

1 **Title:**

2 Global Surgery Research: An Overview and the Role of Medical Students and Surgical Trainees in Advancing Global
3 Surgery Research in LMICs

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5 Letter

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16 improve access to sustainable, safe, and affordable surgical care in low- and middle-income countries through
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10 **Discussion Points:**

11 1. What is global surgery research, and why is it important in low- and middle-income countries (LMICs)?
12 #GlobalSurgery #LMICs #MedicalStudents

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15 2. What are the key research priorities in global surgery? #SurgicalDisease #AccessToCare #Innovation
16 #HealthSystems

17

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19 3. How can medical students and surgical trainees contribute to global surgery research in LMICs?
20 #ResearchProjects #Collaboration #LiteratureReviews #DataCollection #Dissemination

21

22

23 4. What challenges and opportunities exist for medical students and surgical trainees in global surgery research?
24 #LimitedResources #CulturalDifferences #LanguageBarriers

25

26

27 5. What strategies can be employed to promote global surgery research in LMICs, and how can medical students
28 and surgical trainees be supported in their contributions to this field? #PatientHealth #SkillsDevelopment
29 #ResearchExperience #Opportunities

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28 **Abstract:**

29 Global surgery research is a critical area of study aimed at enhancing access to safe and effective surgical care for
30 patients in low- and middle-income countries (LMICs). It is essential to explore the significance of global surgery
31 research and highlight the potential contributions of medical students and surgical trainees in addressing the pressing
32 needs of LMIC populations. Global surgery research is pivotal in driving progress and fostering innovation by
33 evaluating surgical disease burden, identifying access barriers, developing sustainable solutions, and strengthening
34 health systems. Additionally, integrating sustainability principles into global surgery research endeavors ensures
35 surgical interventions benefit patients while minimizing the environmental impact of surgical care delivery. Medical
36 students and surgical trainees can engage in global surgery research, including collaborating with experienced
37 researchers, developing research projects with local partners, conducting literature reviews, collecting and analyzing
38 data, and disseminating research findings. Despite challenges faced in conducting research in LMIC, such as limited
39 resources and sociopolitical instability, opportunities exist to nurture the interest of medical students and surgical

1 trainees in global surgery research. By actively participating in global surgery research, medical students and surgical
2 trainees can contribute to improving healthcare outcomes in LMICs while honing invaluable research skills for their
3 future careers.

4 **Key Words:** Developing countries, Global Surgery, Medical Students, Research, Surgical Trainees

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1 **Manuscript:**

2 *The Importance of Global Surgery Research:*

3 Global surgery research systematically investigates various facets of surgical care delivery, access, outcomes, and
 4 innovative solutions specifically tailored to low- and middle-income countries (LMICs) and disaster areas. Its scope
 5 involves in-depth examinations of the burden of surgical diseases, identification of barriers impeding access to care,
 6 development of sustainable strategies, evaluation of health systems, and promotion of equitable and effective surgical
 7 interventions.¹ By addressing the substantial burden of surgical diseases borne by LMICs, despite their limited
 8 healthcare workforce and infrastructural capacities, global surgery research plays a pivotal role in enhancing surgical
 9 care and outcomes in these regions.^{2,3} It achieves this by identifying key challenges, proposing innovative solutions,
 10 evaluating intervention effectiveness, addressing region-specific hurdles, and advancing global health equity.⁴ Given
 11 the unfortunate negative impact of surgical care on the environment, sustainability is at the core of global surgery
 12 research. Sustainable surgical care ensures that interventions benefit patients, minimize negative environmental
 13 impacts, and support long-term viability.⁵ Medical students and surgical trainees can significantly contribute to global
 14 surgery research, helping address the pressing needs of LMIC populations,^{6,7} hence, it is imperative to provide an
 15 overview of global surgery research and explore the avenues through which medical students and surgical trainees
 16 can make meaningful contributions to this critical field.

17 *Research Priorities in Global Surgery:*

18 Global surgery research is pivotal in driving progress and fostering innovation in healthcare, particularly within
 19 LMICs.⁴ Research priorities form the foundational pillars upon which transformative advancements are built, paving
 20 the way for surgical care improvements and equitable health outcomes. Core areas of inquiry help generate evidence-
 21 based insights and strategic interventions that address the unique challenges LMICs face in global surgery. Some key
 22 research priorities in global surgery include the following:

- 23 • Assessing surgical disease burden in LMICs, including incidence, prevalence, and environmental impact of
 24 surgical care.
- 25 • Identifying barriers to accessing surgical care: financial, geographic, and cultural factors.
- 26 • Developing sustainable solutions to overcome barriers to accessible surgical care.
- 27 • Strengthening health systems and improving surgical care delivery in LMICs with sustainable practices.
- 28 • Evaluating the impact of surgical education and training programs in LMICs, enhancing sustainability
 29 education.
- 30 • Developing low-cost, high-impact surgical innovations aligned with sustainability for LMICs.

