate high-quality evidence for health interventions and improve research coordination (1). Despite this global mandate, low- and middle-income countries (LMICs), particularly in the Middle East, Mediterranean, and Africa (MEMA) region, remain underrepresented in clinical research. The MEMA region, encompassing 68 countries and 20% of the global population, accounts for only 6% of registered clinical trials worldwide (2). Under-enrollment of diverse populations, including older adults, children, women, and LMIC residents, reduces the generalizability of randomized controlled trials (RCTs), exacerbating health disparities (3). This editorial identifies eight key barriers to clinical research in LMICs and proposes actionable solutions to enhance research capacity, aligning with global health priorities.

Barriers to Clinical Research in LMICs

The MEMA region's low contribution to clinical trials stems from systemic challenges that hinder research capacity. These barriers are:

1. Limited Collaboration with High-Income Countries: Few partnerships exist between HIC universities and LMIC institutions to support research development.
2. Insufficient Specialized Training: A lack of advanced training programs in clinical research methodologies limits researcher expertise.
3. Inadequate Infrastructure: Limited access to modern laboratories, technology, and data management systems restricts research capabilities.
4. Underdeveloped Research Curricula: Medical and nursing education often lacks comprehensive training in research methodology, ethics, and biostatistics.
5. Weak Institutional Review Boards (IRBs): Local IRBs require enhanced training to ensure trials meet international ethical standards, such as ICH-GCP (International Council for Harmonisation - Good Clinical Practice) guidelines.
6. Unsustainable Funding: Insufficient and inconsistent financial support hampers the initiation and continuation of clinical trials.
7. Limited Technology Transfer: Inadequate transfer of advanced tools, diagnostic kits, and software from HICs to LMICs limits research innovation.
8. Brain Drain: Migration of skilled professionals to HICs depletes the research talent pool, as evidenced by Tunisia's loss of 438 physicians in 2023.

Proposed Solutions

Addressing these barriers requires multifaceted, evidence-based strategies to build sustainable research capacity in LMICs. The following solutions are proposed:

Foster HIC-LMIC Partnerships

Establishing collaborations between HIC and LMIC institutions can facilitate knowledge exchange, resource sharing, and mentorship. For example, HIC universities could provide training programs, co-develop research protocols, and share infrastructure.

Enhance Training Programs

To address training gaps, LMICs should develop specialized programs, such as fellowships in clinical research or tropical disease studies. A survey in Tunisia revealed that 40% of doctors and 50% of patients were willing to participate in clinical trials, but lack of awareness and training hindered engagement (4). Efforts are being made to carry out randomized clinical trials in LMICs (5,6,7), but these are not sufficient to meet local needs.
Potential solutions include:

- Mentorship for Early-Career Researchers: Support programs to develop research proposals and clinical research skills.
- Scholarships and Fellowships: Offer opportunities for advanced study, either in-person or through e-learning platforms.
- Continuing Professional Development: Provide workshops and seminars to enhance skills in research methodology and ethics.

Strengthen Infrastructure

Limited access to laboratories and technology is a significant barrier. Solutions include:

- HIC-LMIC Partnerships: Collaborate with HIC institutions to address infrastructure deficits, as demonstrated by the African Academy of Sciences' laboratory development initiatives (8,9).
- Local Research Centers: Establish Clinical Investigation Centers (CIC) and Contract Research Organization (CRO).
- NGO and Government Collaboration: Secure funding for IT infrastructure and data management systems.
- Policy Prioritization: Encourage governments to invest in healthcare research infrastructure.

Develop Research Curricula

Integrating research methodology, ethics, and biostatistics into medical and nursing curricula is essential. Solutions include:

- Curriculum Reform: Develop e-learning platforms for research training, as piloted by the WHO's TDR program (10).
- Government Support: Establish national research agendas with incentives for local initiatives.
- International Funding: Engage global agencies like the European Research Council for grants.
- Public-Private Partnerships: Collaborate with industry to fund curriculum development.

Build Ethical Review Capacity

Strengthening local IRBs ensures trials meet international standards. Training programs should focus on ICH-GCP guidelines and ethical considerations specific to LMIC contexts, such as informed consent in low-literacy populations.

Secure Sustainable Funding

Financial constraints limit research sustainability. Solutions include:

- Regional Funding Mechanisms: Leverage organizations like the African Academy of Sciences or the Indian Alliance for grants.
- Global Visibility: Increase LMIC researchers' exposure through local conferences and networking events.
- Innovative Financing: Explore novel funding models, such as redirecting a portion of pharmaceutical marketing budgets to research.

Promote Technology Transfer

Encouraging technology transfer from HICs to LMICs can enhance research capabilities. For example, Obayemi et al. highlighted the need for simulation-based surgical training in Africa to address local disease burdens (11). Solutions include:

- Private Sector Partnerships: Collaborate with companies to provide diagnostic tools and software tailored to LMIC settings.
- Research Hubs: Establish technology hubs to support local researchers, as piloted in East Africa (12). Efforts are being made in this direction (13), but we need to go further.

Retain Talent

Preventing brain drain requires attractive career paths. Solutions include:

- Research Communities: Foster local research networks with competitive remuneration and long-term career development.
- Policy Incentives: Governments and NGOs should offer scholarships and academic positions to retain talent, as demonstrated by successful retention programs in South Africa (14).

Conclusion

The underrepresentation of LMICs in clinical research, particularly in the MEMA region, reflects systemic barriers that perpetuate health inequities. By fostering HIC-LMIC partnerships, enhancing training, strengthening infrastructure, and addressing ethical and funding challenges, LMICs can transition from research consumers to producers. Policymakers, funders, and researchers must prioritize these solutions to ensure equitable participation in global health research, ultimately improving health outcomes for LMIC populations.

Aknowlegement

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