31 *Medical Students and Surgical Trainees Can Contribute to Global Surgery Research:*

32 Medical students and surgical trainees in LMICs can make valuable contributions to global surgery research, despite
 33 being early in their careers. Some ways in which they can get involved include:

1 1. Participating in research projects led by experienced researchers in global surgery:

2 Collaborating with seasoned researchers allows students to gain hands-on experience and contribute to ongoing studies
3 in the field. Medical students and trainees can seek opportunities to collaborate with established researchers who are
4 already leading projects in the field of global surgery. Seasoned researchers could benefit from involving medical
5 students in research by gaining fresh perspectives, increasing productivity through task delegation, facilitating
6 knowledge transfer and mentorship opportunities, and expanding their professional network.

7 2. Developing their research projects in collaboration with local partners in LMICs:

8 Working closely with local partners fosters a deeper understanding of the specific healthcare challenges and needs in
9 LMICs, leading to impactful research initiatives. Students can connect with local healthcare professionals, institutions,
10 or non-governmental organizations (NGOs) in LMICs to identify research areas of mutual interest. Collaborating with
11 local partners ensures the research aligns with the specific needs and priorities of the LMICs, increasing its relevance
12 and impact.

13 3. Conducting literature reviews and meta-analyses to synthesize existing research in global surgery:

14 By reviewing existing research in global surgery, students can synthesize and analyze available information,
15 identifying knowledge gaps and potential areas for further investigation. Medical students and trainees can undertake
16 comprehensive reviews of existing literature related to global surgery. They can summarize and analyze the findings
17 from multiple studies, identify gaps in knowledge, and propose research questions or areas that require further
18 investigation.

19 4. Collecting and analyzing data in LMICs, for example, by conducting surveys or interviews with patients and
20 healthcare providers:

21 Students can engage in primary data collection by conducting surveys or interviews with patients and healthcare
22 providers, helping to generate new insights and evidence. Once the data is collected, students can assist with data
23 analysis, interpretation, and drawing meaningful conclusions.

24 5. Disseminating research findings through academic publications, conference presentations, and social media:

25 Sharing research outcomes through academic publications, conference presentations, and social media platforms raises
26 awareness, promotes collaboration, and contributes to the broader global surgery community.

27 *Challenges and Opportunities:*

28 Global surgery research in LMICs face several challenges, including limited human, infrastructural and financial
29 resources, sociopolitical instability, language and cultural barriers, and inadequate political engagement. Medical
30 students and surgical trainees must be mindful of these challenges and work collaboratively with local partners to
31 overcome them and mitigate their impact.

1 Medical students and surgical trainees are presented with unique opportunities to contribute significantly to the field
2 of global surgery research. These opportunities are facilitated through various global surgery interest groups, such as
3 the Association of Future African Neurosurgeons (AFAN), the International Student Surgical Network (InciSioN),
4 the Association of Future African Cardiothoracic surgeons (AFAC), the African Research Society (ARS), and the
5 Evidence-Based Scientific Consortium (EBASC), among others. These interest groups serve as platforms for medical
6 students and surgical trainees in LMICs to cultivate their interest in global surgery research and foster the development
7 of indispensable skills and experiences essential for their future careers and contributions to the field of global surgery.
8 Additionally, numerous institutions within LMICs and the African continent offer research fellowships specifically
9 dedicated to global surgery.⁸ By engaging in these research fellowships, medical students and surgical trainees can
10 actively participate in hands-on global surgery projects, while simultaneously expanding their knowledge and
11 expertise in the realm of global surgery research.

12 *Conclusion:*

13 Global surgery research is an important area of study that aims to improve access to safe and effective surgical care
14 for patients in LMICs. Medical students and surgical trainees can contribute by participating in research projects,
15 collaborating with local partners, conducting literature reviews, collecting data, and disseminating findings. Despite
16 challenges, there are opportunities to make a positive impact and develop valuable skills. Their involvement is
17 essential for addressing healthcare disparities and promoting sustainable and equitable access to surgical care.

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